

## Asymmetric verb doubling in Asante Twi and the order of operations at PF

Johannes Hein, University of Leipzig

**Claim:** I argue that the asymmetric (Asante) Twi pattern of verb doubling in predicate clefts (i.e. verbal focus) (see e.g. Koopman, 1984; Aboh, 2006; Harbour, 2008; Trinh, 2011, on predicate clefts in various languages) is due to the order of the two operations Chain Reduction (CR) and head-to-head movement (HHM) at PF. CR bleeds HHM in Twi while it counterbleeds it in languages with symmetric verb doubling like Hebrew (Landau, 2006).

**Puzzle:** Twi may focus an uninflected verb (V fronting) or verb phrase (VP fronting). With V fronting, a second, fully inflected token of the verb is pronounced in its base position (1a). With VP fronting, an inflected dummy verb *yo* (≈ 'do') occurs instead (1b). This pattern is unexpected both (i) conceptually and (ii) typologically: (i) If the verb is doubled in (1a) to host the tense/aspect affixes in T/*v* (Landau, 2006, cf. Hebrew), why is it not doubled in (1b)? Likewise, if *do* hosts the affixes in (1b), why is it not used in (1a)? (ii) Most languages that show verb doubling in similar context exhibit it in both environments symmetrically (e.g. Hebrew topicalisation, (2)).

**Syntactic properties:** The predicate cleft involves movement (Landau, 2006; Vicente, 2009) rather than base generation (Cable, 2004) of the fronted constituent as it can cross finite clause boundaries (3), is sensitive to islands (4), and shows tonal reflexes of A'-movement (5) (Korsah & Murphy, 2015). Kandybowicz (2015) shows that the aspect head is between *v* and V in AT. Since the fronted constituent cannot bear any aspect marking it must be V(P) rather than *v*(P). Also, the verb in V fronting must be a bare head (A'-head-movement, Koopman, 1984; Vicente, 2009) rather than a remnant VP as AT provides no independent evidence for VP evacuating object movement.

**Proposal:** Under the Copy theory of movement (Chomsky, 1995), the verb actually moves twice in the above constructions. The first movement is (successive-cyclic) syntactic movement via *spec*vP to *spec*CP (either as a bare verb or as part of the VP), the second is head(-to-head) movement (HHM) of the lowest V copy to *v* and/or T (cf. Aboh, 2006; Chomsky, 2008; Aboh & Dyakonova, 2009, on parallel chains). HHM has been independently suggested to be a PF operation (Chomsky, 1995; Brody, 2000; Harley, 2004; Platzack, 2013) that might not leave any copies (Boeckx & Stjepanović, 2001; Sauerland & Elbourne, 2002) whereas there is evidence that movement of a bare head into a specifier position (HSM) is syntactic A'-movement, because it behaves on a par with phrasal A'-movement (Koopman, 1984; Landau, 2006; Vicente, 2009). Thus, the two movements crucially happen on two different levels: HSM in (narrow) syntax and HHM at PF. A second independently proposed operation is Chain Reduction (CR) that applies to syntactic movement chains at PF and (usually) deletes all but the highest chain link (Bobaljik, 1995; Pesetsky, 1998; Nunes, 2004). I propose that every language has a strict order of the two PF operations CR and HHM, and that this order is responsible for whether there is verb doubling or *do*-support with VP fronting while there is verb doubling with V fronting under either order. If CR applies before HHM (inbetween the two movements) in VP fronting constructions, it deletes the lowest copy of the VP including its constituents V and the object DP. Subsequent HHM of V to *v*/T is blocked and *do* is inserted to enable spell-out of inflectional affixes in *v*/T as is the case in Twi (6). If, on the other hand, CR applies after HHM (after the two movements), the lowest V has been moved out of the VP to *v*/T before that VP is deleted. The lower V copy is therefore no longer part of the VP chain, evades deletion, and is pronounced as the second verb token in the structure, as is the case in Hebrew and other verb doubling languages (7). In constructions where instead of a VP a bare V head has been moved into a specifier position, however, there is no chain between the lower V copy and the higher one to which CR could apply. Since the lower copy in the base position is minimal but not maximal while the higher copy in a specifier position is minimal and maximal, a chain containing both of them would violate the Chain Uniformity Condition (Chomsky, 1995) which demands that chain links are of the same projection level. Therefore, CR cannot apply to the V copies and delete the lower one even if it is ordered before HHM as in (8). There is thus no bleeding of V-to-*v*/T movement and both verb copies are pronounced under either order of operations which is the reason for why verb doubling occurs with V fronting in both Twi and Hebrew. As I will show, the same dependency between order of operations and verb doubling vs. *do*-support holds for languages that front the *v*(P) (as has been argued to be the case in Hebrew by Landau, 2006) if the entire phase is sent off to PF, with only its edge and head accessible to further syntactic operations (as argued for by Fox & Pesetsky, 2005; Svenonius, 2005; Richards, 2011). This modification further allows for the derivation of languages that use remnant VP movement instead of HSM to front a bare verb, predicting that such a language behaves the same in V and VP fronting w.r.t. whether it shows verb doubling or *do*-support (verb doubling with HHM > CR; *do*-support with CR > HHM, (9)).

