On the nature of ATB-movement: insights from reflexes of movement*

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1 Introduction

Ross (1967) observed that coordinations are islands for subextraction, see (1a), but also that they become transparent if an element is extracted in an across-the-board (ATB) fashion from all conjuncts, see (1b).

(1) a. *What$_1$ did [$_{\&P}$ [$_{TP}$ John like t$_1$] and [$_{TP}$ Mary hate the book]] ?
b. What$_{1,2}$ did [$_{\&P}$ [$_{TP}$ John like t$_1$] and [$_{TP}$ Mary hate t$_2$]] ?

The ATB-construction has a number of interesting properties (see de Vries 2017 for a recent overview). What we will focus on is the one-to-many relation between antecedents and gaps: In (1b) there is one antecedent (the wh-word) that is related to several gaps (one per conjunct). Under a 1:1 relation we would expect as many wh-antecedents as there are gaps, but this is excluded in ATB-constructions – even in languages that allow for multiple wh-fronting (Franks 1995).[1] Two types of analyses have been proposed to model the antecedent-gap mismatch: symmetric and asymmetric approaches. They differ in which conjuncts extraction takes place from: from all conjuncts (symmetric) or only from one of the conjuncts (asymmetric). There is no consensus yet which type of approach is to be preferred because the empirical evidence is controversial.

The goal of this paper is to provide a new diagnostic tool that allows us to distinguish between symmetric and asymmetric approaches to ATB-movement, namely asymmetric reflexes of movement. I will show that the existing ATB-approaches make different predictions about the distribution of these reflexes across the conjuncts under *long-distance*

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[1] A one-to-many antecedent-gap-relation is also found in Right Node Raising and parasitic gap constructions. Researchers have thus tried to unify these constructions, see among others Williams (1990); Munn (1993); Franks (1992); Ha (2008); Bachrach and Katzir (2009); Levine et al. (2001); Nunes (2004); and Postal (1993) for a critique.

ATB-movement. I present new data from four Niger-Congo languages that display asymmetric reflexes; the pattern that emerges under long ATB-movement matches the predictions of asymmetric approaches that postulate extraction from the first conjunct.

2 Approaches to ATB-movement

In this section I summarize existing approaches to ATB-movement, viz. symmetric and asymmetric approaches. The example used for illustration is *What does John like and Mary hate?* with wh-ATB-movement of an object. In symmetric approaches, wh-extraction affects all conjuncts, i.e., there is one extractee (and hence one gap) per conjunct. The approaches differ in how they explain the fact that we see only a single antecedent for the gaps. According to fusion approaches, the extractees fuse into one item in the terminal landing site (by a stipulated rule, Ross 1967; Williams 1978, or by feature intersection, Hein and Murphy 2017), see (2). The standard analysis of ATB-movement in HPSG (Pollard and Sag 1994; Levine et al. 2001) is also of fusion approach: The $\bar{\text{A}}$-dependency is implemented as slash feature percolation. From each conjunct, one slash feature percolates; the percolated features are merged into a single slash feature via set union at the &P-level. Hence, only one antecedent is required to saturate this remaining slash feature.

(2) $\textbf{What}_{\mathbf{1,2}}$ does [$_{\text{\&P}}$ [$_{\text{TP}}$ John like $\mathbf{t_1}$] and [$_{\text{TP}}$ Mary hate $\mathbf{t_2}$]] ?

According to the symmetric multi-dominance/sharing approaches (Williams 1978; Goodall 1987; Moltmann 1992; Citko 2005; Gračanin-Yüksek 2007; Bachrach and Katzir 2009), there is only a single wh-element in the structure, but it is linked to all conjuncts (in a multi-dominance fashion) and is thus extracted from all conjuncts simultaneously, see (4); it follows automatically that we see only one antecedent in the scope position.

