

On the Structure and Derivation of Twi Multi-Verb Constructions:  
Serialization Despite Multiple Clauses

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ABSTRACT

In this paper I discuss multi-verb constructions in Asante Twi. Of particular interest are sentences containing two verbs, but lacking an overt coordinator.

- (1) Ama wɔɔ bayerɛ no dii aburo no  
Ama pound-PST yam DET eat-PST corn DET  
'Ama pounded the yam and ate the corn.'
- (2) Kofi kyii akɔla no bɔɔ no  
K catch-PST child DET beat-PST 3<sup>rd</sup>.SG  
'Kofi caught the child and beat it.'
- (3) Ama wɔɔ bayerɛ no dii yɛ  
Ama pound-pst yam DET eat-pst do  
'Ama pounded the yam and ate it.'

Such sentences have been widely documented cross-linguistically and are often identified as Covert Coordination (CC) when two overt objects are present ((1) and (2)) or Serial Verb Constructions (SVCs) when consecutive verbs lack overt objects (3). Despite considerable documentation, SVCs lack a unified typological description or structural definition. Baker (1989) proposes a double-headed VP in which ternary branching accommodates  $V_1 + \text{OBJ} + V_2$ . Collins (1997) posits a VP shell structure in which  $V_2$  merges with an empty category *pro* and  $V_1$  merges with the overt object. Aboh (2009) argues that lexical  $V_2$  introduces the internal and external arguments and merges with functional  $V_1$ , after which certain elements undergo movement resulting in the surface word order of  $V_1 + \text{OBJ} + V_2$ .

This paper provides a description and structural account of multi-verb constructions in Twi. Extraction in the form of predicate clefting differentiates between coordinate and non-coordinate constructions, a task which has been neglected in the literature, and elucidates the structure of non-coordinating constructions. A coordinate structure does not permit predicate clefting of either verb whereas a non-coordinate structure permits clefting of  $V_1$ , but not  $V_2$ , suggesting an asymmetry within the clause.

I conclude that constructions such as (2) and (3) are best explained by the analysis offered by Aboh (2009)— $V_1$  is functional and  $V_2$  is lexical. Only the lexical  $V_2$  introduces the object and movement derives the  $V_1 + \text{OBJ} + V_2$  surface word order. I further find that the presence of tense/aspect marking on both verbs in Twi constructions requires the projection of each verb to extend to the TP level. This seems to prevent such constructions from being labeled as SVCs in the traditional sense; mono-clausality has been cited as a defining feature in much of the literature. However, assuming a cross-linguistic account of SVCs as structures in which  $V_1$  is lexical and  $V_2$  is functional, the definition of SVCs could be broadened to include structures with consecutive verbs projecting to TP. Observed differences in tense/aspect marking on verbs could thus be explained by parametric differences specifying the extent to which  $V_2$  projects.

My analysis also contributes to recent work on the Twi middle-field (Kandybowicz 2010), showing that though an overt pronoun follows  $V_2$  in constructions like (2), this

pronoun can be accounted for by the necessity that the edge of a Spell-Out domain be pronounced in Twi; thus (2) and (3) are structurally similar.

### 1. Introduction

Sentences with multiple verbs and no overt coordinators exist in Asante Twi, a member of the Kwa subgroup of the Niger-Congo language family spoken in the southern half of Ghana<sup>1</sup>.

- (1) Ama wɔɔ bayerɛ no dii aburo no  
 A pound-PST yam DET eat-PST corn DET  
 ‘Ama pounded the yam and ate the corn.’
- (2) Kofi kyii akɔla no bɔɔ no  
 K catch-PST child DET beat-PST 3<sup>rd</sup>.SG  
 ‘Kofi caught the child and beat it.’
- (3) Ama wɔɔ bayerɛ no dii yɛ<sup>2</sup>  
 A pound-PST yam DET eat-PST do  
 ‘Ama pounded the yam and ate it.’

