

# On Prosodic Vacuity and Verbal Resumption in Asante Twi\*

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## ABSTRACT

I argue that verbal resumption (the occurrence of an additional default verbal element *yε* meaning 'do') in Asante Twi is prosodically conditioned. Following the Match theory of syntactic-prosodic constituency correspondence (Selkirk 2011), I propose that phono-syntactic constituency matching requires, at the minimum, avoidance of phonetically empty transferred syntactic structures (i.e. prosodic vacuity). I show that Twi verbal resumption is highly constrained and occurs precisely in those contexts where a prosodically vacuous domain would otherwise be mapped from a fully evacuated syntactic spell-out domain. As a measure of last resort, a late default-form insertion of the verb root (the *yε* form) occurs to evade prosodic vacuity and ensure a matching correspondence between syntactic and prosodic constituents at PF. Because an additional higher copy of the verb root (i.e. the lexical verb) survives as well, Twi verbal resumption represents an instance of multiple copy spell-out. The article thus bears on several issues concerning the syntax-phonology interface, among them, the nature of prosodic mapping and the conditions regulating multiple copy realization.

## KEYWORDS

Prosodic Vacuity • Prosodic Mapping • Match Theory • Verbal Resumption •  
Multiple Copy Spell-out • Asante Twi

## 1. Overview: A Curious Distribution

In Asante Twi, there is a striking relationship between clause structure/derivation and verbal resumption (the occurrence of an additional default verbal element). In simple past tense clauses, intransitive verbs (both unergative and unaccusative) are obligatorily followed by non-thematic occurrences of *yε*, a multi-purpose predicate meaning ‘do’, ‘make’ and ‘be’, among others. The data in (1a-b) below illustrate Twi *yε*-insertion with both types of intransitive predicates, while the examples in (2) illustrate the semantic broadness of the *yε* form when used as a main verb.

- (1) a. Kofi saa \*(yε).  
       Kofi dance.PST *yε*  
       ‘Kofi danced.’
- b. Dua no shii \*(yε).  
       tree the burn.PST *yε*  
       ‘The tree burned.’
- (2) a. Kofi rε-yε.  
       Kofi PROG-do  
       ‘Kofi is doing it.’
- b. Kofi yεε \*(yε).  
       Kofi do.PST *yε*  
       ‘Kofi did it.’

- c.    ε       yε    me   dε    sε    Kofi bɔɔ    Ama.  
       3<sup>RD</sup>.SG make 1<sup>ST</sup>.SG sweet COMP Kofi kick.PST Ama  
       ‘It makes me happy that Kofi kicked Ama.’
- d.    Aduane no yε dε.  
       food     the be sweet  
       ‘The food is good.’

Post-verbal *yε* is limited to the simple past tense. In all other aspects and periphrastic tense constructions<sup>1</sup>, *yε* may not follow an intransitive verb.

- (3) a.    Kofi a-sa/shi       (\*yε).       (Perfect)  
       Kofi PRF-dance/burn *yε*  
       ‘Kofi has danced/burned.’
- b.    Na Kofi a-sa/shi       (\*yε).       (Past perfect)  
       PST Kofi PERF-dance/burn *yε*  
       ‘Kofi had danced/burned.’
- c.    Kofi re-sa/shi       (\*yε).       (Present progressive)  
       Kofi PROG-dance/burn *yε*  
       ‘Kofi is dancing/burning.’

- d. Na Kofi re-sa/shi (\*yε). (Past progressive)  
 PST Kofi PROG-dance/burn yε  
 ‘Kofi was dancing/burning.’
- e. Kofi taa<sup>2</sup>-sa/shi (\*yε). (Habitual)  
 Kofi HAB-dance/burn yε  
 ‘Kofi dances/burns (habitually).’
- f. Kofi bε sa/shi (\*yε). (Periphrastic future)  
 Kofi come dance/burn yε  
 ‘Kofi will dance/burn.’ (Lit: ‘Kofi came to dance/burn.’)
- g. Kofi rε-bε sa/shi (\*yε). (Periphrastic immediate future)  
 Kofi PROG-come dance/burn yε  
 ‘Kofi is about to dance/burn.’ (Lit: ‘Kofi is coming to dance/burn.’)

The polarity of the clause has a decisive role to play as well. Under the scope of negation in the past, *yε*-insertion is blocked. In the affirmative, however, it is obligatory. Consider the following contrast.

- (4) a. Kofi an-sa/shi (\*yε).  
 Kofi NEG.PAST-dance/burn yε  
 ‘Kofi did not dance/burn.’

- b. Kofi saa/shii \*(yε).  
 Kofi dance.PST/burn.PST yε  
 'Kofi danced/burned.'

The presence or absence of a surface complement also matters. As illustrated in (5) below, Twi yε-insertion is systematically unavailable in transitive constructions with unmoved complements, regardless of tense or aspect.

- (5) a. Kofi bɔɔ (\*yε) Ama (\*yε).  
 Kofi kick.PST yε Ama yε  
 'Kofi kicked Ama.'
- b. Kofi rε-bɔ (\*yε) Ama (\*yε).  
 Kofi PROG-kick yε Ama yε  
 'Kofi is kicking Ama.'
- c. Yaw kaa (\*yε) sɛ³ Kofi bɔɔ (\*yε) Ama (\*yε).  
 Yaw say.PST yε COMP Kofi kick.PST yε Ama yε  
 'Yaw said that Kofi kicked Ama.'

d. Yaw a-ka (\*yε) sε Kofi taa-bo (\*yε) Ama (\*yε).

Yaw PRF-say yε COMP Kofi HAB-kick yε Ama yε

‘Yaw has said that Kofi kicks Ama (habitually).’

The curiosity deepens when we consider the effect of post-verbal adverbs on *yε*-insertion. As shown below, certain adverbs appearing in this position obviate the insertion of *yε* (6a), while others do not (6b).

(6) a. Kofi saa (\*yε) ntεm (\*yε).

Kofi dance.PST yε quickly yε

‘Kofi danced quickly.’

b. Kofi saa \*(yε) ampa.

Kofi dance.PST yε truly

‘Its truly the case that Kofi danced.’

We typically think of *do*-support as a morphologically driven phenomenon that targets the higher regions of clause structure. Twi *yε*-insertion, however, does not appear to fit this mold – for it is neither obviously morphologically motivated (it is a free morpheme that does not serve as a base of affixal attachment) nor is it structurally high in any clear sense. Despite its formal similarity with the ‘do’ form in the language, I argue in this article that *yε*-

insertion in Twi is less an instance of *do*-support and more accurately an instance of prosodically conditioned verbal resumption'. Following the Match theory of syntactic-prosodic constituency correspondence (Selkirk 2006, 2009, 2011), I propose that phono-syntactic constituency matching requires, at the minimum, avoidance of phonetically empty transferred syntactic constituents (i.e. prosodic vacuity). I show that Twi verbal resumption is highly constrained and occurs precisely in those contexts where a prosodically vacuous domain would otherwise be mapped from a fully evacuated syntactic domain. As a measure of last resort, a late default-form insertion of a lower copy of the verb root (the  $y\varepsilon$  form) occurs to evade prosodic vacuity and ensure a matching correspondence between syntactic and prosodic constituents at PF. Because an additional higher copy of the verb root (i.e. the lexical verb) survives as well, Twi verbal resumption represents an instance of multiple copy spell-out. This has broad theoretical consequences. As an instance of multiple copy interpretation at PF, Twi  $y\varepsilon$ -insertion provides an opportunity to supplement the growing catalog of forces known to drive multiple copy realization at the syntax-phonology interface (cf. Kandybowicz 2008). With respect to prosodic mapping, Twi  $y\varepsilon$ -insertion provides evidence for the existence of a PF constraint banning phonetically null (i.e. vacuous) spell-out domains, a constraint that follows logically from the Match theory, as I will discuss.

This article has considerable descriptive consequences as well. First, it challenges conceptions of  $y\varepsilon$  in the Twi literature. Existing accounts of  $y\varepsilon$  treat the morpheme as either an additional exponent of past tense (Boadi 1966,

Dolphyne 1988), an exponent of completive aspect (Osam 2003), or a contextual allomorph of the past tense morpheme (Ofori 2006). Either way, these approaches view  $y\epsilon$  as an exceptional instance of verb suffixation<sup>3</sup> in a language that is predominantly prefixal<sup>4</sup>. Concerning the purported past suffix, Dolphyne (1988: 93-94) writes:

“This is the only suffix in the verbal forms...There are two different realisations of this suffix depending on whether or not the verb is followed by an object or a complement...Where the verb is not immediately followed by an object or a complement, a Low tone suffix...occurs after the stem. In Asante the suffix has two alternative forms, either the high front vowel  $-i/-e$  or  $-y\epsilon$ , and in each case the suffix is preceded by a long vowel...Where the verb is immediately followed by an object or a complement...the suffix does not occur.”

I am unaware of any existing treatment that views  $y\epsilon$  through the lenses of verbal resumption and late insertion, as conceptualized in this article. As such, my analysis of  $y\epsilon$  might seem controversial when considered against the backdrop of the existing Twi literature. However, any potential controversy is offset, I believe, by the wealth of correct predictions this perspective brings to bear on the language, predictions which lead to several new discoveries concerning the syntax of Asante Twi. I enumerate these new findings, which I take to be the work's second descriptive consequence, throughout the course of the paper.