**Typological implications:** The account cannot derive *do*-support with V fronting and verb doubling with VP fronting, correctly predicting the non-existence of languages with this pattern. It predicts the existence of four language types, all of which are attested: (i) HSM of V/*v* in bare verb fronting and the order CR > HHM (Akan); (ii) the same with HHM > CR (Hebrew); (iii) remnant VP/*v*P movement and CR > HHM (always *do*-support, German, Müller, 2014); (iv) the same and HHM > CR (always verb doubling, Polish, Bondaruk, 2012). Furthermore, the proposal has interesting consequences for the structure of PF and for head movement phenomena in general.

- (1) a. Si-(e) na Kofi a-si/\*yɔ dan. b. Dan si-e na Kofi a-yɔ/\*si  
build-NMLZ FOC Kofi PFV-build/do house house build-NMLZ FOC Kofi PFV-do/build  
'Kofi has BUILT a house.' 'Kofi has BUILT A HOUSE.'
- (2) a. Liknot, hi kanta et ha-praxim. b. Liknot et ha-praxim, hi kanta.  
buy.INF she buy.PST ACC DEF-flowers buy.INF ACC DEF-flowers she buy.PST  
'As for buying, she bought the flowers' 'As for buying the flowers, she bought (them).'
- (3) a. Si-(e) na Ama ka-a sɛ Kofi a-si dan.  
build-NMLZ FOC Ama say-PST COMP Kofi PRF-build house  
'Ama said that Kofi has BUILT a house.'  
b. Dan si-e na Ama ka-a sɛ Kofi a-yɔ.  
house build-NMLZ FOC Ama say.PST COMP Kofi PRF-do  
'Ama said that Kofi has BUILT A HOUSE.'
- (4) *Complex NP island*  
a. \*Si-(e) na me-n-te-e atetesɛm biara sɛ Kofi a-si dan.  
build-NMLZ FOC 1SG-NEG-hear-PST rumour.PL any COMP Kofi PRF-build house  
'I didn't hear any rumours that Kofi has BUILT a house.'  
b. \*?Dan si-e na me-n-te-e atetesɛm biara sɛ Kofi a-yɔ  
house build-NMLZ FOC 1SG-NEG-hear-PST rumour.PL any COMP Kofi PRF-do  
'I didn't hear any rumours that Kofi has BUILT A HOUSE.'
- (5) a. Ama re-di bayéré. b. Déén na Ama ré-dí? c. Di na Ama ré-dí bayéré.  
Ama PROG-eat yam what FOC Ama PROG-eat eat FOC Ama PROG-eat yam  
'Ama is eating a yam.' 'What is Ama eating?' 'Ama is EATING a yam.'
- (6) a.  $[_{TP} T [_{vP} [_{VP} V O] [_{v'} v [_{vP} \bar{V} \ominus \textcircled{1}]]]]$  b.  $[_{CP} [_{VP} V O] [_{C'} C [_{TP} T-v(-do) [_{vP} [_{vP} \bar{V} \ominus \textcircled{1}] \dots]]]]$
- (7) a.  $[_{TP} T [_{vP} [_{VP} V O] [_{v'} v [_{vP} (V) \ominus \textcircled{2}]]]]$  b.  $[_{CP} [_{VP} V O] [_{C'} C [_{TP} T-v-V [_{vP} [_{vP} \bar{V} \ominus \textcircled{2}] \dots]]]]$
- (8) a.  $[_{TP} T [_{vP} V^{[min,max]} [_{v'} v [_{VP} V^{[min]} O]]]]$  b.  $[_{CP} V [_{C'} C [_{TP} T-v-V [_{vP} \bar{V} \textcircled{1}] \dots]]]$
- (9) *Repair strategy depending on order of operations and constituency of the moved element*