(3) $\textbf{What}_{\mathbf{1}}$ does [$_{\text{\&P}}$ [$_{\text{TP}}$ John like] and [$_{\text{TP}}$ Mary hate]] ?
$\mathbf{t_1}$

Asymmetric approaches to ATB-movement assume that $\bar{\text{A}}$-movement takes place from only one of the conjuncts, usually from the first (Conj1). But why do we see gaps in all conjuncts then? The basic idea is that there is also movement of an element *inside* the other conjunct(s) (Conj2); but crucially, this movement step does not leave the other conjunct(s); it rather targets their CP- or vP-edge. Furthermore, the XP moved inside Conj2 is not pronounced; this may be because (a) it is a null operator OP (= the parasitic gap (pg) approach, Munn 1993; Franks 1995), or (b) because it is elided at PF under identity with the extractee in Conj1 (= ellipsis approach, Salzmann 2012a), see (4) (ellipsis is indicated by a strike-through). The result looks as if there are two gaps related to one antecedent, but in fact each gap has its own antecedent. While most asymmetric analyses postulate extraction from Conj1, Ha (2008) proposes the opposite, i.e., asymmetric extraction from Conj2 plus ellipsis of the wh-XP that moves inside Conj1, see (5).

(4) $\textbf{What}_{\mathbf{1}}$ does [$_{\text{\&P}}$ [$_{\text{TP}}$ John like $\mathbf{t_1}$] and [$_{\text{TP}}$ $\textbf{OP}_{\mathbf{2}}$/$\cancel{\textbf{what}_{\mathbf{2}}}$ Mary hate $\mathbf{t_2}$]] ?

(5) $\textbf{What}_{\mathbf{2}}$ does [$_{\text{\&P}}$ [$_{\text{TP}}$ $\cancel{\textbf{what}_{\mathbf{1}}}$ John like $\mathbf{t_1}$] and [$_{\text{TP}}$ Mary hate $\mathbf{t_2}$]] ?

Finally, the sideward movement approach to ATB-movement is symmetric and asymmetric in nature (Nunes 2001, 2004). Crucially, there is only a single wh-XP in the numeration. It is base-merged in Conj2 (as the object in our example). Conj1 is built up independently from Conj2; its object slot is filled by sideward moving the wh-XP from its base position in Conj2 to the corresponding position in Conj1. Next, the conjuncts are connected and the wh-XP moves from its current position in Conj1 to its terminal landing site, see (6).

(6) **What$_1$** does [$_{\&P}$ [$_{TP}$ John like $\mathbf{t_1'}$] and [$_{TP}$ Mary hate $\mathbf{t_1}$]] ?

The question is whether there is any empirical evidence for one of the two types of approaches. A recurring argument in the literature is reconstruction effects. It has been claimed for English and German that reconstruction for Principles A, C and weak crossover is only obligatory into Conj1 (Moltmann 1992; Munn 1993; Fox 2000; Nissenbaum 2000; Citko 2005; Salzmann 2012b), as would be expected under asymmetric extraction from Conj1. (7) exemplifies this for Principle A (Munn 1993: 52):

(7) a. [Which picture of himself$_i$] did [$_{\&P}$ [John$_i$ buy] and [Mary paint]] ?
b. *[Which picture of herself$_j$] did [$_{\&P}$ [John$_i$ buy] and [Mary$_j$ paint]] ?

However, the empirical picture is more complicated. First, the validity of the above judgments is disputed. Some authors claim that symmetric reconstruction into both conjuncts is possible after all (see Haïk 2009; Nissenbaum 2000; Ha 2008). In fact, this view is supported by recent experimental work on reconstruction for Principle C in ATB-constructions in English (Bruening and Al Khalaf 2017b). Second, reconstruction for variable binding, idiom interpretation, scope, and strong crossover is indisputably symmetric in the ATB-construction (Williams 1990; Citko 2005); see Munn (1994); Hornstein and Nunes (2002); Salzmann (2012a) for discussion and explanations of this potential split between reconstruction diagnostics. We thus need evidence from other areas to distinguish between the ATB-approaches. I will provide such evidence from inflection, viz., reflexes of movement.[2]

3 The argument in a nutshell

The empirical argument that I will provide rests on two ingredients: long-distance movement and locality. We need to consider long ATB-movement as in (8a) in order to detect the effect; here, the conjuncts are clauses (CPs), each introduced by a complementizer. It is by now a standard assumption that long movement applies in a successive-cyclic fashion, at least through the edge (SpecC) of every clause (see Chomsky 1973 et seq. and Abels 2012; van Urk 2015 for recent overviews of the empirical evidence). As a consequence, long ATB-movement as in (8a) proceeds as in (8b), with landing sites of the wh-XP at the edge of each CP-conjunct, indicated by a box.