The organization of the article is as follows. Section two details those aspects of Twi clause structure that are essential for deriving the distribution of  $y\epsilon$ . It is primarily concerned with the cartography of the Twi middle field, which has yet to receive a formal systematic treatment in the literature. Section three returns to the distribution of non-thematic  $y\epsilon$  and, based on the analysis of Twi clause structure proposed in section two and a closer look at the facts, offers a descriptive generalization covering a wide range of data, both previously established and newly discovered, namely: the spell-out domain of  $v^0$  must have content at PF, otherwise  $y\epsilon$  is inserted to supply that content. In section four, I derive this descriptive generalization from deeper principles concerning prosodic mapping. Section five concludes the article with a summary and brief closing remarks.

## 2. Twi Clause Structure

A number of important insights into Twi clause structure accompany the examination of  $T^0_{\text{PAST}}$ . The head has two realizations depending on whether or not aspect is encoded: a null variant occurs when the clause contains no marking of aspect and a High tone bearing *na* variant surfaces exclusively in conjunction with aspect. These two expressions of  $T^0_{\text{PAST}}$  are illustrated in (7) below.

- (7) a. Kofi kɔɔ dwaso. (\*Na Kofi kɔɔ dwaso.)  
 Kofi go.PST market  
 'Kofi went to the market.'

- b. Na Kofi a-kɔ dwaso. (\*Na Kofi kɔ dwaso.)  
 PST Kofi PRF-go market  
 ‘Kofi had gone to the market.’

Not all Twi linguists make this two-way distinction. Osam (2003), for instance, treats *na* in (7b) as an adverb rather than a true tense morpheme, pointing out that it is homophonous with the form meaning ‘then’ that surfaces in conditionals. Telling evidence against Osam’s analysis of *na*, however, comes from extraction facts. Unlike true adverbials in the language, which may be focused (cf. (8b) below), sentence-initial *na* resists movement\* (cf. (8d)), as expected of a true tense morpheme.<sup>9</sup>

- (8) a. ɛnora Kofi kɔɔ dwaso.  
 yesterday Kofi go.PST market  
 ‘Yesterday Kofi went to the market.’
- b. ɛnora na Kofi kɔɔ dwaso.  
 yesterday FOC Kofi go.PST market  
 ‘It was YESTERDAY that Kofi went to the market.’
- c. Na Kofi a-kɔ dwaso.  
 PST Kofi PRF-go market  
 ‘Kofi had gone to the market.’

- d. \*Na na Kofi a-kɔ dwaso.  
       PST FOC Kofi PRF-go market

One potential explanation of (8d)'s ungrammaticality that would be consistent with Osam's claim would involve an appeal to haplology. Along these lines, one could maintain that *na* is in fact an adverbial expression, but due to the fact that it is homophonous with the focus marker (though see note 9), it may not be focused because doing so would yield identical adjacent *na na* sequences at PF. Evidence against such an appeal is furnished by examples like (9) below, which illustrate that the locative object in (8c) is capable of undergoing focus movement, yielding a grammatical surface *na na* string.

- (9) Dwaso na na Kofi a-kɔ.  
       market FOC PST Kofi PRF-go  
       'It was THE MARKET that Kofi had gone to.'

Although segmentally null, one important phonological reflex of  $T^0_{\text{PAST}}$  can be detected. This reflex sheds light on the structure of the Twi clause as well as its derivation. When the null variant occurs and no overt head intervenes between  $T^0$  and  $V^0$ , the predicate's final segment (typically, a vowel) is lengthened/copied (cf. (10a)). However, when an overt head (such as negation<sup>10</sup> (cf. (10b)) or aspect (cf. (10c))) intervenes, the verb's final segment is obligatorily short. (See Dolphyne 1988 and Paster 2010 for more details.)

- (10) a. Kofi saa yε. (\*Kofi sa yε.)  
 Kofi dance.PST yε  
 ‘Kofi danced.’
- b. Kofi n-sa. (\*Kofi n-saa.)  
 Kofi NEG-dance.HAB  
 ‘Kofi does not dance.’
- c. Kofi re-sa. (\*Kofi re-saa.)  
 Kofi PROG-dance  
 ‘Kofi is dancing.’

These facts suggest that Twi verbs raise to  $T^0$  unless blocked by an overt/contentful head (cf. Aboh 2004 on Gbe) and that when the verb occupies  $T^0_{\text{PAST}}$ , it is spelled out with an additional mora (cf. Kobele & Torrence 2006). In this way, segment-final lengthening on a verb can serve as a diagnostic for  $V^0$ -to- $T^0$  movement. Unfortunately, the standard tests for  $V^0$ -to- $T^0$  raising are not applicable in the language because Twi lacks verb phrase-initial adverbial modifiers (Saah 2004:70) and does not tolerate quantifier float in vP-internal subject positions (more on the latter in section 2.2 below).

Word order facts in sentences with overt  $T^0_{\text{PAST}}$ , in which an aspect marker obligatorily co-occurs with the past tense morpheme, also shed considerable light on Twi clause structure. When the two co-occur, the subject must follow  $T^0$  and

precede aspect. Furthermore, because the verb fails to raise to  $T^0$ , it is spelled-out with an obligatorily short vowel. And as first exemplified by the data in (3b,d), when  $T^0_{\text{PAST}}$  and aspect co-occur,  $y\epsilon$  may not accompany the verb. This is illustrated first in sentences (11a-c) below and then again in (11d-f) with a different predicate and aspect marker.

- (11) a. Na Kofi re-sa (\*yε).  
           PST Kofi PROG-dance  
           ‘Kofi was dancing.’
- b. \*Kofi na re-sa (\*yε).  
           Kofi PST PROG-dance
- c. \*Na re- Kofi sa (\*yε).  
           PST PROG Kofi dance
- d. Na Ama a-kɔ dwaso (\*yε).  
           PST Ama PRF-go market  
           ‘Ama had gone to the market.’
- e. \*Ama na a-kɔ dwaso (\*yε).  
           Ama PST PRF-go market

f. \*Na a- Ama kɔ dwaso (\*yε).

PST PRF Ama go market

Although these word order facts might suggest that *na* has raised from  $T^0$  to  $C^0$ , co-occurrence facts in embedded clauses tell otherwise. The example below shows that *na* is not in complementary distribution with  $C^0$  and thus that the two items do not compete for the same syntactic position.

(12) Yaw kaa sɛ na Kofi re-sa.

Yaw say.PST COMP PST Kofi PROG-dance

'Yaw said that Kofi was dancing.'

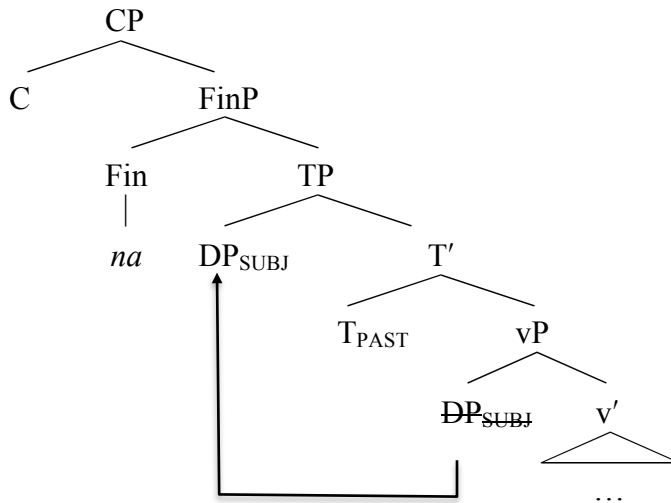
What, then, is the proper analysis of the *na* construction in terms of the positions occupied by the tense marker and the subject? As it turns out, answering this question unlocks the structure of the Twi middle field.

### 2.1. *The Structure of the Na Construction*

The acceptability of (12) above reveals that the pre-subject position of *na* is not  $C^0$ . Eliminating this analytical possibility, two analyses of *na* would seem equally reasonable at this point. One would involve locating the item in a low left peripheral head above  $T^0$ , for instance, FinP (Rizzi 1997). On this approach, one could remain agnostic as to whether *na* was base-generated in this position or

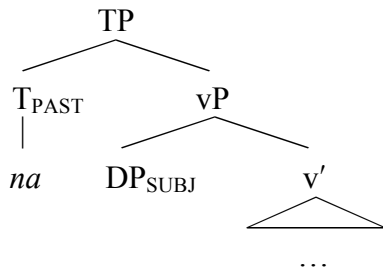
moved there from  $T^0$ . Crucially, *na* would be hierarchically superior to the subject in Spec,  $T^0$ , correctly deriving the word order facts in (11). Call this Analysis A:

- (13) Analysis A: *na* occupies a left peripheral head; subject is below in Spec,  $T^0$ .



A contending analysis, call it Analysis B, would generate *na* directly in  $T^0$  and account for the linear order of the tense marker and subject by locating the latter vP-internally. This is illustrated below.

- (14) Analysis B: *na* occupies  $T^0$ ; subject is below, in-situ.



On Analysis B, movement of the subject to Spec, T<sup>0</sup> would be suspended, presumably due to an exceptional absence of EPP features on *na*<sup>11</sup>.

## 2.2. Deciding between Analyses A and B

The crucial difference between Analyses A and B concerns the position of the subject. On analysis A, the subject has raised, occupying Spec, T<sup>0</sup>. On Analysis B, the subject is unmoved, occupying its base-merge position, Spec, v<sup>0</sup>. The distribution of floated quantifiers in the language provides a means for locating the syntactic position of the subject in the *na* construction.

