

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

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**Claim:** I present new empirical evidence for asymmetric approaches to *across-the-board* (ATB) movement, and among these, for the empty OP-movement (pg) approach. The evidence comes from reflexes of movement, a diagnostic tool not used so far in the ATB-literature. I investigate languages in which the reflex shows a morphological distinction between terminal and intermediate movement steps. Existing approaches to ATB make different predictions about the distribution of these reflexes inside the conjuncts under *long-distance* ATB-movement. The data collected from native speakers of 4 Niger-Congo languages and from German provide evidence for asymmetric movement solely from the 1<sup>st</sup> conjunct + empty OP-movement inside the 2<sup>st</sup> conjunct, and against symmetric extraction and sideward movement.

**Background: I. ATB-movement:** Extraction from a coordination (&P) island is allowed if it takes place simultaneously from all conjuncts (= ATB-movement, Ross 1967), cf. (1):

(1) What did [<sub>&P</sub> [<sub>TP</sub> John like t ] and [<sub>TP</sub> Mary hate t ] ] ?

Interestingly, there is a mismatch between gaps and antecedents in ATB-constructions: a single antecedent seems to be related to several gaps (one per conjunct). Two types of approaches to this puzzle can be distinguished: (a) the symmetric approach and (b) the asymmetric approach. According to (a) extraction takes place from each conjunct (Conj) into the matrix clause (among others Williams 1978, Moltmann 1992, Citko 2005, Hein & Murphy 2016), cf. (2); there are different explanations for why only a single antecedent surfaces (stipulated rule / fusion of moved XPs, multi-dominance approach).

(2) What<sub>1,2</sub> did [<sub>&P</sub> [<sub>TP</sub> John like t<sub>1</sub> ] and [<sub>TP</sub> Mary hate t<sub>2</sub> ] ] ?

Under (b), extraction takes place only from the 1st conjunct (Conj1); inside Conj2, an element undergoes  $\bar{A}$ -movement, too (to SpecvP or the left edge), but it does not leave the &P; it is zero due to ellipsis or its empty OP status (e.g. Munn 1993, Franks 1995, Salzmann 2012), cf. (3):

(3) What<sub>1</sub> did [<sub>&P</sub> [<sub>TP</sub> John like t<sub>1</sub> ] and [<sub>TP</sub> Mary *what<sub>2</sub>*/OP hate t<sub>2</sub> ] ] ?

Ha (2008) proposes the opposite: asymmetric extraction from Conj2 + ellipsis in Conj1. Nunes' (2004) sideward movement analysis mixes properties of (a) and (b): the wh-XP moves from Conj2 into Conj1 and then to SpecC, but crucially for us, there is movement from both Conjs. There is no consensus yet which approach is to be preferred since the empirical arguments are controversial. The main argument for (b) is asymmetric reconstruction for Principles A, C solely to Conj1 (Citko 2005, Salzmann 2012b, Nissenbaum 2000, Munn 1993) but the facts are disputed (e.g. Haik 2009, Ha 2008, Bruening & Al Khalaf 2017). Evidence from inflection is mixed: subject-V-agreement under ATB-V-movement (An 2006, Salzmann 2012) provides evidence for the (b)-approach, while case matching (Borsley 1983, Franks 1995, Citko 2005, teVelde 2005) favours (a). Hence, we need more empirical evidence.

**II. Movement reflexes (MR):** MRs are morphological changes along the path of  $\bar{A}$ -movement; MRs in clauses crossed by movement that don't host the terminal landing site of the operator (OP) have been taken as evidence for successive-cyclic movement (Chomsky 1973 et seq., Abels 2012, Boeckx 2008), as e.g. *aL*-marking in Irish (McCloskey 2001). Author (2017) shows that two more MR patterns exist: (i) the MR only occurs in intermediate clauses (i.e. the ones *crossed* by movement, but not containing OP's final landing site) = *intermediate reflex*; (ii) the MR occurs only in the clause with OP's final landing site, but not in clauses crossed by OP-movement, = *terminal reflex*. I exemplify this for two languages with pattern (ii): In Duala (Bantu, Épée 1976, Biloa 1993) the particle *no* only surfaces in the terminal clause of long  $\bar{A}$ -movement, cf. (4). In Ewe (Kwa, Collins 1993) the 3sg subject pronoun *é* obligatorily changes to *wò* in the terminal clause, but only optionally in intermediate clauses of long  $\bar{A}$ -movement, cf. (5):

(4) [<sub>CP</sub> ni kalati<sub>k</sub> nde na ta \*(no) na kwalane Kuo [<sub>CP</sub> na a-angamente \*(no) wana t<sub>k</sub> ] ]  
that book FOC I PST NO I tell Kuo that 3SG-must bring  
“That's the book I told Kuo that he should bring.” *Duala, long foc-mvt.*

(5) [<sub>CP</sub> Meka-e<sub>k</sub> \*é/wò gblɔ [<sub>CP</sub> be é/wò-bu [<sub>CP</sub> be é/wò-fò t<sub>k</sub> ] ] ]  
who-FOC he say that he-think that he-hit  
“Who did he<sub>i</sub> say that he<sub>j</sub> thinks that he<sub>m</sub> hit?” *long wh-mvt. in Ewe, Author 2017*

I will further discuss Kitharaka (pattern (i): pre-verbal foc-marking occurs only in clauses crossed by movement, Abels & Muriungi 2008) and Bùlì (pattern (ii): the basic form of C *àyīn* becomes *àtì* under (non-subject)  $\bar{A}$ -movement but only in the terminal clause; Hiraiwa 2005, Sulemana 2014). Note: In these languages the dependencies with MRs clearly involve *movement* to *SpecCP*, not base-generation; no MR is triggered by A-movement to *SpecTP* or lower, even if the MR surfaces in the T-domain.