Sentences like (3) have been called Serial Verb Constructions (SVCs) from the early documentation of Twi, such as Christaller (1875), to the present. Considering that SVCs are widely attested and studied in languages of West Africa, it is not surprising that multi-verb constructions in Twi and Akan<sup>3</sup>, are deemed cases of serialization. They indeed exhibit many of the traditional descriptive features of SVCs:

- (a) Two or more finite verbs without an overt connective or conjunction
- (b) Verbs that share the same subject and/or object
- (c) Verbs that exhibit ‘missing’ arguments
- (d) Verbs that do not differ in tense/polarity

However, an interesting property of Twi multi-verb constructions is the obligatory marking of tense/aspect/polarity on all verbs in the constructions while only one marker of these elements is generally observed in SVCs in other languages. While some accounts do not permit each verb to be marked for tense/aspect/polarity in an SVC (e.g. Collins 1997), others use a single marker as a less firm constraint, thereby not necessarily excluding

<sup>1</sup> All data presented, unless otherwise noted, was collected exclusively from fieldwork with native speakers of Asante Twi and is presented in the official unified orthography of the language. Tones are not marked, except in relevant cases. The following abbreviations are used in the glosses of example sentences: COMP – complementizer; COMPL – completive; CONS – consecutive; COORD – coordinator; DEF – definite; DET – determiner; FOC – focus; FUT – future; INF – infinitive; NEG – negation; NML – nominal; P – postposition; PL – plural; POSS – possessive; PRF – perfect; PROG – progressive; PRT – particle; PS – plural subject; PST – past; SG – singular; SS – singular subject.

I would like to especially thank my consultants, Peter Owusu-Opoku, Isaac Opoku, Duke Kwadwo Yeboah and David Opoku, students of Swarthmore College as well as Nathan Shelton and Leland Kusmer, fellow students of Haverford and Swarthmore, whose discussion greatly aided my research. I also express gratitude to Jason Kandybowicz, without whose direction and supervision this thesis would not have been possible.

<sup>2</sup> Contrary to previous literature (e.g. Osam 2003), I treat *yɛ* as a form of do-insertion rather than an element of the past tense or completive aspect, based on Kandybowicz (2010).

<sup>3</sup> The Akan people comprise a particular ethnic group of West Africa. The term ‘Akan’ is also used to describe the range of dialects spoken by the Akan people, of which Twi is a specific one.

constructions in which multiple markers appear (e.g. Baker 1989). Still, as we will see, Twi exhibits an unexpected distribution of such markers in this respect.

Also intriguing is the realization of an overt pronoun following consecutive verbs in some multi-verb constructions, even when objects are co-referent (cf. (2)). The presence of an overt pronoun after  $V_2$  is sometimes used to distinguish between coordinate and serializing structures (Baker 1989), but most of the Akan literature simply attributes the presence of this overt pronoun to object animacy (e.g. Hellan et al. 2003), maintaining the serializing status of examples like (2).

Thus, multi-verb constructions in Twi exhibit some puzzling features that motivate structural analysis as well as re-investigation of their serializing status. In this thesis, I consider a particularly relevant issue to Twi multi-verb constructions: the distribution of tense/aspect/negation markers and pronominal realization. In addition, I address other issues prevalent in the characterization of multi-verb constructions throughout the literature. The most prominent of these are the investigation of coordinate structures vs. mono-clausal structures and the nature of object sharing. The consequences of my analysis are two-fold. First, my investigation differs considerably from other approaches in the current literature on multi-verb constructions in Twi. I apply a range of diagnostic tests to determine structure and derivation, an approach that is not exhaustively applied in previous research on Twi. The second consequence of my analysis is that it contributes to research on SVCs cross-linguistically by providing a syntactic derivation of Twi multi-verb constructions, which is currently lacking in the literature.

As we will see, Twi multi-verb constructions are best explained by an analysis of TP subordination. Though an analysis in which multiple verbs project to the TP level departs considerably from traditional definitions of serialization, which stipulate that the construction be mono-clausal, I find that my analysis of the Twi data, modeled after Aboh (2009) is compatible with an analysis of serialization. Indeed, the proposed analysis suggests that constructions exhibiting features similar to SVCs should not be deemed non-serializing simply due to the presence of tense/aspect markers on multiple verbs. I further propose that as the search for a unified typological definition of SVCs continues, an Aboh-style (2009) analysis be considered due to its ability to explain the observed variation in tense/aspect marking on verbs in SVCs cross-linguistically—parametric differences specify the nature of the extended projection of consecutive verbs.

The organization of this thesis is as follows. Section 2 provides a background to multi-verb constructions, including a discussion of diagnostic tests used to differentiate coordinate from non-coordinate structures, a summary of prominent structural analyses of multi-verb constructions, and a review of current literature regarding multi-verb constructions in Akan. Section 3, the empirical core of the thesis, discusses multi-verb constructions in Twi with particular attention to pronominal realization, extraction, tense/aspect/polarity marking, and the distribution of adverbials. In Section 4, I discuss the structural implications of these findings, proposing a syntactic derivation of multi-verb constructions in Twi. Section 5 concludes the thesis.