In Asante Twi, quantifiers like *nkoara* ‘only’ follow the DPs they quantify (15a). When their associate DPs are displaced, quantifiers may either be pied-piped (15b) or stranded (15c). However, when stranded, the quantifier must be accompanied by a preceding strong resumptive pronoun agreeing in phi-features with the displaced associate.

(15) a. Kofi a-bɔ [Ama nkoara].

Kofi PRF-kick Ama only

‘Kofi has kicked only Ama.’

b. [Ama nkoara] na Kofi a-bɔ \_\_\_\_.

Ama only FOC Kofi PRF-kick

‘It was ONLY AMA that Kofi has kicked.’



c. Ama na Kofi a-bɔ \*(ɔno) nkoara.

Ama FOC Kofi PRF-kick 3<sup>RD</sup>.SG only

‘It was only AMA that Kofi has kicked.’

The data in (15) above illustrate that Q-float is possible in object position. Similar facts reveal that quantifier stranding is also possible in the *surface* subject position, Spec, T<sup>0</sup>.

(16) a. [Kofi nkoara] a-bɔ Ama.

Kofi only PRF-kick Ama

‘Only Kofi has kicked Ama.’

b. [Kofi nkoara] na \*(w)-a-bɔ Ama.

Kofi only FOC 3<sup>RD</sup>.SG-PRF-kick Ama

‘It was ONLY KOFI that has kicked Ama.’

c. Kofi na \*(ɔno) nkoara a-bɔ Ama.

Kofi FOC 3<sup>RD</sup>.SG only PRF-kick Ama

‘It was only KOFI that has kicked Ama.’

Example (16a) shows once again that quantifiers follow their associates. (16b) introduces a new and important wrinkle. A quantifier may be pied piped, as

before, but when the [DP + Q] constituent is extracted from the surface subject position, a weak resumptive pronoun must mark the launching site of movement, a pattern typical of subject extraction in the language more generally. (In the case of (16b), the weak third person singular pronominal /ɔ-/ surfaces as [w-] due to phonological reasons relating to hiatus resolution.) Sentence (16c) illustrates the previous pattern observed in object position quantifier float – when stranded, Q must be preceded by resumptive *no*, the strong form of the third person singular pronoun. Comparable facts obtain in the progressive aspect. The data in (17) below recapitulate the pattern in (16), illustrating once more that Q-float in Asante Twi is tolerated in Spec, T<sup>0</sup>, the surface subject position.

- (17) a. [Kofi nkoara] rɛ-bɔ Ama.  
           Kofi only    PROG-kick Ama  
           ‘Only Kofi is kicking Ama.’
- b. [Kofi nkoara] na ɔ-rɛ-bɔ Ama.  
           Kofi only    FOC 3<sup>RD</sup>.SG-PROG-kick Ama  
           ‘It is ONLY KOFI that is kicking Ama.’
- c. Kofi na \*(ɔno) nkoara rɛ-bɔ Ama.  
           Kofi FOC 3<sup>RD</sup>.SG only    PROG-kick Ama  
           ‘It is only KOFI is kicking Ama.’

An interesting twist emerges, however, when we consider quantifier float in vP-internal subject positions. Despite the availability of Q-float in the surface subject position, Twi prohibits quantifier stranding in Spec, vP. The data below illustrate.

(18) a. \*Kofi bɔɔ [<sub>vP</sub> ɔno nkoara Ama].

Kofi kick.PST 3<sup>RD</sup>.SG only Ama  
 ‘Only Kofi kicked Ama.’

b. \*Kofi saa [<sub>vP</sub> ɔno nkoara yɛ].

Kofi dance.PST 3<sup>RD</sup>.SG only yɛ  
 ‘Only Kofi danced.’

To recap, quantifier stranding is attested in Asante Twi, but it is restricted from occurring in the vP-internal subject position. This fact can now be pressed into service in choosing between Analyses A and B. To do so, we will consider the predictions made by both analyses for Q-float in the *na* construction.

Although they differ in where they locate the subject in the *na* construction, Analyses A and B both correctly predict the unavailability of subject-oriented quantifier stranding in *na* clauses.

(19) a. Na [Kofi nkoara] a-bɔ Ama.

PST Kofi only PRF-kick Ama  
 ‘Only Kofi had kicked Ama.’

b. \*Na Kofi ɔno nkoara a-bɔ Ama.

PST Kofi 3<sup>RD</sup>.SG only PRF-kick Ama

‘Only Kofi had kicked Ama.’

c. \*Na Kofi a- ɔno nkoara bɔ Ama.

PST Kofi PRF 3<sup>RD</sup>.SG only kick Ama

‘Only Kofi had kicked Ama.’

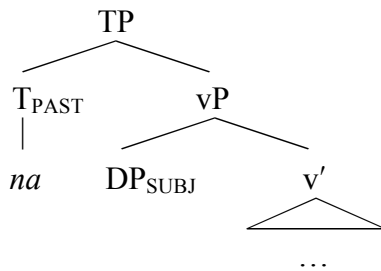
The absence of the strong resumptive element *no* reveals that the quantifier has not been stranded in (19a). By contrast, the examples in (19b-c) involve subject-oriented quantifier float and as such, are ungrammatical. On Analysis A (cf. (13)), where *na* is located in a left peripheral head just above the moved subject in Spec, T<sup>0</sup>, the ungrammaticality of (19b-c) follows from the independently established restriction on floated quantifiers in Spec, v<sup>0</sup>. On Analysis B (cf. (14)), where *na* is located in T<sup>0</sup> and the subject is in-situ in Spec, v<sup>0</sup>, the unavailability of quantifier stranding follows from the fact that the subject is unmoved in the construction. Without subject movement, the syntactic context for pronominal resumption, which recall, licenses the stranded quantifier, is bled. In this way, both analyses successfully predict the impossibility of subject-oriented quantifier float in neutral *na* constructions. The two approaches, however, make different predictions with respect to subject-oriented quantifier stranding in *na* constructions with focus.

The pivotal question is whether quantified subjects may be focused in the *na* construction, stranding their associate quantifiers. Because the launching site of this movement would be Spec, T<sup>0</sup> under Analysis A (cf. (13)), a position independently shown to host Q-float in the language (cf. (16c), (17c)), the analysis would predict the possibility of subject-oriented quantifier stranding in subject-focused *na* constructions. By contrast, the launching site of subject focus movement under Analysis B (i.e. Spec, v<sup>0</sup> (cf. (14))) is not a position independently known to support stranded quantifiers. Thus, Analysis B makes the opposite prediction – subject-oriented quantifier stranding should be impossible in *na* constructions with focused subjects. The data below show that Analysis B’s prediction is borne out. Subject-oriented quantifier float is not possible when the subject has been focused in a *na* construction (20c).

- (20) a. Na [Kofi nkoara] a-bɔ Ama.  
       PST Kofi only PRF-kick Ama  
       ‘Only Kofi had kicked Ama.’
- b. [Kofi nkoara] na na w-a-bɔ Ama.  
       Kofi only FOC PST 3<sup>rd</sup>.SG-PRF-kick Ama  
       ‘It was ONLY KOFI that had kicked Ama.’
- c. \*Kofi na na ɔno nkoara a-bɔ Ama.  
       Kofi FOC PST 3<sup>rd</sup>.SG only PRF-kick Ama  
       ‘It was only KOFI that had kicked Ama.’

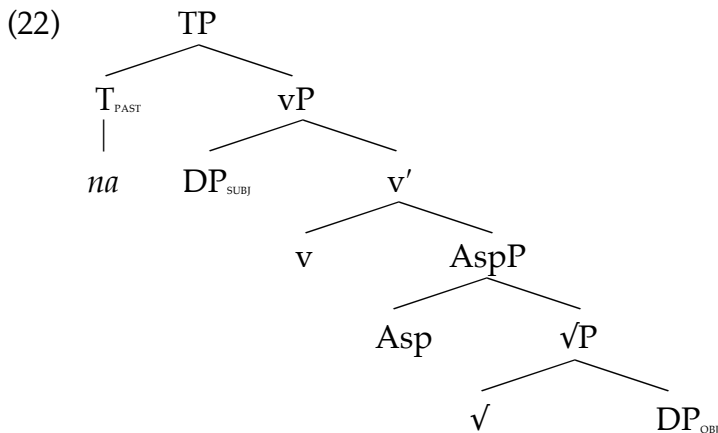
We thus have motivation to reject Analysis A in favor of Analysis B. The adopted structural analysis of the tense marker and subject in the *na* construction under Analysis B is presented below (repeated from (14)).

(21) Analysis B: *na* occupies T<sup>0</sup>; subject appears in-situ in Spec, v<sup>0</sup>.



### 2.3. Structural Implications of Analysis B

The reason the *na* construction unlocks the clause structure of Twi is that it affords us a rare opportunity to observe the subject in a low position in the middle field. Recall that in the *na* construction, subjects obligatorily precede aspect markers (cf. (11a) vs. (11c) and (11d) vs. (11f)). If the subject is vP-internal when *na* spells out T<sup>0</sup><sub>PAST</sub>, as in Analysis B, then it follows that aspect must be expressed fairly low in the Twi clausal hierarchy (i.e. below v<sup>0</sup>)<sup>2</sup>. This low vP-internal aspect position corresponds to “inner aspect<sup>13</sup>” (Travis 1991, 2010, Pearson 2001), an independently motivated functional projection within the verb phrase shell structure. Based on these considerations, then, the following gross structure for the Twi middle field emerges.