**Long ATB + reflexes – predictions:** We can choose between type (a) and (b) approaches to ATB once we consider long-distance ATB-movement (*What do you think that Mary likes and that John dislikes?*) where CPs are coordinated. Assuming that movement applies successive-cyclically (at least) through every *SpecC*, (a) vs. (b) approaches make different predictions about the distribution of the MRs in languages with terminal vs. intermediate MRs. According to (a), the ATB-moved OP leaves both *Conj1&2*; hence it makes an intermediate movement to *SpecC* of each conjunct, cf. (6). We should thus find the terminal MR-form in the matrix clause (MC), but the intermediate MR-form in both conjuncts (also predicted by Nunes’ sideward movement approach).

(6) [<sub>CP</sub> **What**<sub>1,2</sub> do you think [<sub>&P</sub> [<sub>CP</sub> **t**<sub>1</sub> that Mary likes t<sub>1</sub> ] and [<sub>CP</sub> **t**<sub>2</sub> that John dislikes t<sub>2</sub> ]]] ?

According to the (b)-approach with asymmetric extraction from *Conj1*, the ATB-moved element makes an intermediate movement step only in *SpecCP* of *Conj1*, but the empty OP in *Conj2* makes a terminal movement step to *SpecCP* of *Conj2*, cf. (7). Hence, we expect the terminal MR-form in both the MC and *Conj2*, but the intermediate MR-form in *Conj1*. Under Ha’s 2008 approach with asymmetric extraction from *Conj2*, we expect the opposite: terminal MR-form in the MC + *Conj1* and intermed. MR in *Conj2*.

(7) [<sub>CP</sub> **What**<sub>1</sub> do you think [<sub>&P</sub> [<sub>CP</sub> **t**<sub>1</sub> that Mary likes t<sub>1</sub> ] and [<sub>CP</sub> **OP**<sub>2</sub> that John dislikes t<sub>2</sub> ]]] ?

**Data:** Native speaker judgments about the distribution of MRs in the 4 Niger-Congo languages confirm the prediction of the (b)-approach with asymmetric extraction from *Conj1* (contra Ha 2008, symmetric approaches and sideward movement): We find the terminal-MR in the MC and in *Conj2*, but the intermediate MR in *Conj1*, cf. the data from Duala, Bùlì and Ewe below (Kitharaka behaves the same).

(8)a. Duala: particle *no* (=terminal MR) necessary in MC and *Conj2*, prohibited in *Conj1*:

Nj́ka ɛ̀ŋɛ̀ŋgɛ̀n o mújgɛ̀lɛ̀-\*(nò) ná Dika à tɔ̀ndí-\*(nò) ndé nà E. à sìjgɛ̀ɛ̀-\*(nò)  
 which fruit you think-NO that Dika SM love-\*(NO) and that E. SM hate-NO  
 “Which fruit do you think that Dika likes and that Elame hates?”

b. Bùlì: default form of C (*àyīn*) in *Conj1*, terminal MR-form (*àtì*) in MC and *Conj2*:

ká bwà àtì/\*àyīn núrú-wú wē:nī \*àtì/àyīn Àmòak dà àtì/\*àyīn Àtìm dè?  
 FOC what that man-DEF said that Amoak bought that Atim ate  
 “What did the man say that Amoak bought and that Atim ate?”

c. Ewe: obligatory 3sg pro *wò* (= term. MR) in MC (not shown) and *Conj2*; optional in *Conj1*:

Nu-ká K. bu be é/wò-tú eye ne-fle? | Nu-ká K. bu be Y. tú eye \*é/wò-fle?  
 thing-Q K. think that 3SG-build and 2SG-buy | thing-Q K. think that Y. build and 3SG-buy  
 “What does Kosi think that he built & you bought?” | “What does Kosi think that Yao built & he bought?”

**Distinguishing between asymmetric approaches:** So far, the data are compatible with asymmetric approaches using empty OP-movement and ellipsis. We now present evidence from German *denn*-licensing that favor the empty OP approach. Bayer et al. (2016) show that the discourse particle *denn* in German is licensed in terminal and intermediate clauses of wh-movement. Hence, one may expect it to surface in both *Conjs* under long-ATB in symmetric as well as asymmetric approaches (and it would thus be uninformative for present purposes). However, data collected from 30 native speakers show that this is not the case: *denn* is licensed in the MC + *Conj1*, but *not* in *Conj2*. How can we explain this? Crucially, the same speakers cannot license *denn* in adjunct clauses containing a parasitic gap (*pg*) which results from empty OP-movement. Thus, *denn* is not licensed by any kind of  $\bar{A}$ -movement, e.g. not by empty OP-movement. In view of this, the distribution of *denn* under long ATB follows from the empty OP-approach: *denn* in MC+*Conj1* is licensed by terminal/intermediate movement of the wh-XP from *Conj1* to the MC; but empty OP-movement inside *Conj2* does not license *denn*. Under an ellipsis/ sideward mvt./symmetric approach this is unexpected (without further assumptions) since a wh-XP moves inside/from *Conj2*.

**Conclusion:** The distribution of terminal vs. intermediate MRs under long movement provides new evidence for asymmetric extraction from *Conj1* + empty OP-movement inside *Conj2* in ATB-constructions.