On the nature of ATB-movement

Insights from reflexes of movement

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ATB-construction

- Ross (1967): coordination island effects can be circumvented by across-the-board (ATB) movement, see (1):

  (1) What$_{1,2}$ does [$_{\mathrm{TP}}$ John like t$_1$] and [$_{\mathrm{TP}}$ Mary hate t$_2$] ?

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- ATB: has many interesting properties (see a.o. Moltmann 1992; Munn 1993; Franks 1993; 1995; Nunes 2004; Citko 2005; Salzmann 2012*a*; de Vries to appear)
  today: **one-to-many relation between antecedent and gaps**

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  today: **one-to-many relation between antecedent and gaps**
- **two types of approaches** to this mismatch:
  - symmetric approach: symmetric extraction from all conjuncts
  - asymmetric approach: asymm. extraction from one of the conjuncts
- little empirical evidence for/against the approaches

Goals

- to provide a **new diagnostic tool** that allows us to distinguish between symmetric and asymmetric approaches: **asymmetric reflexes of movement**
- to show that existing approaches to ATB make different **predictions about the distribution of these reflexes inside the conjuncts under long-distance ATB-movement**
- to present **empirical evidence** from 4 Niger-Congo languages that argues **for asymmetric extraction from the first conjunct**

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- question: why do we see only a single wh-XP in the terminal landing site?

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  - **fusion** of the extractees in the landing site (by a construction-specific rule, cf. Ross 1967; Williams 1978, or by feature intersection, cf. Hein and Murphy 2016, see also HPSG slash feature percolation from each conjunct, Pollard and Sag 1994; Levine et al. 2001)