Building on the current analysis, we can elaborate on the structure in (22) by considering the hierarchical position of negation. We have seen that negation follows the subject and blocks segment-final lengthening in simple past verbs (cf. (10b)). This is consistent with an analysis in which Neg<sup>o</sup> is situated somewhere below T<sup>o</sup> (contra Kobele & Torrence 2006), blocking head movement of the verb into T<sup>o</sup>. The data in (23a-c) below, in which the pre-verbal negative morpheme *n-* obligatorily follows both the subject in Spec, v<sup>o</sup> and the aspect marker in the *na* construction suggests that negation is expressed fairly low in the language – *below* inner aspect in the verb phrase. While this hierarchical positioning of negation may seem odd from a Euro-centric perspective, low vP-internal analyses of negation have recently been motivated in a variety of languages by different researchers (Kamali & Samuels 2008, Kahnemuyipour & Kornfilt 2011, Su 2012). The low hierarchical positioning of negation is not limited to the *na* construction, however. Whenever negation and overt aspect co-occur, the former always follows the latter, as illustrated in (23d-e).

(23) a. Na Kofi re-**n**-sa.

PST Kofi PROG-NEG-dance

‘Kofi was not dancing.’

b. \*Na Kofi **n**-re-sa.

PST Kofi NEG-PROG-dance

c. \*Na **n**- Kofi re-sa.

PST NEG Kofi PROG-dance

d. Kofi a-**n**-sa.

Kofi PERF-NEG-dance

‘Kofi did not dance.’

e. \*Kofi **n**-a-sa.

Kofi NEG-PERF-dance

Putting it all together, then, the structure and derivation of the Twi middle field I’ve argued for is presented below in (24) – (26). The structure in (24) represents a negative monotransitive sentence in the past tense, a construction formed by way of a null past tense morpheme in  $T^0$  and an obligatory perfect marker *a-* in  $Asp^0$ . Because the two heads immediately dominating the verb root are filled by  $Neg^0$  and  $Asp^0$ , verb movement is blocked, preventing the verb from



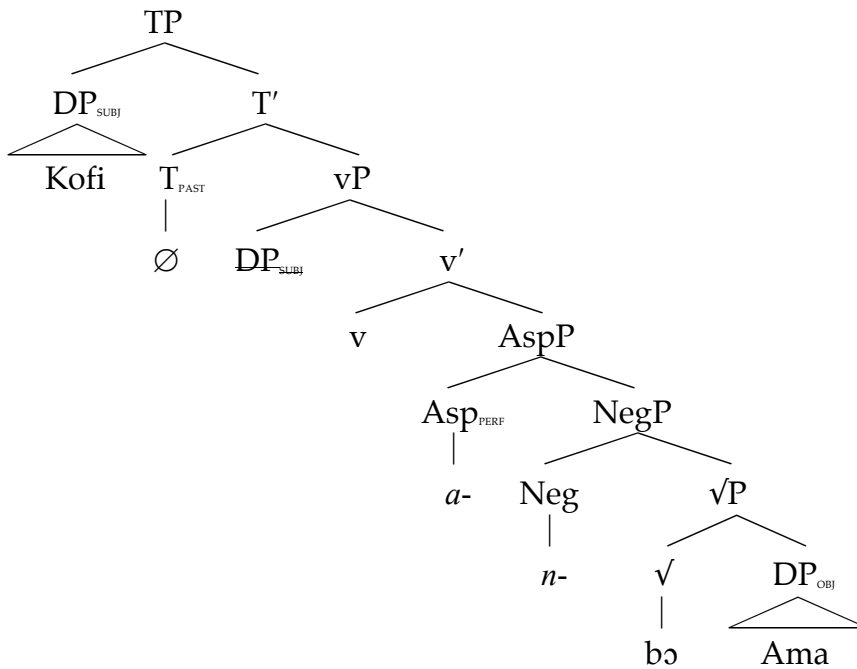
reaching  $T^0$  and subsequently ensuring that it surfaces vP-internally with a short vowel.

(24) The structure of a negative past tense monotransitive construction

Kofi a-n-bɔ Ama.

Kofi PERF-NEG-kick Ama

'Kofi did not kick Ama.'



By way of contrast, the tree in (25) below represents the structure of an affirmative monotransitive construction in the simple past tense. I assume that affirmative structures fail to project NegP and thus, because no overt tense or

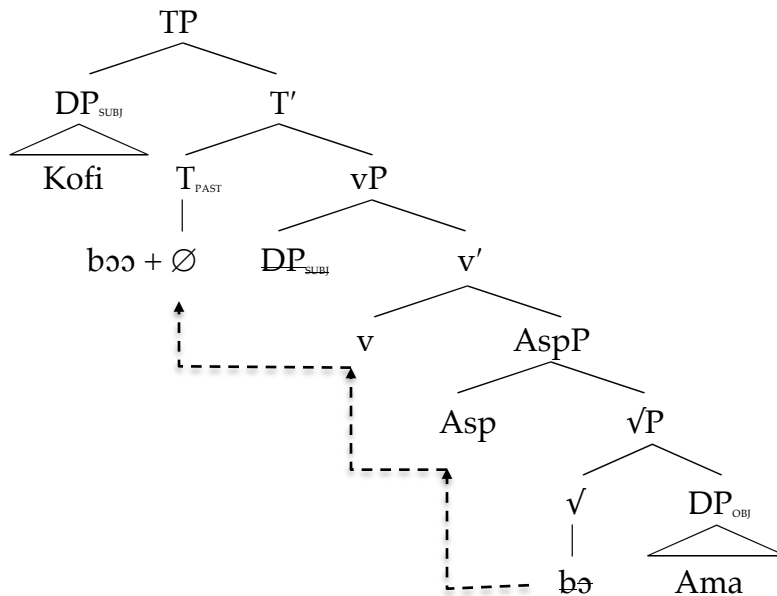
aspect morphemes have been merged in this case, the verb can successfully raise to  $T^0$ , feeding segment-final vowel lengthening at PF.

(25) The structure of an affirmative simple past monotransitive construction

Kofi bɔɔ Ama.

Kofi kick.PST Ama

'Kofi kicked Ama.'



And to conclude, the structure of a negative monotransitive construction in the past perfect is given in (26). Here we find all expressions surfacing in their base-generated positions: the subject appears vP-internally below the tense marker due to absence of EPP features on  $T^0_{na}$  and the overt exponents of  $T^0_{PAST}$ ,  $Asp^0_{PERF}$  and

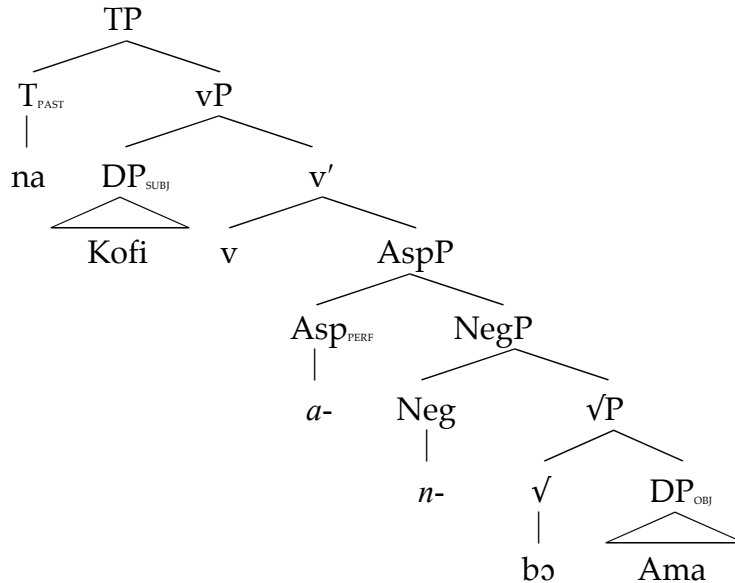
negation block the verb from raising out of  $\sqrt{P}$ . Consequently, the verb fails to escape vP and is phonetically realized with a short vowel.

(26) The structure of a negative past perfect monotransitive construction

Na Kofi a-n-bɔ Ama.

PST Kofi PERF-NEG-kick Ama

'Kofi had not kicked Ama.'



### 3. Revisiting the Facts: A Closer Look at the Distribution of $y\epsilon$

The syntactic considerations of the previous section give way to a more focused characterization of the  $y\epsilon$ -insertion facts. Cross-referencing the data in (1)-(6) with the structural analyses sketched in (24) – (26), a generalization emerges

concerning the distribution of  $y\epsilon$ . Assuming the architecture of the derivation by phase framework (Chomsky 2000, 2001),  $y\epsilon$ -insertion is obligatory whenever AspP, the spell-out domain (SOD) of the  $v^0$  phase head, would otherwise be empty at PF. Put another way,  $y\epsilon$ -insertion into an AspP-internal head circumvents the violation of  $*[\text{SOD } \emptyset]$ , a PF constraint prohibiting phonetically vacuous spell-out domains that I propose in this article<sup>14</sup>. The basic facts presented at the outset of the article serve to reinforce this view. In the affirmative simple past (cf. (1), repeated below), intransitive verb roots raise to  $T^0$ , creating vacant AspP structures if all chain links apart from the chain heads are deleted at PF (i.e. the typical outcome of chain resolution (Nunes 1999, 2004)).  $y\epsilon$ -resumption in this case provides a work-around.