## 2. Multi-Verb Constructions: A Background

As the primary aim of this thesis is to characterize multi-verb constructions in Twi, this section is devoted to discussing the relevant literature on SVCs and multi-verb constructions. I divide this section into three parts, beginning with the introduction of traditional diagnostic tests used to identify SVCs and differentiate them from coordinated structures. I then provide a description of several prominent structural analyses of SVCs and multi-verb constructions such as those proposed by Larson (2010), Baker (1989),

Collins (1997), Hiraiwa and Bodomo (2008), Aboh (2009), and Stewart (2001). I conclude with an account of Akan-specific analyses of multi-verb constructions.

### 2.1 Diagnostic Tests for SVCs

Diagnostic tests are often used to determine whether a construction is more accurately an instance of serialization or coordination. Prosodic evidence is cited frequently (e.g. Stewart 2001); serializing constructions do not exhibit inter-clausal pauses or domain-final tonal patterns (e.g. boundary tones/sandhi) that coordinate structures do. Most diagnostic tests, however, are syntactic in nature. The most prominent of these is extraction in the forms of *wh*/focus movement and predicate clefting. Further tests, such as predicate clefting combined with object pied-piping and insertion of overt pronouns purport to identify object sharing constructions. The aforementioned syntactic tests are discussed in the following section.

Despite differing opinions on defining features and structures of SVCs, it is generally agreed upon that a construction is not an SVC if it involves the coordination of two (or more) clauses. Thus, extraction is used to determine whether a construction is an SVC. If an argument of the verb within an SVC can be extracted by *wh*/focus movement, a coordinate structure can be ruled out due to the Coordinate Structure Constraint of Stahlke (1970). If, however, a construction exhibits island effects during extraction of a verb's argument, the construction might not be representative of a single clause. Relevant Gungbe examples from Aboh (2009: 5, 6) appear below<sup>4</sup>.

- (4) a. Sɛsinu na kun moto ce sɔ ado!  
 S FUT drive car 1<sup>st</sup>.SG.POSS hit wall  
 'Sesinou will drive my car hit the wall!' (Author's translation)
- b. Etɛ wɛ Sɛsinu na kun sɔ ado?  
 what FOC S FUT drive hit wall  
 'What will Sesinou drive hit the wall?' (Author's translation)
- c. Etɛ wɛ Sɛsinu na kun moto ce sɔ?  
 what FOC S FUT drive car 1.SG.POSS hit  
 'What will Sesinou drive my car hit?' (Author's translation)
- (5) a. Sɛsinu ɖa lɛsi bɔ Suru ɖu nusɔnu.  
 S cook rice COORDS eat soup  
 'Sesinou cooked rice and Suru ate soup.' (Author's translation)
- b. \*Etɛ<sub>i</sub> wɛ Sɛsinu ɖa t<sub>i</sub> bɔ Suru ɖu  
 What FOC S cook COORDS eat  
 nusɔnu?  
 soup  
 'What did Sesinou cook and Suru ate soup?' (Author's translation)

<sup>4</sup> All data from other authors is presented without intonation marked, but otherwise appears in its original form.

*Wh* movement is acceptable in (4b) and (4c), which suggests that both verbs are members of the same clause. However, ungrammaticality ensues in (5b) when *wh* movement is attempted. This is due to the presence of a coordinate structure.

Extraction in the form of predicate clefting is also used to distinguish between coordinate structures and serializing structures. According to Baker (1989:514, 549), when predicate clefting is possible from an SVC, the verbs involved are head verbs. It follows from this that if a construction allows predicate clefting of multiple verbs, the verb chain must have multiple heads, which is defining of SVCs for Baker (1989). A coordinate structure, on the other hand, does not exemplify this double-headedness and therefore should not allow predicate clefting of a single or multiple predicates.

An additional form of extraction can be used as a diagnostic test for object sharing. Predicate clefting combined with object pied-piping, though not available in all languages, is cited by Hiraiwa and Bodomo (2008) as a test to determine whether an object forms a constituent with a verb. In Dàgáárè, a serializing construction allows the object to be pied-piped with either  $V_1$ ,  $V_2$  or  $V_1 + V_2$ , which is taken to be evidence that the object forms a syntactic constituent with both verbs and the construction thus exemplifies object sharing. Examples from Hiraiwa and Bodomo (2008:805, 806) appear below.