[2]For a general discussion about whether there is reconstruction of nouns for Principle C at all, see the experimental results in Adger et al. (to appear); Bruening and Al Khalaf (2017a); Georgi et al. (2018). Other phenomena that have been used to argue for/against a particular ATB-approach are subject-verb-agreement under ATB-movement of the finite verb in English and German (An 2006; Salzmann 2012a) and case matching effects (Dyła 1984; Bondaruk 2003; Citko 2005; teVelde 2005; Hartmann et al. 2016). While the former provides evidence for asymmetric approaches, the latter supports symmetric analyses.

(8) a. **What** do you think [$_{\&P}$ [$_{CP}$ that John likes t] and [$_{CP}$ that Mary hates t]]] ?
b. **What** do you think [$_{\&P}$ [$_{CP}$ $\square$ that John likes t] and [$_{CP}$ $\square$ that Mary hates t]]] ?

Crucially, the approaches to ATB-constructions differ in which kind of movement to the boxed positions they would postulate: an intermediate movement step (if the wh-XP moves on into the matrix clause) or a terminal movement step (if the wh-XP stops at the edge of the conjunct). The postulated type of movement step is listed in (9) for each clause (MC = matrix clause, Conj1/2 = 1st/2nd conjunct) and each approach:

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

approach	MC	Conj1	Conj2
symmetric	terminal	intermediate	intermediate
asym. extraction from Conj1	terminal	intermediate	terminal
asym. extraction from Conj2	terminal	terminal	intermediate
sideward mvt.	terminal	intermediate	–

SpecC of the MC is the scope position of the visible wh-element and thus always its terminal landing site. In symmetric approaches with extraction from each conjunct, the boxed position at the edge of each CP-conjunct serves as an intermediate landing for the wh-elements on their way to MC-SpecC. In asymmetric approaches, only the boxed position of the conjunct that extraction takes place from is an intermediate landing site; in the other conjunct, SpecC constitutes the terminal landing site of the wh-element that moves inside this conjunct. Under sideward movement, the wh-element merged in Conj2 moves directly to Conj1 from its base-merge site in Conj2; it has no additional landing site at the edge of Conj2. But it moves through SpecC of Conj1 before it continues to move to the MC. When we consider (9), we see that each ATB-approach leads to a different combination of movement step types in the conjuncts. If we can make the difference between the two types of movement steps visible, we can check which approach makes the correct predictions.

In fact, there is a phenomenon which visibly distinguishes these types of movement steps: asymmetric reflexes of movement. Reflexes of movement are changes of the morpho-phonological shape of elements along the path of $\bar{A}$-movement (see a.o. Boeckx 2008; Abels 2012; Georgi 2014; van Urk 2015 for overviews). Crucially, languages differ in how these reflexes are distributed across the affected clauses under long $\bar{A}$-movement. This is schematically illustrated in (10), a case of long wh-movement of an XP across two CP boundaries (CP_2 and CP_3); the reflex R (bold-faced) triggered by this movement surfaces on, say, the complementizer C. Three types of languages can be distinguished (Georgi 2014, 2017): (i) The reflex occurs in every clause along the path of movement, viz. on C_1 – C_3 in (10a) (a pattern famously attested in Modern Irish *aL*-chains, McCloskey 2001); (ii) the reflex surfaces only in the clause where the wh-XP has its terminal landing site (viz. on C_1), but not in clauses it passes through, see the pattern in (10b); and (iii) the reflex is visible solely in clauses through which movement passes (viz. on C_2 and C_3) but not in the clause where it terminates, see the pattern in (10c).[3]

[3] It is an interesting question how the variation in (10) arises and can be derived, see Georgi (2014, 2017) for discussion and a proposal. But the answer is actually irrelevant for the argumentation in this paper. For the sake of concreteness, I assume that long movement applies successive-cyclically in all languages, but in those with patterns (10b) and (10c) only some movement steps are overtly tracked by a reflex.