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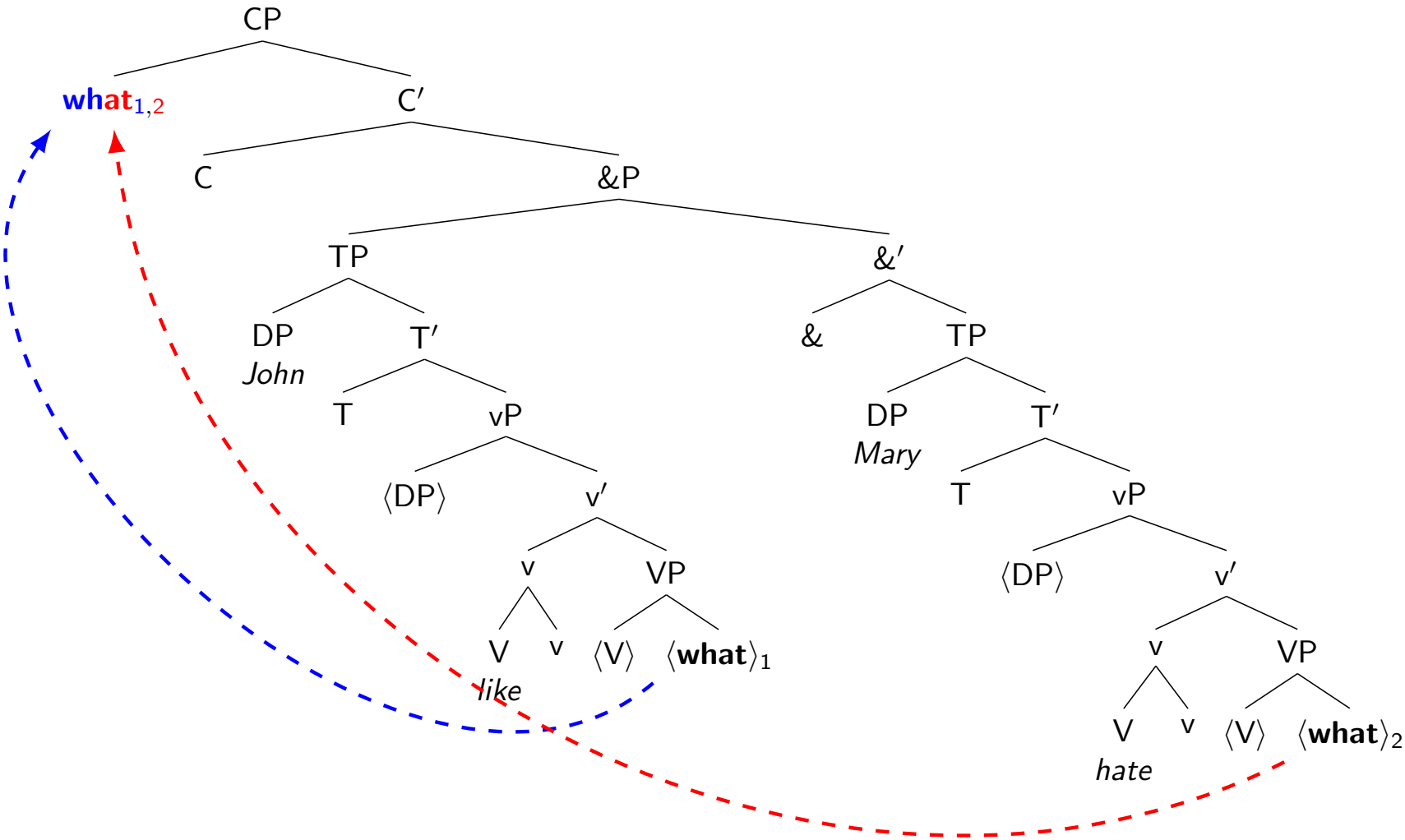
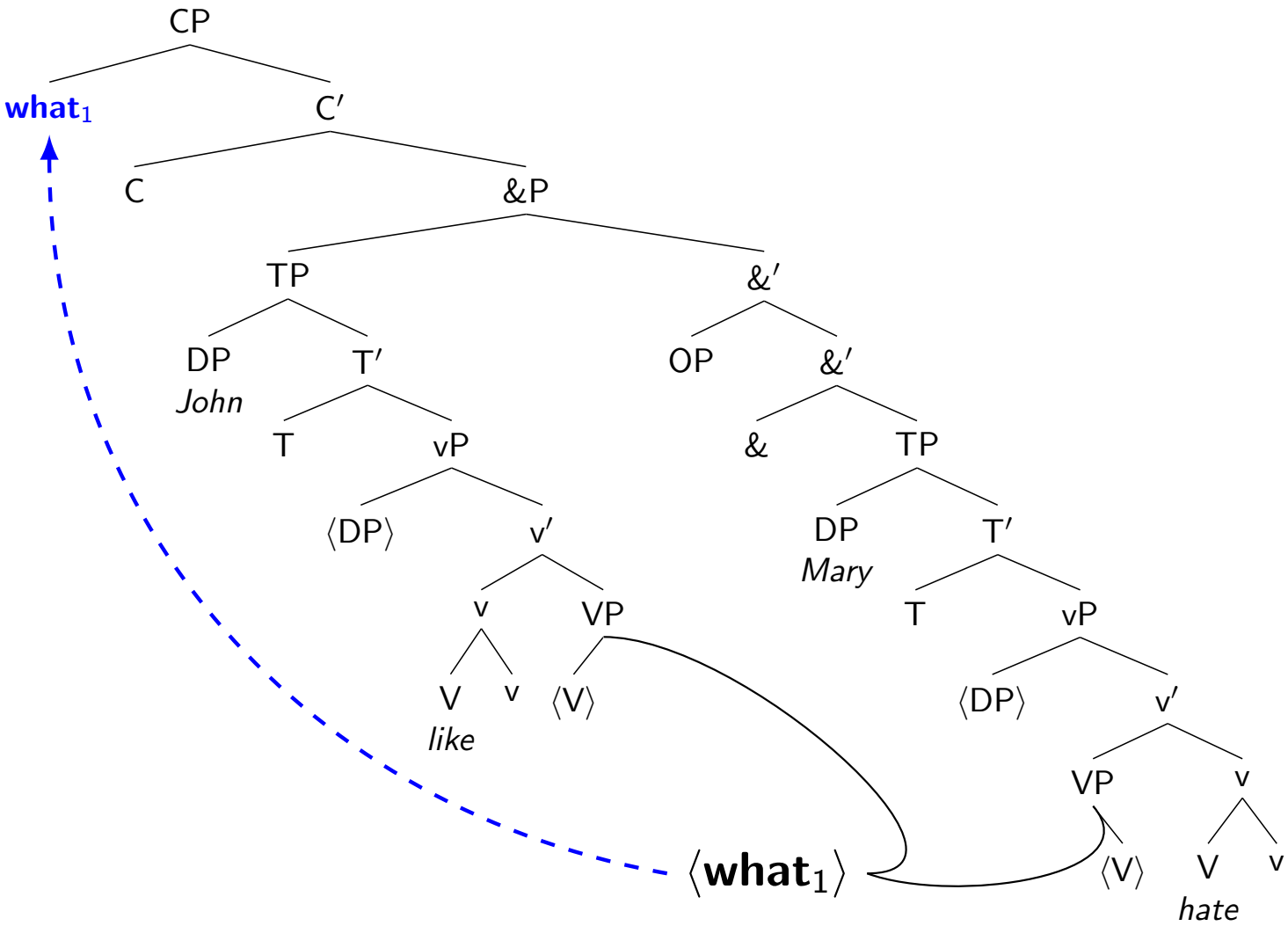
  - **sharing/multi-dominance**: There is only a single wh-XP in the first place, it is shared between the conjuncts (Williams 1978; Goodall 1987; Moltmann 1992; Citko 2005; Gračanin-Yüksek 2007; 2013; Bachrach and Katzir 2009)