- (6) a. o da sɛ la nɛne ɔɔ  
 3<sup>rd</sup>.SG Pst roast FOC meat eat  
 'He roasted meat and ate it.'
- b. nɛne seɛo la ka o sɛ ɔɔ  
 meat roast.NML FOC COMP 3<sup>rd</sup>.SG roast eat  
 'It is roasting meat that he did and ate (as opposed to e.g. boiling yam).'
- c. nɛne ɔɔɔ la ka o sɛ ɔɔ  
 meat eat.NML FOC COMP 3<sup>rd</sup>.SG roast eat  
 'It is eating meat that he roasted and did (as opposed to e.g. throwing away something else).'
- d. nɛne se-ɔɔo la ka o sɛ ɔɔ  
 meat roast-eat.NML FOC COMP 3<sup>rd</sup>.SG roast eat  
 'It is roasting meat and eating it that he did (as opposed to doing something else).'

Multi-verb constructions without object sharing, such as constructions in which  $V_1$  is an intransitive verb, do not allow the object to be pied-piped along with  $V_1$ , exemplified below (Hiraiwa and Bodomo 2008:806).

- (7) a. n da wa di la kapala  
 1<sup>st</sup>.SG PST come eat FOC fufu  
 'I came and ate fufu.'
- b. \*kapala waaɔ la ka n da wa  
 fufu come.Nml FOC COMP 1<sup>st</sup>.SG PST come  
 di  
 eat  
 'It is coming fufu that I did and ate fufu.'

The fact, then, that the object can be pied-piped with either  $V_1$  or  $V_2$  in (6) indicates  $V_{1,2} + \text{Obj}$  constituency.

Also occasionally cited as a defining feature of SVCs is the lack of an overt pronoun following  $V_2$ . Provided that the overt pronoun after  $V_2$  is coreferential with the object of  $V_1$ , object sharing seems to be excluded. Accordingly, Baker (1989) observes that a coordinate structure requires this pronoun whereas SVCs do not. Hiraiwa and Bodomo (2008:800) present data showing that the grammaticality of SVCs in Dàgáàrè is indeed dependent on the lack of an overt object after  $V_2$ .

- (8) o da sɛ la singkaa ɔɔ (\*a).  
 3<sup>rd</sup>.SG PST roast FOC groundnut.PL eat them  
 'He roasted groundnuts and ate them.'

Hiraiwa and Bodomo as well as Baker use these observations to argue in favor of an object sharing analysis of SVCs. Collins (1997), on the other hand posits that SVCs in Ewe do allow an overt pronoun after  $V_2$ . Aboh similarly cites an example of serialization from Akan in which an overt pronoun appears after  $V_2$  (Aboh 2009:8).

- (9) Kofi bɔ-ɔ Ama ku-u no  
 K strike-PST A kill-PST 3SG  
 'Kofi hit Ama and killed her.'

This particular property, then, is not a necessary condition for SVC-hood.

Additional less definitive diagnostic tests are found in the literature, including the presence of tense/aspect/polarity marking on only one of the verbs in an SVC. Baker (1989) and Collins (1997) argue that in SVCs,  $V_1$  is singly marked for tense/aspect and negation, whereas coordinate constructions involve a distinct marking on each verb. If this single tense/aspect/polarity-marker test was defining of SVCs, Twi multi-verb constructions would be excluded due to the obligatory tense/aspect and negation marking on all predicates (explained further in Section 3). Nevertheless, multi-verb constructions requiring the marking of both  $V_1$  and  $V_2$  for these features have occasionally been considered SVCs (e.g. Bradshaw 1993 for Numbami; Osam 2003 for Twi). Because these constructions still display many features in common with serializing constructions, it seems unnecessary to discount them as SVCs due to their additional tense/aspect/polarity marking. Thus, the single tense/aspect/polarity-marker criterion is somewhat tenuous.

Stewart (2001) uses adverbial modification as an additional diagnostic to differentiate between the event structures of multi-verb constructions. In a coordinate structure, the event denoted by each verb can be individually modified, but in a serializing structure, both sub-events cannot be individually modified. This type of adverbial modification is not regularly used as a diagnostic test for SVCs, but it is somewhat relevant to this thesis because adverbial modification shows that it is possible to individually modify events denoted by each verb in Twi multi-verb constructions, differentiating their event structure from the event structure proposed by Stewart (2001).