(10) a. the reflex occurs in every CP crossed by the Ā-dependency:
$[_{\mathrm{CP}_1}\ \mathrm{XP}_{\mathrm{wh}}\ [_{\mathrm{C}'_1}\ \mathbf{C_1\text{-}R}\ \ldots\ [_{\mathrm{CP}_2}\ \ldots\ \mathbf{C_2\text{-}R}\ \ldots\ [_{\mathrm{CP}_3}\ \ldots\ \mathbf{C_3\text{-}R}\ \ldots\ \_\_{}_{\mathrm{XP}}\ ]]]]$

b. the reflex occurs only in the terminal clause of the Ā-dependency
$[_{\mathrm{CP}_1}\ \mathrm{XP}_{\mathrm{wh}}\ [_{\mathrm{C}'_1}\ \mathbf{C_1\text{-}R}\ \ldots\ [_{\mathrm{CP}_2}\ \ldots\ \mathrm{C}_2\ \ \ldots\ \ [_{\mathrm{CP}_3}\ \ldots\ \mathrm{C}_3\ \ldots\ \ \_\_{}_{\mathrm{XP}}\ ]]]]$

c. the reflex occurs only in intermediate clauses of the Ā-dependency
$[_{\mathrm{CP}_1}\ \mathrm{XP}_{\mathrm{wh}}\ [_{\mathrm{C}'_1}\ \mathrm{C}\ \ \ldots\ \ [_{\mathrm{CP}_2}\ \ldots\ \mathbf{C_2\text{-}R}\ \ldots\ [_{\mathrm{CP}_3}\ \ldots\ \mathbf{C_3\text{-}R}\ \ldots\ \_\_{}_{\mathrm{XP}}\ ]]]]$

For our purposes, type (10b)- and (10c)-languages with an asymmetric distribution of movement reflexes are relevant, since they exhibit a morphologically visible distinction between terminal and intermediate movement steps: The reflex in (10b)-languages tracks terminal movement steps and the reflex in (10c)-languages tracks intermediate ones. Thus, if we inspect the distribution of reflexes under long ATB-movement in languages with these two reflex patterns, we can see which type of movement occurs inside the conjuncts. The predicted reflex types can be read off the table in (9): 'Intermediate' means that we should see the reflex form that occurs solely in clauses crossed by Ā-movement, and 'terminal' means that we should see the form of the reflex that surfaces only in the clause with the terminal landing site of Ā-movement. Under symmetric extraction we should see the intermediate reflex form in both conjuncts, and hence a different one than in the MC, where the terminal step applies. In asymmetric approaches, the conjuncts are expected to host different reflex forms; the conjunct that contains the terminal movement step should exhibit the same reflex form as the MC. Sideward movement predicts a three way contrast: the terminal reflex form in the MC, an intermediate one in Conj1 from which extraction to the MC takes place, and no reflex inside Conj2.

4 ATB-data and results

I will now present the ATB-data from four Niger-Congo languages that exhibit asymmetric reflexes of movement to study the distribution of the reflexes across conjuncts. The data were provided by at least two native speakers for each language.[4] (11) gives an overview of the languages and reflexes as well the reflex pattern under long (non-ATB) Ā-movement:[5]

(11) Languages with asymmetric reflexes tested for long ATB-movement:

language	spoken in	reflex affects	reflex tracks	pattern
Duala	Cameroon	post-verbal particle *nɔ́-*	terminal step	
Bùlì	Ghana	form of the complementizer	terminal step	(10b)
Ewe	Ghana	form of the 3sg subject pronoun	terminal step	
Kiitharaka	Kenia	pre-verbal marker *n-*	intermed. step	(10c)

[4]Informants: Louise Soppi Ebonji, Anne R. Same, Gaelle L. Eke Belle (Duala); Abdul-Razak Sulemana (MIT), George Akanlig-Pare (University of Ghana) (Bùlì); Kofi Dorvlo (University of Ghana), Ken Adevu (OLA Senior High School, Ho), Edem Dande (Senior High, Agbozume) (Ewe); Lydia Ruguru (Kenyatta University), Purity Isumbi, Rufo Kiria, Doreen Muthoni, Eric Mutumiria (University of Embu) (Kiitharaka).

[5]In all the languages discussed here the Ā-dependency exhibits the hallmarks of movement (island-sensitivity, reconstruction effects). For reasons of space, I have to refer the reader to the literature cited below for relevant examples. Furthermore, note that the reflexes in Duala, Ewe and Kiitharaka are triggered by Ā-movement to SpecC even though they occur in the v-/T-domain (attached to the verb in v/T or to the XP in SpecT). But crucially, A-movement to SpecT does not cause these reflexes. I thus assume that the reflexes in these languages emerge in the C-domain but are lowered at PF to the T-domain.