- (27) a. Kofi saa         $*(y\epsilon)$ .  
           Kofi dance.PST  $y\epsilon$   
           ‘Kofi danced.’
- b. Dua no shii     $*(y\epsilon)$ .  
           tree the burn.PST  $y\epsilon$   
           ‘The tree burned.’

By contrast, when verb movement is blocked entirely, such as when an inner aspect head is merged (cf. (3a-e), repeated below in (28a-e)) or when perfect-accompanying negation is structured in (cf. (4a), also repeated below in (28f)), the

verb is phonetically realized in its base-generated position within AspP, obviating the insertion of  $y\epsilon$ .

- (28) a. Kofi a-sa/shi (\* $y\epsilon$ ). (Perfect)  
 Kofi PRF-dance/burn  $y\epsilon$   
 'Kofi has danced/burned.'
- b. Na Kofi a-sa/shi (\* $y\epsilon$ ). (Past perfect)  
 PST Kofi PERF-dance/burn  $y\epsilon$   
 'Kofi had danced/burned.'
- c. Kofi re-sa/shi (\* $y\epsilon$ ). (Present progressive)  
 Kofi PROG-dance/burn  $y\epsilon$   
 'Kofi is dancing/burning.'
- d. Na Kofi re-sa/shi (\* $y\epsilon$ ). (Past progressive)  
 PST Kofi PROG-dance/burn  $y\epsilon$   
 'Kofi was dancing/burning.'
- e. Kofi taa-sa/shi (\* $y\epsilon$ ). (Habitual)  
 Kofi HAB-dance/burn  $y\epsilon$   
 'Kofi dances/burns (habitually).'

f. Kofi a-n-sa/shi (\*yε).

Kofi PERF-NEG -dance/burn yε

‘Kofi did not dance/burn.’

With verbal complements, whether DPs or CPs (cf. (5), repeated below), a similar set of considerations are at play. Because they independently provide PF content to AspP regardless of whether V<sup>0</sup>-to-T<sup>0</sup> movement takes place, the need for yε insertion is obviated.

(29) a. Kofi bɔɔ (\*yε) Ama (\*yε).

Kofi kick.PST yε Ama yε

‘Kofi kicked Ama.’

b. Kofi rε-bɔ (\*yε) Ama (\*yε).

Kofi PROG-kick yε Ama yε

‘Kofi is kicking Ama.’

c. Yaw kaa (\*yε) sε Kofi bɔɔ (\*yε) Ama (\*yε).

Yaw say.PST yε COMP Kofi kick.PST yε Ama yε

‘Yaw said that Kofi kicked Ama.’

- d. Yaw a-ka (\*yε) sε Kofi taa-bɔ (\*yε) Ama (\*yε).  
 Yaw PRF-say yε COMP Kofi HAB-kick yε Ama yε  
 ‘Yaw has said that Kofi kicks Ama (habitually).’

Lastly, the differing effects of adverbs on *yε*-insertion (cf. (6), repeated below) follow entirely on this account from considerations of attachment/scope.

- (30) a. Kofi saa (\*yε) ntεm (\*yε).  
 Kofi dance.PST yε quickly yε  
 ‘Kofi danced quickly.’

- b. Kofi saa \*(yε) ampa.  
 Kofi dance.PST yε truly  
 ‘Its truly the case that Kofi danced.’

Low manner adverbs like *ntεm* ‘quickly’ in (30a) are presumably AspP-internal (Ernst 2002). As such, they supply PF content to AspP at spell-out, rendering *yε*-insertion unnecessary. Higher attaching speaker-oriented adverbs like *ampa* ‘truly’ (cf. (30b)), on the other hand, take scope over propositions and thus attach well outside the AspP constituent. Since they are AspP-external, they do not provide phonetic content to the SOD in any way. And as such, they fail to obviate *yε*-insertion.

This particular way of conceptualizing Twi verbal resumption thus seems initially promising. In addition to the considerations of the previous paragraph, a wide range of empirical evidence supports the generalization that  $y\epsilon$ -insertion is a strategy to repair vacuous spell-out domains at PF. We turn now to this evidence.

### 3.1 Cases Where Linear Order is Irrelevant

A simple alternative to the generalization expressed above can be found in the existing Twi literature. Osam (2003) treats  $y\epsilon$  as a contextual allomorph of the completive suffix that surfaces if and only if an intransitive past tense-inflected verb form appears clause-finally. That is,  $y\epsilon$ -insertion is linked directly to linear order on this approach. Osam's analysis successfully accounts for  $y\epsilon$ -insertion following past-inflected intransitives. It also derives the obviation of  $y\epsilon$ -insertion in intransitive aspectual constructions because in these cases the verb root's failure to raise to  $T^0$  prevents it from being inflected for past tense, despite occurring sentence-finally. Osam's approach can also account for the obviation of  $y\epsilon$ -insertion in negative intransitive constructions in a similar fashion, since here too the predicate fails to reach  $T^0$  and thus does not inflect for past tense. Because Twi is an SVO language, Osam derives the obviation of  $y\epsilon$ -insertion by surface objects/complements. Osam's approach also correctly predicts that post-verbal modifiers obviate  $y\epsilon$ -insertion in intransitive constructions as well, since



their inclusion would effectively disrupt the linear order that would otherwise feed  $y\varepsilon$ -insertion.

- (31) Kofi saa (\* $y\varepsilon$ ) kɔmm (\* $y\varepsilon$ ).  
 Kofi dance.PST  $y\varepsilon$  quietly  $y\varepsilon$   
 ‘Kofi danced quietly.’

However, Osam’s analysis breaks down when sentence-final AspP-external modifiers are considered. The example in (32) below (repeated from (6b)) shows that clause-final modifiers attaching higher than AspP fail to obviate  $y\varepsilon$ -insertion, a consideration unnoticed by Osam.

- (32) Kofi saa \*( $y\varepsilon$ ) ampa.  
 Kofi dance.PST  $y\varepsilon$  truly  
 ‘Its truly the case that Kofi danced.’

Osam’s linear analysis wrongly predicts the impossibility of  $y\varepsilon$ -insertion in cases like (32), where a sentence-final adverb removes the context for insertion. When post-verbal adverbs take scope over entire propositions and not just AspPs, however,  $y\varepsilon$ -insertion is obligatory despite the fact that the verb is non-final in the clause. This shows that Twi verbal resumption is sensitive to hierarchical structure and not linear order, as Osam claims. A revision of Osam’s

generalization in line with the observed data would be to say that that  $y\epsilon$  is inserted in the completive aspect when it occurs *AspP-finally*.

There is further evidence that linear order is irrelevant, all based on data previously unreported in the literature. Clause-final interrogative particles fail to obviate  $y\epsilon$ -insertion in intransitive constructions. The sentence below shows that  $y\epsilon$ -insertion is obligatory even though the past tense-inflected predicate is not clause-final.

(33) Kwame wuu \*( $y\epsilon$ ) anaa?

Kwame die.PST  $y\epsilon$  INT

‘Did Kwame die?’

The \*[<sub>soD</sub>  $\emptyset$ ] theory of  $y\epsilon$ -insertion advanced above easily accommodates this fact. If *anaa* is a left peripheral Q operator (as seems reasonable), then the AspP in (33) would surface as a vacant domain at PF if not for the insertion of  $y\epsilon$ .

Markers of coordination also fail to obviate  $y\epsilon$ -insertion. The example below shows that  $y\epsilon$  is obligatory in the initial conjunct, despite the fact that its intransitive predicate does not appear in an otherwise sentence-final position.

(34) Kwaku dii \*( $y\epsilon$ ) na ɔ-daa \*( $y\epsilon$ ).

Kwaku eat.PST  $y\epsilon$  and 3<sup>rd</sup>.SG-sleep.PST  $y\epsilon$

‘Kwaku ate and slept.’

This fact as well follows from the current proposal, assuming a TP coordination analysis of (34), such as the one in (35) below.

(35) [<sub>CoordP</sub> [<sub>TP</sub> *Kwaku dii yε*] [<sub>Coord'</sub> *na* [<sub>TP</sub> *ɔ-daa yε*]]]

Under such an analysis, the verbs of both TP conjuncts would successfully raise to T<sup>0</sup><sub>PAST</sub>, leaving behind potentially vacant AspPs. In the usual manner, *yε*-resumption at PF improves an otherwise defective structure.

Similarly, particles following relative clauses do not obviate the insertion of *yε*, even though they create a linear context where the predicate is no longer clause-final.

(36) ɔbarima no na ɔ-daa \*(yε) no  
 boy the COMP 3<sup>rd</sup>.SG-sleep-PST *yε* CL DET  
 ‘The boy who slept’

If we understand the particle *no* following the relative clause above to be a clausal determiner (as seems reasonable given its syntactic position and homophony with the definite determiner), then it occupies an AspP-external position. The obligatory insertion of *yε* in this case is thus entirely expected. Because the relative clause-internal intransitive verb has raised to T<sup>0</sup>, the relative clause-internal AspP will be vacant at PF unless *yε*-insertion applies.

These considerations strengthen the case for conceptualizing Twi  $y\epsilon$ -insertion in terms of hierarchical structure, as opposed to linear order. The data in (32)-(36) exemplify instances where, despite appearances to the contrary, a vacant AspP structure correlates with verbal resumption. In (32), the post-verbal propositional modifier *ampa* attaches higher than AspP. In (33), the interrogative particle *anaa* scopes well over AspP in  $C^0$ . In (34), the coordinator *na* operates outside the AspP domain to conjoin two clauses. And in (36), the clausal determiner *no* scopes over the embedded clause containing AspP. In all four cases, the verb roots have raised to  $T^0$  and the post-verbal functional material exists outside AspP. In all four cases, AspP has no PF content independent of  $y\epsilon$ .