Surface	Constituent	Order of PF operations	
		HHM > CR	CR > HHM
VP fronting	complete VP/vP	verb doubling	do-support
V fronting	remnant VP/vP	verb doubling	do-support
	bare V/v+V	verb doubling	verb doubling

#### REFERENCES:

- Aboh, E. O. (2006): When verbal predicates go fronting. In: *ZAS PiL* 46. Aboh, E. O. & Dyakonova, M. (2009): Predicate doubling and parallel chains. *Lingua*, 119. Bobaljik, J. (1995): *Morphosyntax: The syntax of verbal inflection*. PhD thesis, MIT. Boeckx, C. & Stjepanović, S. (2001): Head-ing toward PF. *LI*, 32. Bondaruk, A. (2012): Copy deletion in Polish predicate clefting. In: *Sound, structure and sense*. Katolicki Uniwersytet Lublin. Brody, M. (2000): Mirror theory: Syntactic representation in perfect syntax. *LI*, 31. Cable, S. (2004): Predicate clefts and base-generation: Evidence from Yiddish and Brazilian Portuguese. Ms., MIT. Chomsky, N. (1995): *The Minimalist Program*. MIT Press. Chomsky, N. (2008): On phases. In: *Foundational Issues in Linguistic Theory*. MIT Press. Fox, D. & Pesetsky, D. (2005): Cyclic linearisation of syntactic structure. *Theoretical Linguistics*, 31. Harbour, D. (2008): Klivaj predika, or predicate clefts in Haitian. *Lingua*, 118. Harley, H. (2004): Merge, conflation, and head movement. The First Sister Principle revisited. In: *NELS* 34, GLSA. Kandybowicz, J. (2015): On prosodic vacuity and verbal resumption in Asante Twi. *LI*, 46. Koopman, H. (1984): *The syntax of verbs: From verb movement rules in the Kru languages to Universal Grammar*. Foris. Korsah, S. & Murphy, A. (2015): Tonal Reflexes of Movement in Asante Twi. Ms., Universität Leipzig. Landau, I. (2006): Chain Resolution in Hebrew V(P)-fronting. *Syntax*, 9. Müller, G. (2014): *Syntactic Buffers*. Universität Leipzig. Nunes, J. (2004): *Linearization of Chains and Sideward Movement*. MIT Press. Pesetsky, D. (1998): Some optimality principles of sentence pronunciation. In: *Is the best good enough?*, MIT Press. Platzack, C. (2013): Head movement as a phonological operation. In: *Diagnosing Syntax*, OUP. Richards, M. (2011): Deriving the edge: what's in a phase. *Syntax*, 14. Sauerland, U. & Elbourne, P. (2002): Total reconstruction, PF movement, and derivational order. *LI*, 33. Svenonius, P. (2005): Extending the extension condition to discontinuous idioms. *Linguistic Variation Yearbook*, 5. Trinh, T. (2011): *Edges and linearization*. PhD thesis, MIT. Vicente, L. (2009): An alternative to remnant movement for partial predicate fronting. *Syntax*, 12.