In Duala (Epée 1975, 1976a,b; Kengne Cenny 2015) the particle *nɔ́* (sometimes written as *no*) must occur after the first verbal element of a clause in which a non-subject has undergone Ā-movement. Crucially, under long Ā-movement this reflex can only surface in the clause in which the Ā-moved XP has its terminal landing site, see (12). Thus, the particle tracks terminal movement steps, while intermediate ones are not marked at all.

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

a. Kuo a bodi **(*no)** nu moto kalati kiele
Kuo 3SG give NO that man book yesterday
"Kuo gave a book to that man yesterday." *declarative*

b. Kalati nde Kuo a bodi ***(no)** nu moto kiele
book FOC Kuo 3SG give NO that man yesterday
"It's a book Kuo gave to that man yesterday." *short focus mvt.*

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

Consider now ATB-movement in Duala. (13) shows short ATB-movement (taken from Kengne Cenny 2015: 100, ex. (69d)); here, the reflex obligatorily occurs in both conjuncts. I will return to short ATB-movement and the symmetric reflex distribution it exhibits below; but let us first concentrate on long ATB-movement, illustrated in (14).

(13) Njíkà múnà sáŋgó á tɔ́ndì-***(nɔ́)** ndé nyàŋgó á síŋgɛ́ɛ̄-***(nɔ́)**?
which child father SM like-NO and mother SM hate-NO
"Which child does father like and mother hate?" *short ATB-mvt.*

(14) Njíkà múnà ó m-ɔ́ŋgɛ̀lɛ́-**nɔ́** ná sáŋgò á tɔ̀ndi ndé nà nyàŋgó á
which child 2SG PRES-think-NO that father SM like and that mother SM
síŋgɛ́ɛ̄-**nɔ́**
hate-NO
"Which child do you think that father likes and that mother hates?" *long ATB-mvt.*

In (14) the reflex, which tracks terminal movement steps, occurs in the MC and in Conj2, but not in Conj1; a different distribution of the particle across CPs is ungrammatical. This pattern is predicted by approaches that postulate asymmetric extraction from Conj1 (cf. (9)): there is movement through the edge of Conj1 and a terminal movement step in Conj2.

In Bùlì (Hiraiwa 2005a,b; Sulemana 2014) Ā-movement affects the form of the complementizer C. Its default form, found in embedded declaratives, is *àyīn*; but if Ā-movement of non-subjects applies in a clause, C changes to *àtì*. This reflex tracks terminal movement steps since it only occurs in the clause that hosts the terminal landing site of a long Ā-dependency, while lower clauses contain the default C-form, see (15):

(15) C-form in Bùlì (Hiraiwa 2005a: 293, Sulemana 2014: 2,21):

a. Àtìm wɛ̄:nī **àyín / *àtì** Àmòak dà mángò-kú
Atim say.PST C Amoak buy.PST mango-DEF
"Atim said that Amoak bought the mango." *declarative*

b. ká b^{w}a **ātí** / ***àyín** bíːká dìgìː
Q what C child.DEF cook.PST
'What did the child cook?" *short wh-mvt.*

c. ká b^{w}a **àtì** / ***àyín** fí wéːní **āyīn** / ***àtì** bíːká dìgìː
Q what C 2SG say.PST C child.DEF cook.PST
"What did you say the child cooked ?" *long wh-mvt.*

Consider ATB-movement in Bùlì. Under clause-bound ATB-movement as in (16) the reflex of movement must occur in both conjuncts, otherwise ungrammaticality results.

(16) ká bwà **àtì** / ***àyín** Àmòak dà **àtì** / ***àyín** Àtìm dɛ
Q what C Amoak bought C Atim ate
"What did Amoak buy and Atim eat?" *short ATB-mvt.*

However, under long ATB-movement, the C-form that tracks terminal movement steps must occur in the MC and in Conj2, but not in Conj1; a different distribution is ungrammatical. As in Duala, this distribution is predicted by asymmetric extraction from Conj1.