### 3.2 Cases Where Movement Plays a Role

Another novel finding concerning the distribution of  $y\epsilon$  is that its insertion is not actually limited to intransitive clauses in the simple past, as proposed by Osam. The hypothesis that  $y\epsilon$ -insertion in Twi repairs an otherwise illicit AspP structure at PF (i.e. one with no phonetic content) is strengthened by cases involving both  $V^0$ -to- $T^0$  movement and object extraction in transitive constructions. In these cases, the evacuation of all AspP-internal material creates outputs that are potentially problematic at PF under the  $*[\text{soD } \emptyset]$  account. As predicted,  $y\epsilon$ -insertion is obligatory when both verb raising to  $T^0$  and object extraction occur and it is obviated either when the object appears in-situ or the verb fails to raise to  $T^0$ . The

data in (37) illustrate these facts. (37a) shows that  $y\epsilon$ -insertion is unavailable when an object *wh*- expression remains in situ, despite the verb having raised to  $T^0$ . The very same sentence requires  $y\epsilon$ -insertion, however, when the *wh*- element undergoes movement to the left periphery (37b). In an aspectual construction other than the simple past, where verb movement to  $T^0$  does not proceed and as a consequence the predicate is spelled-out AspP-internally, the surface position of the object has no bearing on  $y\epsilon$ -insertion. This is exemplified by the present progressive sentences in (37c-d). In these cases,  $y\epsilon$ -insertion is blocked regardless of whether or not the object undergoes extraction.

- (37) a. Ama dii (\* $y\epsilon$ )  $\epsilon$ de $\epsilon$ n (\* $y\epsilon$ )?  
 Ama eat.PST  $y\epsilon$  what  $y\epsilon$   
 ‘What did Ama eat?’
- b.  $\epsilon$ de $\epsilon$ n na Ama dii — \*( $y\epsilon$ )?  
 what FOC Ama eat.PST  $y\epsilon$   
 ‘What did Ama eat?’
- c. Ama re-di (\* $y\epsilon$ )  $\epsilon$ de $\epsilon$ n (\* $y\epsilon$ )?  
 Ama PROG-eat  $y\epsilon$  what  $y\epsilon$   
 ‘What is Ama eating?’

- d.     εdeɛn na Ama re-di \_\_\_ (\*yɛ)?  
           what FOC Ama PROG-eat     yɛ  
           ‘What is Ama eating?’

These facts are fully general, as illustrated by the (contrastive) non-*wh*-focus movement data in (38) and (39) below. Once again, unmoved objects in the simple past block *yɛ*-insertion (cf. (38a)) because they provide content to the inner Aspect Phrase at PF, rendering insertion unnecessary. When they are moved in conjunction with  $V^o$ -to- $T^o$  raising (cf. (38b)), however, *yɛ*-resumption once again correlates with an otherwise vacant AspP structure at PF. And as before, object extraction feeds *yɛ*-insertion only in the case of the simple past tense (compare (38b) with (38d)) because it is only in the simple past tense that the verb root escapes vP.

- (38) a.     Ama nomm (\*yɛ) nsuo (\*yɛ).  
           Ama drink.PST yɛ water yɛ  
           ‘Ama drank water.’
- b.     Nsuo na Ama nomm \_\_\_ \*(yɛ).  
           water FOC Ama drink.PST     yɛ  
           ‘It is WATER that Ama drank.’

- c. Ama re-nom (\*yε) nsuo (\*yε).  
 Ama PROG-drink yε water yε  
 ‘Ama is drinking water.’
- d. Nsuo na Ama re-nom \_\_\_ (\*yε).  
 water FOC Ama PROG-drink yε  
 ‘It is WATER that Ama is drinking.’

Lastly, consider the consequences of the interaction between  $V^0$ -to- $T^0$  raising and object extraction in ditransitive structures. In Twi, it is not possible to focus multiple XPs in a single clause, but it is possible to focus either the goal or the theme in a double object construction. As our analysis predicts, neither derivation should feed  $y\epsilon$ -insertion because the unmoved object (whether goal or theme) will remain AspP-locked, providing content to the AspP spell-out domain of  $v^0$  at PF. This prediction is borne out, as illustrated below in (39).

- (39) a. Kofi brεε Ama sika.  
 Kofi bring.PST Ama money  
 ‘Kofi brought Ama money.’
- b. Ama na Kofi brεε (\*yε) sika (\*yε).  
 Ama FOC Kofi bring.PST yε money yε  
 ‘It was AMA who Kofi brought money to.’

- c. Sika na Kofi brɛɛ (\*yɛ) Ama (\*yɛ).  
 money FOC Kofi bring.PST yɛ Ama yɛ  
 ‘It was MONEY that Kofi brought Ama.’

### 3.3 Cases Involving Other AspP-Internal Items

Patterns involving modifiers, null object pronouns and bi-morphemic verbs further suggest the influence of a PF constraint banning phonetically empty AspP structures in the language. First, consider the consequences of the locus of modification. As previously discussed, when the verb root raises to  $T^0_{PAST}$ , only low AspP-internal modifiers obviate  $yɛ$ -insertion. As illustrated below, hierarchically low manner adverbials like *ntɛm* ‘quickly’ and *komm* ‘quietly’ remove the context for  $yɛ$ -insertion (40a), while higher-attaching adjuncts such as temporal modifiers (e.g. *ɛnora* ‘yesterday’ (40b)) and speech act-oriented expressions (e.g. *ampa* ‘truly’ (40c)) do not<sup>15</sup>.

- (40) a. Kofi saa (\*yɛ) ntɛm/komm (\*yɛ).  
 Kofi dance.PST yɛ quickly/quietly yɛ  
 ‘Kofi danced quickly/quietly.’
- b. Kofi saa \*(yɛ) ɛnora.  
 Kofi dance.PST yɛ yesterday  
 ‘Kofi danced yesterday.’



- c. Kofi saa \*(yε) ampa.  
 Kofi dance.PST yε truly  
 'Its truly the case that Kofi danced.'

Further evidence that Twi verbal resumption is driven by avoidance of prosodically vacuous AspP spell-out domains is found in pronominal object constructions. Third person singular inanimate object pronouns in the language are phonetically null, as shown below.

- (41) a. Yaw a-wɔ <∅>.  
 Yaw PERF-pound 3<sup>RD</sup>.SG.INAN  
 'Yaw has pounded it.'
- b. Yaw rε-hwε <∅>.  
 Yaw PROG-look 3<sup>RD</sup>.SG.INAN  
 'Yaw is looking at it.'

Unlike overt objects (cf. (42c)), however, null pronominals do not obviate *yε*-insertion when the verb raises to T<sup>0</sup> in the simple past, as shown below in (42a-b). This once again suggests that the operative condition on *yε*-insertion is PF-centric, rather than syntactic.

(42) a. Yaw wɔɔ <Ø> \*(yɛ).

Yaw pound.PST 3<sup>RD</sup>.SG.INAN yɛ

'Yaw pounded it.'

b. Yaw hwɛɛ <Ø> \*(yɛ).

Yaw look.PST 3<sup>RD</sup>.SG.INAN yɛ

'Yaw looked at it.'

c. Yaw hwɛɛ (\*yɛ) me (\*yɛ).

Yaw look.PST yɛ 1<sup>ST</sup>.SG yɛ

'Yaw looked at me.'

Supporting evidence can also be found in the domain of two-part verbs. Twi has a rich inventory of complex predicates, among them, inherent complement verbs and split verbs. Some examples appear below.

(43) a. to ndwom (Inherent complement verb)

throw song

'to sing'

b. di agoro (Inherent complement verb)

eat game

'to play'

- c.     to   fom   (Inherent complement verb)  
        fall ground  
        'to fall'
- d.     pa   kyεw    (Split verb)  
        beg -beg  
        'to beg'

In the simple past, only the initial piece of the complex predicate is inflected/lengthened, suggesting that it alone vacates the verbal domain. This is illustrated in (44) below for the split verb variety.

- (44) a.   Kofi paa    kyεw.   (\*Kofi paa kyεww.)  
        Kofi beg.PST -beg  
        'Kofi begged.'
- b.   Kofi paa    Ama kyεw.   (\*Kofi paa Ama kyεww.)  
        Kofi beg.PST Ama -beg  
        'Kofi begged Ama.'

This fact entails that  $*[\text{sub } \emptyset ]$  will always be satisfied in two-part verb constructions regardless of tense or aspect, making the prediction that  $y\epsilon$ -insertion should be systematically obviated in bi-morphemic intransitive verb

constructions. As predicted, when used intransitively in the simple past, two-part verbs neither require nor trigger  $y\epsilon$ -insertion because the second morpheme provides content to the AspP domain. Consider the facts in (45) below.

(45) a. Kofi too (\* $y\epsilon$ ) ndwom (\* $y\epsilon$ ).

Kofi throw.PST  $y\epsilon$  song  $y\epsilon$

'Kofi sang.'

b. Kofi dii (\* $y\epsilon$ ) agoro (\* $y\epsilon$ ).

Kofi eat.PST  $y\epsilon$  game  $y\epsilon$

'Kofi played.'

c. Kofi tɔɔ (\* $y\epsilon$ ) fom (\* $y\epsilon$ ).

Kofi fall.PST  $y\epsilon$  ground  $y\epsilon$

'Kofi fell.'