Symmetric approaches 1: fusion



Symmetric approaches 2: sharing/multi-dominance



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- assumption: extraction takes place from only one of the conjuncts, either from the 1st or from the 2nd conjunct
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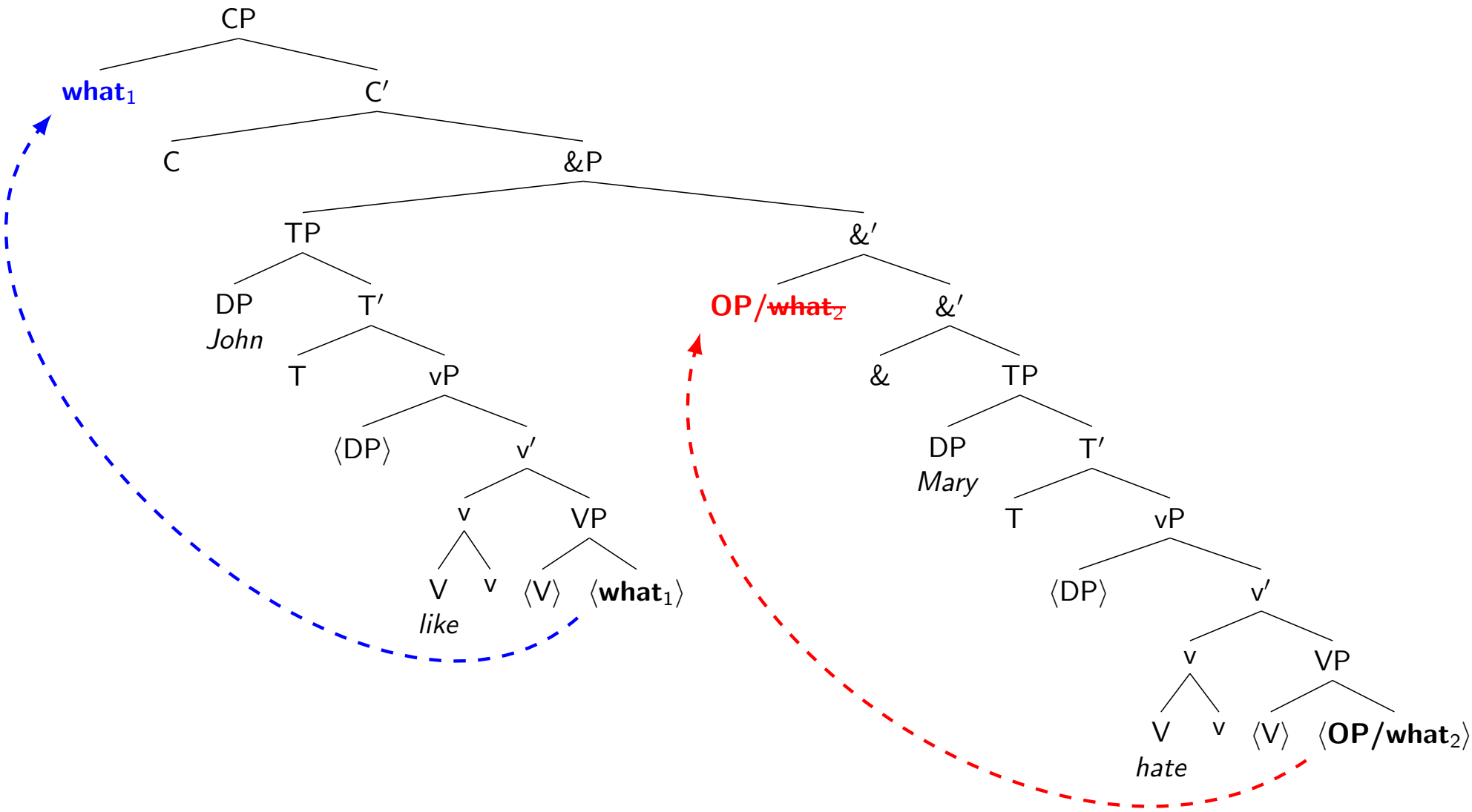
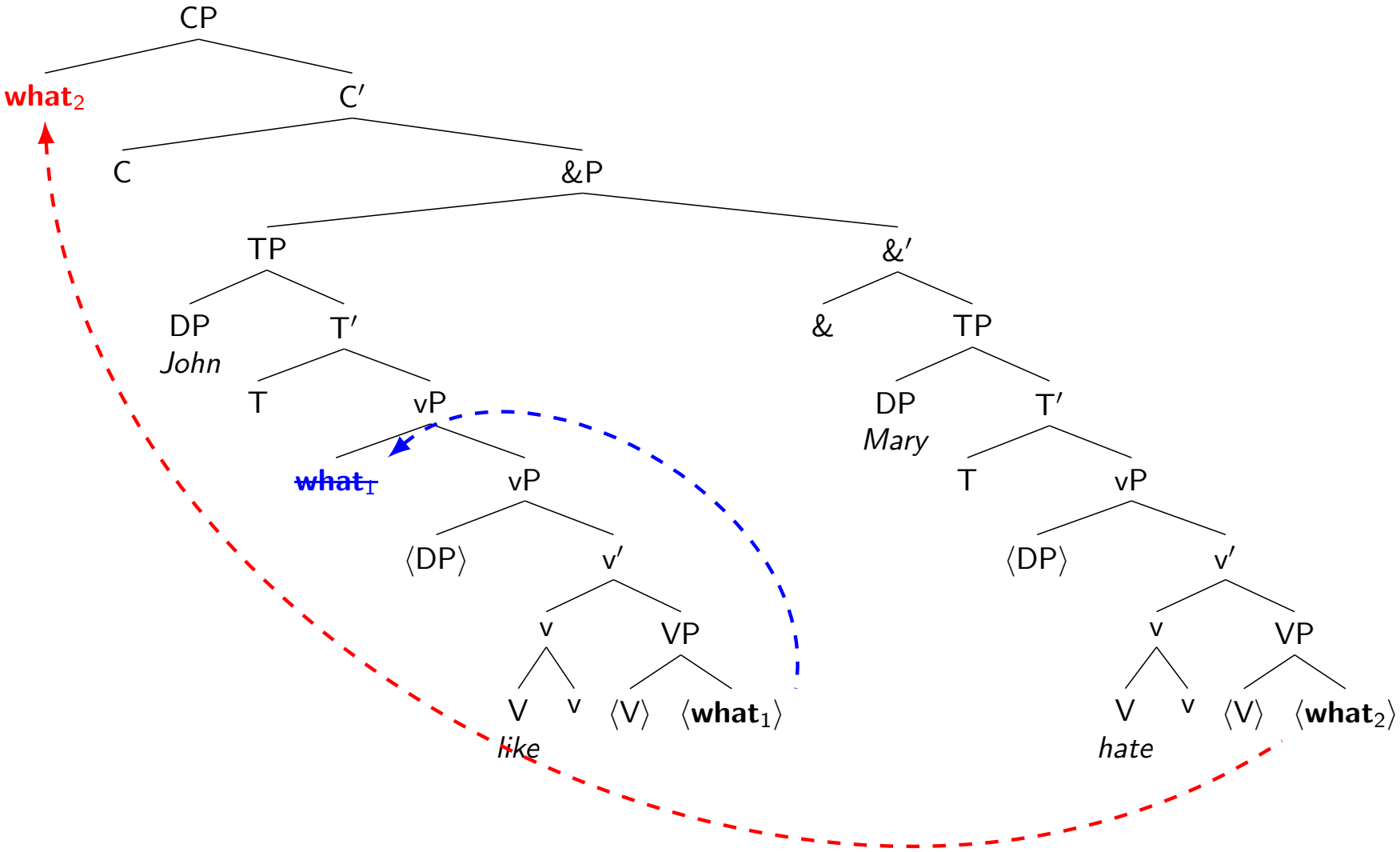
- question: why do we also see gaps in the other conjuncts?
- answers:
  - **parasitic gap approach**: asym. extraction from Conj1 + movement of an **empty operator** (OP) inside the other conjunct(s), cf. Munn (1992; 1993); Franks (1992; 1995); Bošković and Franks (2000)
  - **ellipsis**: The wh-XP that moves inside the other conjunct(s) is elided under identity with the extracted wh-XP, cf. Salzmann (2012*a*) for ellipsis in Conj2, and Ha (2008) for ellipsis in Conj1