(17) ká bwà **àtì** núrú-wú weːnɩ **àyīn** Àmòak dà **àtì** Àtìm dɛ
Q what C man-DEF said C Amoak bought C Atim ate
"What did the man say that Amoak bought and that Atim ate?" *long ATB-mvt.*

In Ewe (Collins 1993) the 3sg subject pronoun in declarative sentences is *é*, but it changes to *wò* under Ā-movement. Under long Ā-movement, this change to *wò* is obligatory in the clause in which the Ā-moved XP has its terminal landing site, but only optional in clauses crossed by movement. Thus, obligatory *wò* tracks terminal movement steps, see (18):

(18) *3sg pro in Ewe (Collins 1993: 157, 177f., Georgi 2017: 604f.)*:

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

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

c. [$_{CP}$ Meka-e **wò**/*é gblɔ [$_{CP}$ be **wò/é**-bu [$_{CP}$ be **wò/é**-fò]]]
who-FOC he say that he-think that he-hit
"Who did he$_i$ say that he$_j$ thinks that he$_m$ hit?" *long wh-mvt.*

In ATB-sentences the informants strongly prefer *wò* in both conjuncts, see (19) (the 3sg pronoun in each of the conjuncts is non-coreferent with the name in the other conjunct):

(19) a. Nu-ká **wò/??é** tu eye Kofi fle
thing-Q he build and Kofi buy
"What did he build and John buy?" *short ATB-mvt., Conj1*

b. Nu-ká Yao tu eye **wò/??é** fle
thing-Q Yao build and he buy
"What did Kofi build and he buy?" *short ATB-mvt., Conj2*

Under long ATB-movement, however, *wò* is obligatory in the MC and in Conj2, but optional in Conj1; this suggests that the wh-element makes a terminal movement step only in the MC and in Conj2. Again, this is predicted by asymmetric extraction from Conj1.

(20) a. Nu-ká **wò/*é**-bu be Yao tu eye Kofi fle
thing-Q he-think that Yao build and Kofi buy
"What does he think that Yao built and (that) Kofi bought?" *long ATB, MC*

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

c. Nu-ká Kosi bu be Yao tu eye **wò/*é**-fle
thing-Q Kosi think that Yao build and he-bought
"What does Kosi think that Yao built and that he bought?"
long ATB, Conj2

Finally, we turn to Kiitharaka. It differs from the other languages in that the reflex overtly tracks intermediate movement steps instead of terminal ones. In Kiitharaka (Harford 1997; Muriungi 2005; Abels and Muriungi 2008) the pre-verbal marker *n-* must surface in clauses affected by Ā-movement, but not in the clause in which Ā-movement terminates. We thus find it in embedded clauses of long Ā-movement but not in matrix questions, see (21):

(21) *Wh-movement (Muriungi 2005:45ff., 67-68)*:

a. I-mbi Maria (*n-)a-k-ir-e
FOC-what Maria N-SM-build-PERF-FV
"What did Maria build?" *short wh-mvt.*

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

The reflex, which tracks intermediate movement steps, must be absent (∅) from all conjuncts under short ATB-movement, see (22). Under long ATB-movement, it can surface only in Conj1, see (23). The abstract pattern is the same as in the three other languages: We have evidence for a terminal movement step in Conj2 and an intermediate step to the edge of Conj1, in line with approaches that postulate asymmetric extraction from Conj1.

(22) i-mbi Maria **∅**-a-gur-a noe John **∅**-a-rebur-a
FOC-what Maria ∅-SM-buy-FV and John ∅-SM-break-FV
"What did Maria buy and John break?" *short ATB-mvt.*

(23) i-mbi mfana **∅**-a-thugani-a ati Maria **n**-a-gur-ir-e noe John
FOC-what Mfana ∅-SM-think-FV that Maria N-SM-buy-PERF-FV and John
∅-a-rebur-a
∅-SM-broke-FV
"What does Mfana think that Maria bought and that John broke?"
long ATB-mvt.

To summarize, in all four languages short ATB-movement exhibits a symmetric pattern with the terminal form of the reflex in both conjuncts, while long ATB-movement exhibits an asymmetric pattern – this holds no matter which type of movement step (the terminal or the intermediate one) is overtly tracked by the reflex. This pattern is predicted solely by approaches that postulate asymmetric extraction from Conj1.