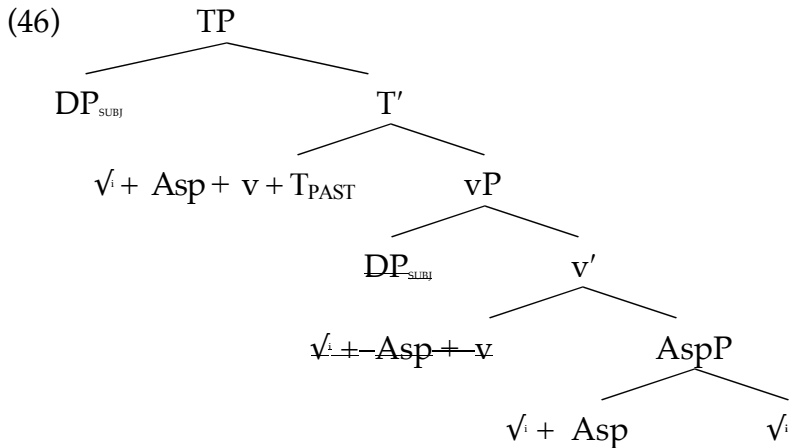
d. Kofi paa (\* $y\epsilon$ ) kyew (\* $y\epsilon$ ).

Kofi beg.PST  $y\epsilon$  -beg  $y\epsilon$

'Kofi begged.'

#### 4. Deriving the Distribution of $y\epsilon$ from Prosodic Mapping

Assuming the architecture of the derivation by phase framework, I've argued that the distribution of  $y\epsilon$  is systematic and predictable if we also assume the existence of an active PF constraint banning prosodically vacuous spell-out domains. Twi  $y\epsilon$ -insertion is tied exclusively to the affirmative simple past because it is in this construction alone that the lexical verb both escapes and is pronounced outside AspP, the spell-out domain of Twi's  $v^0$  phase. The canonical PF outputs of intransitive, object extraction and null object constructions violate this constraint when the verb raises to  $T^0$  (i.e. in the affirmative simple past), unless  $y\epsilon$  is inserted inside AspP to provide content to the spell-out domain at PF. The precise hierarchical position targeted by  $y\epsilon$ -insertion is difficult to ascertain on purely empirical grounds. Assuming the clause structure argued for in section 2 and repeated below, there are two eligible head positions that could potentially serve as the locus of verbal resumption and thus, provide content to the lower spell-out domain when the verb has raised to  $T^0_{PAST}$ : Asp<sup>0</sup> and  $v^0$ . These heads host lower copies of the root morpheme, one of which I claim is spelled out as the impoverished/default (in the sense of Bonet 1991 and Halle 1997) verb form  $y\epsilon$ , assuming the Distributed Morphology hypothesis of competitive late insertion (Halle & Marantz 1993, Marantz 1994, Halle 1997).



The choice of which head hosts  $y\varepsilon$  cannot be made on the basis of word order alone, however, since in all instances of verbal resumption, no item intervenes between the past-inflected verb in  $T^0$  and  $y\varepsilon$ . Thus, the insertion of  $y\varepsilon$  into any of these two heads will both satisfy the language's anti-vacuity constraint and yield the attested word order facts.  $Y\varepsilon$ -insertion has the character of a last resort repair strategy in the language – it is obviated when the verb, an object, an aspect marker, a negative morpheme, or a modifier surfaces AspP-internally to supply prosodic content to the transferred structure.

Given its syntactic status as a spell-out domain, it follows that AspP constitutes a major prosodic domain (i.e. phonological phrase) in Twi (Dobashi 2003; Selkirk 2006; Adger 2007; Ishihara 2007; Kratzer & Selkirk 2007; Kahnemuyipour 2009; Revithiadou & Spyropoulos 2009; Sato 2009, among others). The question that arises naturally at this point, then, is why major prosodic domains are policed for prosodic vacuity. In this section, I speculate on

the motivation for Twi's anti-vacuity constraint, seeking to derive the output condition from deeper principles concerning prosodic mapping.

I propose that Selkirk's (2006, 2009, 2011) Match theory of syntactic and prosodic constituency correspondence provides the insight needed to understand why an anti-vacuity constraint emerges in the grammar of Twi. Match theory articulates the view that the constituent structures of syntax and phonology correspond to or mirror each other. In informal terms, this entails that the edges or boundaries of syntactic constituents (be they words, phrases or clauses) must correspond with the edges of their related prosodic counterparts (prosodic words, phonological phrases and intonational phrases, respectively). For the purposes of this article, the match relation between a syntactic XP and a phonological phrase ( $\varphi$ ) is relevant.

(47) MATCH PHRASE (Selkirk 2011): Match (XP,  $\varphi$ )

A phrase in syntactic constituent structure must be matched by a corresponding prosodic constituent  $\varphi$  in the phonological representation. The left and right edges of syntactic constituent XP must correspond to the left and right edges of prosodic constituent  $\varphi$  in the output phonological representation.

Because prosodic domain formation requires at the bare minimum overt prosodic content (i.e. the absence of phonetic content precludes the formation of an accompanying prosodic domain), a necessary condition for syntactic-prosodic constituency correspondence is the avoidance of prosodic vacuity. In other

words, for a given syntactic XP and its corresponding phonological phrase to match in the way prescribed by (47), the spell-out of XP must be phonetically contentful. Otherwise, XP will not be prosodically mapped and a syntactic constituent will have no corresponding prosodic counterpart at PF. In the case of the Twi  $v^0$  phase, a phonetically empty AspP structure will fail to trigger prosodic domain formation and subsequently, without the construction of its corresponding phonological phrase, Match Phrase (AspP,  $\varphi$ ) will be violated. To remedy this state of affairs, verbal resumption into either Asp<sup>0</sup> or  $v^0$  takes place, providing the prosodic content that feeds  $\varphi$  formation, thus facilitating syntactic-prosodic constituency correspondence upon spell-out of the lower phase. Note that Match theory on its own makes no claim about prosodic vacuity avoidance. That is, there is nothing in the theory that explicitly says “no prosodic constituent should be empty”. I take the ban on null transferred domains to be a consequence of prosodic mapping, derived as a *corollary* of Match under a strong reading of (47). In this way, the proposal connects with other treatments of edge/domain-emptiness in the literature (e.g. An 2007a,b, Kandybowicz 2009) that seek to ground vacuity avoidance in terms of prosodic mapping and alignment.

In Optimality Theoretic terms, Twi’s Match Phrase constraint must either be undominated or at least fairly high-ranked; otherwise, constraints penalizing the insertion of material not present in the input (i.e. DEP) would block the insertion of  $y\varepsilon$  and consequently yield prosodically empty AspP structures. Despite its status in Twi, Match Phrase (or any of the Match family of constraints,



for that matter) is not universally undominated. We find that cross-linguistically, prosodically empty spell-out domains are not as strictly policed as they are in Twi. In French, for instance, a language with independently motivated  $V^0$ -to- $T^0$  movement (Pollock 1989), intransitive verbs may freely raise out of the verbal domain without the accompanying insertion of default prosodic material to facilitate syntactic-prosodic constituency matching. This entails that Match Phrase and its corollary  $*[\text{soD } \emptyset ]$  are violable constraints. In languages like Twi, the constraints are absolute, whereas in languages like French they may be sacrificed in order to comply with higher ranked prosodic markedness requirements. Cross-linguistic variation with respect to prosodic vacuity, then, follows from the differential ranking of Match Phrase in relation to other active language-specific prosodic markedness constraints, as dictated by Match Theory and Optimality Theory more generally.

## 5. Concluding Remarks

This article makes a case for the avoidance of vacuity in prosodic mapping. Assuming the correspondence of syntactic and prosodic constituent structure, as postulated under the Match Theory, it follows that matching requires, at the minimum, avoidance of phonetically empty transferred syntactic structures. Otherwise, a narrow syntactic constituent will fail to be prosodically mapped and will consequently have no corresponding prosodic counterpart at PF in violation of the Match condition (47). If, in a given language, avoidance of

prosodic vacuity is a low PF priority (as in French, for example), syntactically vacant transferred XPs will be spelled-out with no accompanying prosodic repairs or modifications. But if a language prioritizes vacuity avoidance at PF, then a syntactically evacuated spell out domain will be prosodically vulnerable, militating the invocation of some language-specific PF repair strategy.

This issue comes to a head in Asante Twi, where in certain simple past tense constructions an otherwise empty AspP structure is repaired by the late insertion of a resumptive verb form (the item  $y\varepsilon$ ), a last resort PF operation that facilitates syntactic-prosodic constituency correspondence. Twi  $y\varepsilon$ -insertion, I claim, is more accurately an instance of lower copy pronunciation, in which a categorially neutral root morpheme that has raised through the head positions of AspP and beyond is spelled out as an impoverished/default verb form. Other vocabulary items compete with  $y\varepsilon$  for insertion (including the lexical verb root from the numeration), but only the insertion of default  $y\varepsilon$  yields a well-formed PF output in the language. (I assume that distinctness conditions on linearization (cf. Nunes 1999, 2004 and Richards 2010) block the realization of a low repeated/non-distinct copy of the original verb root and force the item  $y\varepsilon$  to surface instead.) Furthermore, because an additional (higher) copy of the root morpheme is realized in  $T^0$  in these constructions (i.e. as the lexical verb form), Twi verbal resumption can also be analyzed as an instance of multiple copy spell-out, an otherwise marked PF outcome.