Asymmetric approaches 1: pg-approach / ellipsis in Conj2

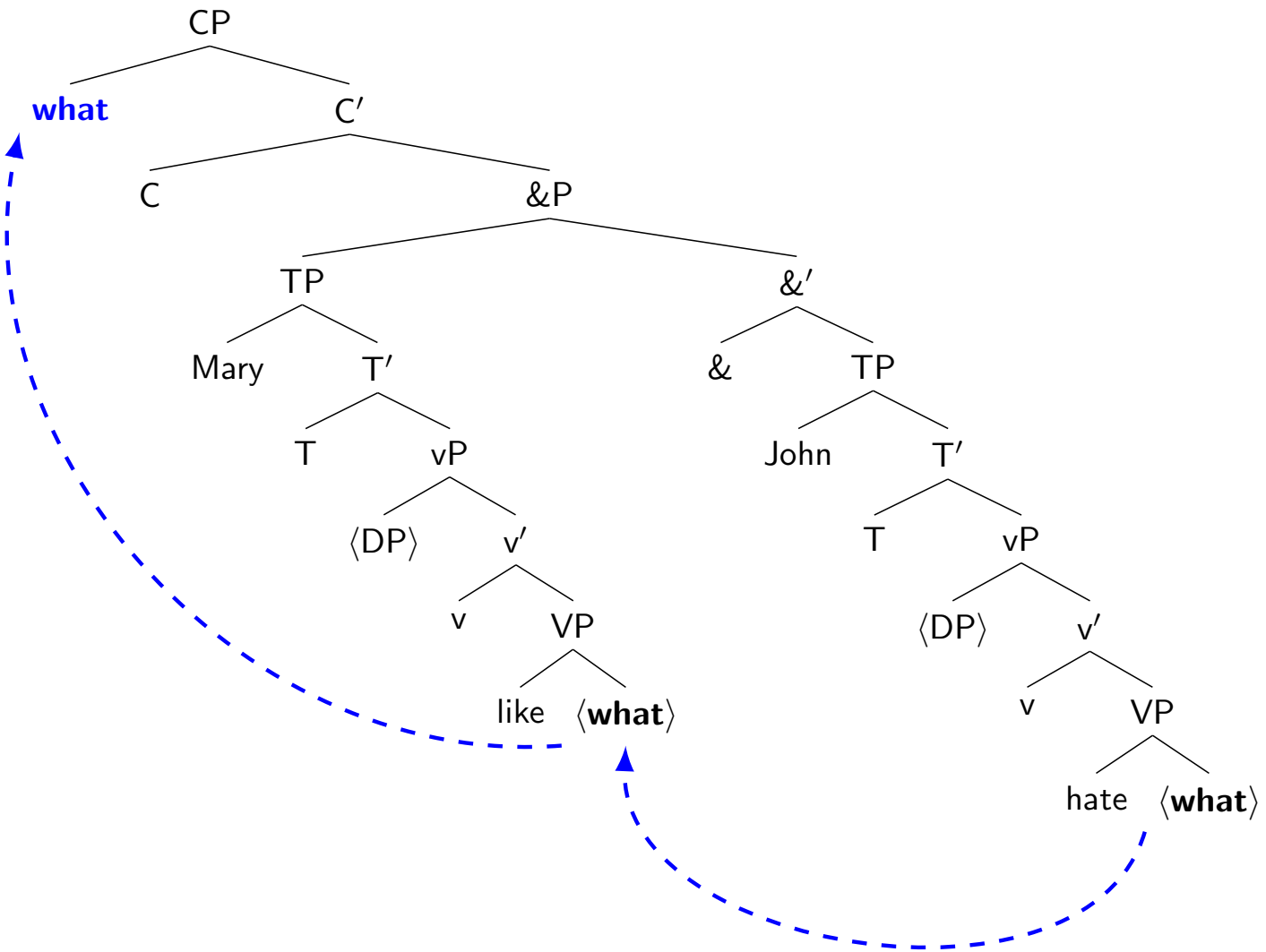


Asymmetric approaches 2: ellipsis in Conj1



A mixed approach: sideward movement (Nunes 2004)

- The sole wh-XP in the structure moves from Conj2 into Conj1 and from there to its scope position.



Empirical evidence?

- evidence for asym. extraction from Conj1: asymm. reconstruction into Conj1 for weak crossover & Principles A+C in English/German, Munn 1993; 2001; Moltmann 1992; Fox 2000; Nissenbaum 2000; Citko 2005; Salzmann 2012*b*):

(2) Asymmetric reconstruction for Principle A (Munn 1993: 52):

a. [Which picture of himself$_i$] did [John$_i$ buy] and [Mary paint]?
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- more empirical evidence is needed (from different domains), here: inflection

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1. long-distance ATB-movement, CP-coordination

   (3) **What** do you think [$_{\&P}$ [$_{CP}$ that M. likes t] & [$_{CP}$ that J. hates t]]]

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   (see Chomsky 1973 et seq., recent overviews: Abels 2012; van Urk 2015):

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(5) Type of movement step to SpecC in MC, Conj1, Conj2:

approach	MC	Conj1	Conj2
symmetric	terminal	intermed.	intermed.
asym. extr. from Conj1	terminal	intermed.	terminal
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Empirical evidence: reflexes of movement

- **idea**: We can make the type of movement step to the edge of the CP-conjuncts visible in languages that exhibit a morphol. distinction between terminal and intermed. movement steps along the path of Ā-movement.
- **phenomenon**: morphol. reflexes of movement (Boeckx 2008; Lahne 2008; Abels 2012; Zentz 2013; Georgi 2014); languages differ in how the reflex is distributed across the clauses (Georgi 2017):

a. the reflex occurs in every CP (e.g. Irish compl.-selection, McCloskey 2001)

(6) $[_{\mathrm{CP}_1}\ \mathrm{XP}_{\mathrm{wh}}\ [_{\mathrm{C}'_1}\ \mathbf{C}_1\text{-}\mathbf{R}\ \ldots\ [_{\mathrm{CP}_2}\ \ldots\ \mathbf{C}_2\text{-}\mathbf{R}\ \ldots\ [_{\mathrm{CP}_3}\ \ldots\ \mathbf{C}_3\text{-}\mathbf{R}\ \ldots\ \_\_\mathrm{XP}\ ]]]]$

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b. the reflex occurs only in the terminal clause of the Ā-dependency

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(8) $[_{\mathrm{CP}_1}\ \mathrm{XP}_{\mathrm{wh}}\ [_{\mathrm{C}'_1}\ \mathrm{C}\ \ldots\ [_{\mathrm{CP}_2}\ \ldots\ \mathbf{C_2\text{-}R}\ \ldots\ [_{\mathrm{CP}_3}\ \ldots\ \mathbf{C_3\text{-}R}\ \ldots\ \_\_\mathrm{XP}\ ]]]]$

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- relevant in what follows: asymmetric patterns in b. and c.

Predictions of the ATB-approaches

(9) Patterns of reflex forms (terminal vs. intermed. for each CP):

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- Outlook: The empirical findings are in line with the predictions of the approach that postulates **asym. extraction from Conj1** (the terminal reflex form occurs in the MC and in Conj2, but not in Conj1).