5 Deriving the asymmetry between short and long ATB-movement

Before concluding, I want to address the asymmetry between short and long ATB-movement found in all four languages. How can we explain that the reflexes are distributed symmetrically across the conjuncts under clause-bound ATB-movement but asymmetrically in sentences with long ATB-movement? I propose that this split arises due to a general locality restriction, viz. (relativized) minimality. For concreteness, I suggest that the head on which the reflex arises agrees upwards with the (copy of the) closest Ā-moved operator OP. The probing head is the C-head in the languages under consideration, since their reflexes are triggered only by Ā-movement to the C-domain (even if the reflex surfaces in the v-/T-domain in some of the languages). So when C targets OP, it copies (among other features) the information whether OP is in its terminal or in an intermediate landing site.[6] This information on the probing head C can then influence the phonological shape of the movement reflex (e.g. zero vs. overt) via contextual allomorphy. Let us consider short ATB-movement first. It probably involves TP-coordination; thus, there is only one C-head in the structure (above the &P) that can probe, see (24). This C-head targets the OP in its terminal landing SpecC (extracted from Conj1). This results in the presence of the terminal reflex form on C; there is no Agree with the OP moved inside Conj2, since Conj2 does not contain a C-head. That the reflex surfaces in both TP-conjuncts in Ewe, Kiitharaka and Duala is due to the fact that apparently, the reflex marker (or the corresponding feature) lowers to the T- or v-domain in these languages in the postsyntactic component. And we know that lowering into &P applies in an ATB-fashion, i.e. targets each conjunct (de Vos 2005; Embick 2007; Ostrove 2015), resulting in a symmetric distribution of the reflex.[7]

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

Under long ATB-movement with CP-coordination, MC, Conj1 and Conj2 each contain an upward-probing C-head, see (25). C^0 in the MC targets the OP in its specifier (extracted from Conj1), OP's terminal landing site. The C-head in Conj1 targets the the copy of OP extracted from Conj1 in SpecC of Conj1, an intermediate landing site. And C^0 in Conj2 targets the OP in its SpecC, which underwent a terminal movement step inside Conj2. Since each C-head targets a different (copy of) OP, the result is an asymmetric pattern. With the minimality restriction on upward probing we can thus derive the asymmetry in the distribution of movement reflexes between short and long ATB-movement.

[6] There are various proposals in the literature that make a featural distinction between XPs in terminal vs. intermediate landing sites or between the features on the heads that trigger these operations, see among others Nunes (2004); Chomsky (2000); Sabel (2000); Heck and Müller (2003); Bošković (2007); Georgi (2017). It is thus not implausible that Agree can target this information.

[7] in Bùlì, both conjuncts in a short ATB-configuration contain a C-head, so we are probably dealing with C′-coordination. Thus, there is one C-head per conjunct and each probes upwards for the closest OP. The C-head in Conj1 finds the OP in SpecC above the &P, extracted from Conj1. The C-head in Conj2 finds the OP moved to the edge of Conj2, but does not cross the &P. In any case, the targeted OPs are both in their terminal position and we thus see the terminal reflex form in all conjuncts.

terminal intermed.

(25) $[_{CP}$ **wh-XP**$_1$ $[_{C'}$ C $[_{TP}$ T ... $[_{VP}$ V $[_{\&P}$ $[_{CP_1}$ t'_1 $[_{C'_1}$ C_1 $[_{TP_1}$ T_1 ... t_1]]] $[_{\&'}$ $[_{CP_2}$ **OP**$_2$ $[_{C'_2}$ C_2 $[_{TP_2}$ T_2 ... t_2]]]]]]]]

terminal

6 Conclusion and open questions

I have presented a new diagnostic tool that allows us to distinguish between symmetric, asymmetric and sideward movement approaches to ATB-movement: asymmetric reflexes of Ā-movement. The approaches make different predictions about the distribution of such reflexes across the conjuncts under long distance ATB-movement with CP-coordination. The findings from four Niger-Congo languages provide evidence for asymmetric extraction from Conj1. The observed asymmetry between short and long ATB-movement within a language can be modeled by a locality restriction on upward Agree. However, the results do not allow us to distinguish between different versions of the asymmetric approach (ellipsis vs. empty OP movement); this requires more research on constructions with empty OP-movement in the respective languages. Let me stress that what I propose is first and foremost an empirical test; the results may vary from language to language.

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