Because of its PF profile in these respects, Twi verbal resumption contributes to the growing catalog of conditions known to drive multiple copy realization at the syntax-phonology interface (cf. Kandybowicz 2008), while deepening our understanding of the nature and inner workings of prosodic mapping. I consider these contributions to be noteworthy given the limited impact of Twi grammar on the theoretical literature thus far and the fact that *yε*-insertion has remained an otherwise neglected corner of its grammar.

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## NOTES

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\* The data presented in this article comes exclusively from fieldwork and is presented in the official unified orthography of the language. In keeping with orthographic convention, tone is not marked, though it is discussed in the text when relevant. The following abbreviations are used in the glosses of example sentences: CL DET – clausal determiner; COMP – complementizer; FOC – focus; HAB – habitual; INAN – inanimate; INT – interrogative particle; NEG – negation; PL – plural; PRF – perfect; PROG – progressive; PRT – particle; PST – past; SG – singular.

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<sup>1</sup> Twi has been argued to be a primarily aspectual language, with only a binary past/non-past distinction for T heads (Osam 2008, Kusmer 2010). The language expresses most non-past readings using aspectual morphology, as in (3a-e), but

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encodes future orientation periphrastically by means of the motion verb *bε* ‘to come’ in combination with a main verb (cf. (3f-g)). Future constructions in the language thus appear to be serial verb constructions. Because I am interested in the consequences of main verb raising to  $T^0$  and the creation of phonetically empty syntactic domains in this article, I will not concern myself with the periphrastic future tense in what follows.

<sup>2</sup> In Twi, habitual aspect can also be encoded via a phonetically null  $Asp_{HAB}$  head, which has no tonal consequences for the realization of the verb (Paster 2010). Thus, when the verb occupies null-headed  $Asp^0_{HAB}$  it surfaces in its underlying form. Because the patterns with respect to  $yε$ -insertion do not vary from those in (3) when habitual aspect is zero-marked, I will set aside the case of the zero habitual in this article.

<sup>3</sup> A reviewer asks whether the complementizer may be dropped in Twi and if so, whether  $yε$ -insertion would be forced. The answer is no. Apart from quotative constructions, Twi complementizers may not be dropped. When V takes a clausal complement, as in (5c-d),  $yε$ -insertion is systematically obviated.

<sup>4</sup> Note that resumption (of pronominal elements (cf. (15c), (16b-c))) is independently attested in the language, making verbal resumption less anomalous than might be regarded at first blush.

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<sup>5</sup> Despite the fact that these analyses agree on the morphological status of  $y\epsilon$  as a verbal suffix, they make contradictory claims about the phonological implications of the item's affixal status. For example, Dolphyne (1988) describes an alternation in which  $y\epsilon$  surfaces as either  $-y\epsilon$ ,  $-i$ , or  $-e$ , based on harmonization with the preceding stem vowel (see the quote above), while Osam (2003) claims that no such vowel harmony occurs on the  $y\epsilon$  form. Ofori 2006 and Paster 2010 also contain descriptions of the vowel alternation in  $y\epsilon$ . On the basis of my observations, Dolphyne's characterization appears to be more accurate than Osam's. The item  $y\epsilon$  undergoes regular ATR harmony with the preceding verb stem vowel. (See note 7 below.)

<sup>6</sup> Note that it is conceptually plausible to analyze verbal vowel lengthening in the past tense (cf. (1)) as involving the suffixation of a phonetically empty timing slot (Ofori 2006) that is filled by way of linking segmental material from the verb stem (Kobele & Torrence 2006, Paster 2010). In this way, the exponent of  $T_{\text{PAST}}^0$  would in fact be a suffix ( $/-X/$ ), but it would not change the fact that (overt) suffixation in the language is rare.

<sup>7</sup> In this article, I will not concern myself with the surface phonological realization of what I'm representing as  $y\epsilon$ , which due to processes involving vowel harmony and epenthesis surfaces sometimes as  $[e, i]$  and other times as  $[j\epsilon]$ , as captured in the description of this passage. Instead, I collapse the two realizations into the single written representation  $\langle y\epsilon \rangle$ .

<sup>8</sup> In this way, conditional *na* and past aspectual *na* pattern alike. Neither can undergo focus movement, which is consistent with their status as functional heads.

<sup>9</sup> Despite appearances to the contrary, the past tense morpheme *na* is not homophonous with the focus marker *na*. The former bears a High tone. The latter is Low tone bearing.

<sup>10</sup> The one exception to this generalization occurs in the negative of perfect constructions, where unlike simple past constructions that build negative forms by combining perfect *a-* with Neg<sup>o</sup> (cf. (ia)), the negative is built by combining null T<sup>o</sup><sub>PAST</sub> with Neg<sup>o</sup> without a mediating perfect aspect marker (Schachter & Fromkin 1968, Saah 1994, Dolphyne 1996, Ofori 2006) (cf. (ib)). In this case, the verb does in fact surface with a lengthened final segment, despite the presence of Neg<sup>o</sup>.

(i) a. Kofi a-n-tɔ bi.

Kofi PERF-NEG-buy some

‘Kofi did not buy something.’

b. Kofi n-tɔɔ bi.

Kofi NEG-buy.PST some

‘Kofi has not bought something.’

I analyze the blocking of segment-final lengthening on the verb in negative constructions to be a consequence of Asp<sup>o</sup>. When merged in a negative

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construction (cf. (ia), (10b)), final lengthening is blocked. When  $\text{Asp}^0$  is not merged in the narrow syntax (cf. (ib)), final lengthening may occur. Under an analysis in which final lengthening is contingent on  $V\text{-T}^0_{\text{PAST}}$  (see below), this would mean that Twi verbs may raise through  $\text{Neg}^0$ , but not through filled  $\text{Asp}^0$ .

<sup>11</sup> The EPP impoverishment of *na* may simply be an interim synchronic property connected to the item's recent grammaticization from what Osam (2003) has analyzed as a conditional/adverbial particle. The prediction of this speculation would be that over time, as the item evolves into a fully regular tense marker, it would acquire the EPP features typically borne by tense morphemes and at that point in the evolution of the language, subjects would precede *na*.

<sup>12</sup> Unless, of course, the vP-internal subject were to move to a higher vP-external  $\text{AspP}$  specifier position. This movement would successfully derive the correct linear order of subject before aspect without relying on a low position for  $\text{Asp}^0$ , but at the cost of relying on an unmotivated/ad hoc movement. Furthermore, it is not clear that such a structure/analysis would successfully account for the impossibility of subject-oriented quantifier float in *na* constructions with focused subjects, given that the stranded quantifier would be vP-external following the movement of the subject to Spec,  $\text{Asp}^0$ . For these reasons, I take the low aspect analysis adopted above to be more principled than an alternative analysis that seeks to position  $\text{Asp}^0$  higher in the clausal hierarchy.

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<sup>13</sup> Following Smith (1991), Travis (2010) makes a distinction between “viewpoint aspect” and “situation aspect”. Whereas the latter refers to Aktionsart or aspectual verb classes such as Activity, State, Accomplishment, etc., viewpoint aspect is morphosyntactic (i.e. grammatical) aspect and covers categories such as perfective and imperfective. For Travis (2010), inner aspect is the province of situation aspect, while viewpoint aspect is encoded vP-externally within the inflectional domain of the clause. Thus, the claim that viewpoint aspectual categories like perfect, progressive and habitual are encoded vP-internally in Twi may appear inconsistent with Travis’ proposal. On the contrary, although inner aspect is primarily related to situation aspect in her system, Travis concedes that in some languages the vP-internal aspect projection may host material that is more viewpoint-oriented than situational. As examples of such cases, Travis cites Navajo aspectual morphology, progressive reduplicants in Tagalog and completive suffixes in Tagalog and Malagasy. (See Travis 2010 (chapters 3 & 7) for detailed discussion of these cases.) Twi thus appears to be another such language that encodes (at least some) viewpoint aspect vP-internally.

<sup>14</sup> In this way, the presence of  $y\epsilon$  tracks the phonological emptiness of AspP. Other languages have different mechanisms for tracking the content of this constituent. One example is Zulu, which utilizes a morphological alternation on the verb to encode whether a verb phrase has content at PF or not, apart from the verb. In Zulu, the so-called “disjoint” verb form tracks empty verb phrases. It appears when both subjects and objects have vacated the verb phrase, leaving

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behind an empty constituent apart from the verbal head. The “conjoint” verb form, on the other hand, is used whenever one of these operations fails to occur, that is, when the verb phrase has PF content beyond the verb. Of course, this description is somewhat over-simplified. See Buell 2006, 2008 for more on the Zulu conjoint/disjoint alternation and how it can be pressed into service to probe whether a given base-generated vP constituent is internal or external to vP at PF.

<sup>15</sup> Although upper middle field modifiers such as subject-oriented adverbs like ‘foolishly’ or ‘confidently’ would be predicted to force  $y\varepsilon$ -insertion on this analysis, they do not have the same post-verbal distribution as the adverbials considered above. Rather, they appear sentence-initially and as such, do not play a decisive role in distinguishing the present analysis from Osam’s linear approach.

A reviewer asks whether the low adverbs *ntem* ‘quickly’ and *komm* ‘quietly’ allow both subject-oriented and manner readings, as in English, and if so, whether only the manner readings of such adverbs obviate  $y\varepsilon$ -insertion, as predicted by the present analysis. While the predictions of the current proposal are clear and unambiguous, I unfortunately lack the data to answer this question and leave it for future research.