Overview

Reflexes of movement: overview

language	spoken in	reflex	reflex indicates
Duala	Cameroon	post-verbal particle *nó-*	terminal step
Bùlì	Ghana	form of C	terminal step
Ewe	Ghana	form of the 3sg SU pronoun	terminal step
Kiitharaka	Kenia	pre-verbal marker *n-*	intermed. step

Reflex of movement in Duala

- sources: Epée (1975; 1976*b*;*a*); Biloa (1993); Kengne Cenny (2015; 2018)
- reflex: if a non-subject undergoes Ā-movement (wh-/foc-movement, relativization), the particle **no**- must occur after the finite verb, (10-b)
- long Ā-movement: the particle surfaces only in the terminal clause, (10-c)

(10) Focus movement in Duala (Epée 1976*b*: 194, 196):

a. Kuo a bodi nu moto kalati kiele
Kuo 3SG give that man book yesterday
"Kuo gave a book to that man yesterday." *declarative*

b. kalati$_k$ nde Kuo a bodi **no** nu moto __$_k$ kiele
book FOC Kuo 3SG give NO that man yesterday
"It's a book Kuo gave to that man yesterday." *DO mvt.*

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c. [$_{CP}$ ni kalati$_k$ nde na ta **no** na kwalane Kuo [$_{CP}$ na
that book FOC I PST NO I tell Kuo that
a-angamente **(*no)** wana __$_k$]]
3SG-must NO bring
"That's the book I told Kuo that he should bring." *long DO mvt.*

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- terminal movement step indicated by *no*
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which child father SM like-NO and mother SM hate-NO

"Which child does father like and mother hate?"

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which child 2SG PRES-think-NO that father SM like and that mother
á síŋgɛ́ɛ̄-**nɔ́**
SM hate-NO

"Which child do you think that father likes and that mother hates?"

▶ any other distribution of the particle across the verbs is ungrammatical!

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result: (MC = Conj2)$_{no}$ ≠ Conj1 → asymmetric extraction from Conj1

Reflex of movement in Bùlì

- sources: Ferreira and Ko (2003); Hiraiwa (2003; 2005*a*;*b*); Sulemana (2014)
- reflex: form of C is sensitive to Ā-movement; default (decl. form) = **àyīn**, Ā-movement form (non-SU movement) = **àtì**

(13) C-form in Bùlì (Hiraiwa 2005*a*: 293, Sulemana 2014: 2):

a. Àtìm wēːnī **àyín** Àmòak dà mángò-kú
Atim say.PST C Amoak buy.PST mango-DEF
"Atim said that Amoak bought the mango." *embedded decl.*

b. ká b^{w}a **ātí** bíːká dìgìː
Q what C child.DEF cook.PST
'What did the child cook?" *DO-question*

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Q what C child.DEF cook.PST
'What did the child cook?" *DO-question*

- long Ā-movement: special C-form occurs only in the terminal clause, intermediate clauses are introduced by the default C-form

(14) ká bʷa **àtì** fí wéːní **āyīn** bíːká dìgìː
Q what C 2SG say.PST C child.DEF cook.PST
"What did you say the child cooked ?" *long DO-qu., Sulemana (2014: 21)*

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- informants: Abdul-Razak Sulemana (MIT), George Akanlig-Pare (Univ. of Ghana)

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Q what that Amoak bought and Atim ate

"What did Amoak buy and Atim eat?" *DO-Q*

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"What did Amoak buy and Atim eat?" *DO-Q*

(16) **long ATB: reflex in MC + Conj2**

ká bwà **àtì** núrú-wú we꞉nı **àyīn** Àmòak dà **àtì** Àtìm dɛ
Q what that man-DEF said that Amoak bought that Atim ate
"What did the man say that Amoak bought and that Atim ate?" *DO-Q*

▶ any other distribution of C-forms is ungrammatical
result: (MC = Conj2)$_{ati}$ ≠ Conj1 → asymmetric extraction from Conj1

Reflex of movement in Ewe

- sources: Collins (1993), informants: Princess Korsah, Elvis Yevudey
- reflex: 3sg subject pronoun = *é* in declaratives; changes to **wò** under Ā-movement (wh-/foc-movement, relativization)
- long Ā-movement: the change to *wò* is obligatory in the terminal clause, and optional in intermediate clauses

(17) *3sg pro in Ewe (Collins 1993: 157, 177f., Georgi 2017: 604f.)*:

a. [**é**/*wò] fo Kɔsi
   he hit Kɔsi
   "He hit Kɔsi." *decl.*

b. [$_{CP}$ Kofi biɛ [$_{CP}$ be lamata$_k$ [*é/**wò**] fo Kɔsi $\_\__k$]]
   Kofi asked C why he hit Kɔsi
   "Kofi asked why he hit Kɔsi." *emb. question*

Reflex of movement in Ewe

- sources: Collins (1993), informants: Princess Korsah, Elvis Yevudey
- reflex: 3sg subject pronoun = *é* in declaratives; changes to **wò** under Ā-movement (wh-/foc-movement, relativization)
- long Ā-movement: the change to *wò* is obligatory in the terminal clause, and optional in intermediate clauses

(17) *3sg pro in Ewe (Collins 1993: 157, 177f., Georgi 2017: 604f.)*:

a. [**é**/*wò] fo Kɔsi
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   Kofi asked C why he hit Kɔsi
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c. [$_{CP}$ Meka-e$_k$ **wò**/*é gblɔ [$_{CP}$ be **wò/é**-bu [$_{CP}$ be **wò/é**-fò __$_k$]]]
   who-FOC he say that he-think that he-hit
   "Who did he$_i$ say that he$_j$ thinks that he$_m$ hit?" *long DO-mvt.*

ATB in Ewe

- terminal movement step indicated by *wò* (oblig)
- informants: Kofi Dorvlo (Univ. of Ghana), Ken Adevu (Dep. of Languages OLA Senior High School, Ho), Edem Dande (Senior High, Agbozume), Princess Korsah

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(18) **short ATB: reflex preferred in both conjuncts**

a. Nu-ká Yao tu eye Kofi fle
thing-Q Yao build and Kofi buy
"What did Kofi buy and John build?"

b. Nu-ká **??é/wò** tu eye Kofi fle
thing-Q 3SG.SU build and Kofi buy
"What did he buy and John build?" *3sg pron. in Conj1*

c. Nu-ká Yao tu eye **??é/wò** fle
thing-Q Yao build and 3SG.SU buy
"What did Kofi buy and he build?" *3sg pron. in Conj2*

ATB in Ewe

(19) **long ATB: reflex in MC + Conj2**:

a. Nu-ká Kosi bu be Yao tú eye Kofi fle
thing-Q Kosi think that Yao build and Kofi buy
"What does Kosi think that Kofi built and Yao bought?"

ATB in Ewe

(19) **long ATB: reflex in MC + Conj2**:

a. Nu-ká Kosi bu be Yao tú eye Kofi fle
thing-Q Kosi think that Yao build and Kofi buy
"What does Kosi think that Kofi built and Yao bought?"

b. Nu-ká ***é/wò**-bu be Yao tu eye Kofi fle
thing-Q 3SG.SU-think that Yao build and Kofi buy
"What does he think that Yao built and (that) Kofi bought?" *MC*

c. Nu-ká Kosi bu be **é/wò**-tú eye ne-fle
thing-Q Kosi think that 3SG.SU-build and 2SG.SU buy
"What does Kosi think that he built and (that) you bought?" *Conj1*

d. Nu-ká Kosi bu be Yao tu eye ***é/wò**-fle
thing-Q Kosi think that Yao build and 3SG.SU bought
"What does Kosi think that Yao built and that he bought?" *Conj2*

ATB in Ewe

(19) **long ATB: reflex in MC + Conj2**:

a. Nu-ká Kosi bu be Yao tú eye Kofi fle
thing-Q Kosi think that Yao build and Kofi buy
"What does Kosi think that Kofi built and Yao bought?"

b. Nu-ká ***é/wò**-bu be Yao tu eye Kofi fle
thing-Q 3SG.SU-think that Yao build and Kofi buy
"What does he think that Yao built and (that) Kofi bought?" *MC*

c. Nu-ká Kosi bu be **é/wò**-tú eye ne-fle
thing-Q Kosi think that 3SG.SU-build and 2SG.SU buy
"What does Kosi think that he built and (that) you bought?" *Conj1*

d. Nu-ká Kosi bu be Yao tu eye ***é/wò**-fle
thing-Q Kosi think that Yao build and 3SG.SU bought
"What does Kosi think that Yao built and that he bought?" *Conj2*

result: (MC = Conj2)$_{wo}$ $\neq$ Conj1 $\rightarrow$ asymmetric extraction from Conj1

Reflex of movement in Kiitharaka

- sources: Harford (1997); Muriungi (2005; 2011); Abels and Muriungi (2008)
- reflex: pre-verbal marker **n-** surfaces, but only in intermediate CPs

(20) *Short wh-movement (Abels and Muriungi 2008: 692, Muriungi 2005: 45)*:

a. Maria a-gur-ir-e i-buku
Maria SM-buy-PERF-FV 5-book
"Maria bought a book." *declarative*

b. I-mbi$_k$ Maria a-k-ir-e __$_k$
FOC-what Maria SM-build-PERF-FV
"What did Maria build?" *DO-question*

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"What did Maria build?" *DO-question*

(21) *Long wh-movement (Muriungi 2005: 47-48, 67-68)*:

[$_{CP}$ N-uu$_k$ u-ku-thugania [$_{CP}$ ati John **n**-a-ug-ir-e [$_{CP}$
FOC-who 2SG-PRES-think that John N-SM-say-PERF-FV
Lucy **n**-a-ring-ir-e __$_k$]]]
Lucy N-SM-beat-PERF-FV
"Who do you think that John said Lucy beat?" *long DO-question*

ATB in Kiitharaka

- intermediate movement step indicated by pre-verbal *n-*
- informants: Lydia Ruguru (Kenyatta University, Kenya), Purity Isumbi, Rufo Kiria, Doreen Muthoni, Martin Gwatia, Eric Mutumiria (University of Embu, Kenya)

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(22) **short ATB: no reflex in any conjunct**

i-mbi Maria **Ø**-a-gur-a noe John **Ø**-a-rebur-a
FOC-what Maria Ø-SM-buy-FV and John Ø-SM-break-FV
"What did Maria buy and John break?"

ATB in Kiitharaka

- intermediate movement step indicated by pre-verbal *n-*
- informants: Lydia Ruguru (Kenyatta University, Kenya), Purity Isumbi, Rufo Kiria, Doreen Muthoni, Martin Gwatia, Eric Mutumiria (University of Embu, Kenya)

(22) **short ATB: no reflex in any conjunct**

i-mbi Maria **Ø**-a-gur-a noe John **Ø**-a-rebur-a
FOC-what Maria Ø-SM-buy-FV and John Ø-SM-break-FV
"What did Maria buy and John break?"

(23) **long ATB: intermed. reflex in Conj1**

i-mbi mfana **Ø**-a-thugani-a ati Maria **n**-a-gur-ir-e noe
FOC-what Mfana Ø-SM-think-FV that Maria N-SM-buy-PERF-FV and
John **Ø**-a-rebur-a
John Ø-SM-broke-FV
"What does Mfana think that Maria bought and that John broke?"

result: (MC = Conj2) $\neq$ Conj1$_n$ $\rightarrow$ asymmetric extraction from Conj1

Results

In each of the 4 languages....

- short ATB: form that indicates terminal movement step in both conjuncts
- long ATB: $(\text{MC} = \text{Conj2})_{terminal} \neq \text{Conj1}_{intermed}$.

$\Rightarrow$ evidence for asymmetric extraction from Conj1

Results

In each of the 4 languages....

- short ATB: form that indicates terminal movement step in both conjuncts
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$\Rightarrow$ evidence for asymmetric extraction from Conj1

How can we explain the different distribution of reflexes across the two conjuncts in short vs. long ATB questions?

Short vs. long ATB-movement

Idea: clause-bound upward Agree

The reflex-hosting head (C, T) agrees upwards with the (copy of the) operator in the minimal SpecC and checks whether this OP is in its terminal or in an intermediate landing site (see among others Nunes 2004; Chomsky 2000; 2001; Sabel 2000; Heck and Müller 2003; Bošković 2007 for such a distinction)

Short vs. long ATB-movement

Idea: clause-bound upward Agree
The reflex-hosting head (C, T) agrees upwards with the (copy of the) operator in the minimal SpecC and checks whether this OP is in its terminal or in an intermediate landing site (see among others Nunes 2004; Chomsky 2000; 2001; Sabel 2000; Heck and Müller 2003; Bošković 2007 for such a distinction)

- short ATB-movement (C′ or TP-coordination):
  The closest SpecC for the C/T heads in Conj1 and Conj2 = the sole SpecC that hosts wh-XP in its terminal position ⇒ TR in both conjuncts

terminal

(24) $[_{\mathrm{CP}}$ **wh-XP** $[_{\mathrm{C'}}$ C $[_{\&\mathrm{P}}$ $[_{\mathrm{TP}_1}$ **T**$_1$ … t$_{wh}$ … $[_{\&'}$ $[_{\mathrm{TP}_1}$ **T**$_2$ …]]]]]]

terminal

Short vs. long ATB

- long ATB-movement (CP-coordination):
  - **matrix** C/T/v: minimal SpecC = matrix SpecC with wh-XP in its terminal position ⇒ TR
  - Conj1 C/T/v: minimal SpecC = Conj1-SpecC with a copy of wh-XP in its intermed. landing site ⇒ IR
  - Conj2 C/T/v: minimal SpecC = Conj2-SpecC with OP in its terminal position ⇒ TR

(25) $[_{\mathrm{CP}}$ **wh-XP** $[_{\mathrm{C'}}$ C $[_{\mathrm{TP}}$ **T** ... $[_{\mathrm{VP}}$ V $[_{\&\mathrm{P}}$ $[_{\mathrm{CP}_1}$ **t′** $[_{\mathrm{C}'_1}$ C_1 $[_{\mathrm{TP}_1}$ $\mathbf{T}_1$ ... t]]]
$[_{\&'}$ $[_{\mathrm{CP}_2}$ **OP** $[_{\mathrm{C}'_2}$ C_2 $[_{\mathrm{TP}_2}$ $\mathbf{T}_2$ ... t]]]]]]]]]

terminal

terminal

intermed.

Conclusion

- new diagnostic tool that allows us to distinguish between symmetric and asymmetric approaches to ATB-movement: asymmetric reflexes of movement (morph. difference between terminal / intermed. movement steps)
- asym. and symmetric approaches make different predictions about the distribution of these reflexes across CP-conjuncts under long-distance ATB-movement
- the findings from 4 Niger-Congo languages provide evidence for asymmetric extraction from Conj1
- the asymmetry between short and long ATB-movement: can be modeled by a locality restriction on upward Agree

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