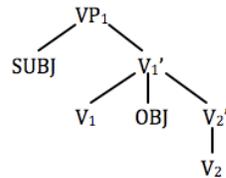
Though some of the observations outlined in this section may not be capable of definitively differentiating a serializing construction from a coordinate construction, they nevertheless provide a framework with which to investigate multi-verb constructions in Twi.



subjects and null objects that would normally not be dropped in Baule, Larson posits the Coupling Mechanism. Under the Coupling Mechanism, null objects recover content based on a unique definite description derived from the  $V_1$ -conjunct; the Coupling Mechanism succeeds only in cases where there is one unique possible referent for the null pronoun (Larson 2010:218). Due to the Coupling Mechanism's licensing of null pronouns, ESCs are seen to be simply cases of parataxis plus pro-drop, not true SVCs.

As for structures that are shown not to be covert coordination, the issue of the missing  $V_2$  object is treated in several ways. Baker (1989) suggests a double-headed VP structure with ternary branching in which the object is shared by both  $V_1$  and  $V_2$ :

(11) Baker (1989)



Similarly, Hiraiwa and Bodomo (2008) argue for parallel merge of  $V_1$  and  $V_2$  with the object, another interpretation of syntactic object sharing. Their theory involves a double-headed AspP rather than a structure of ternary branching and thus differs from Baker's in that  $V_1$  and  $V_2$  are not directly merged. The double-headed AspP is represented below:

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'Ozo pushed (a) few trees down.'

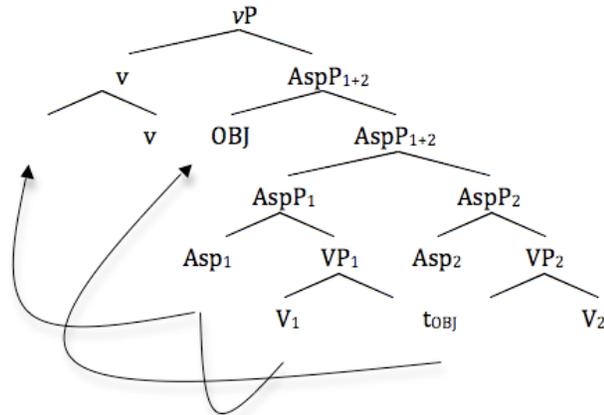
In (i), the only available interpretation is that all of the books were read, representative of a maximality effect, whereas in (ii), not all the trees pushed necessarily fell, so no maximality effect is present. If the maximality effect is present, as in (i), an E-type reading is assigned to unexpressed arguments and a null pronoun is assumed. If no maximality effect is present, it is inferred that no null pronoun exists. This E-type reading test can be applied to both  $V_2$  subjects and objects as Larson (2010:211) demonstrates:

(iii) Talua nsan cε be tra-li wuo di-li  
 girl three only 3PS catch-COMPL snake eat-COMPL  
 'Only three girls caught a snake and they ate it,' such that three girls caught snakes and three girls also ate snakes.

(iv) ɔ to-li oflε nyon cε di-li  
 3SS buy-COMPL papaya two only eat-COMPL  
 'S/he bought only two papayas and ate them,' such that both papayas were eaten.

Both (iii) and (iv) demonstrate a maximality effect, so Larson (2010) concludes that null pronouns are present in Baule multi-verb constructions such as these, supporting her claim of pro-drop.

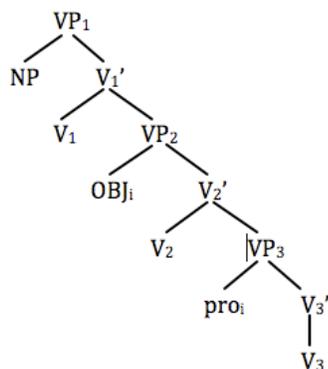
(12) Hiraiwa and Bodomo (2008:822)



The structure undergoes V-to-v movement and the shared object undergoes short-object shift as represented above. Crucially, these movements allow the otherwise symmetric sharing structure to be linearized and explain why the object appears in a position sandwiched between  $V_1$  and  $V_2$  rather than in the equally likely  $V_1$ - $V_2$ -OBJ sequence (Hiraiwa and Bodomo 2008:824). Hiraiwa and Bodomo's (2008) theory is motivated by the grammar of Dàgáárè, a language which allows three varieties of predicate clefting with object pied-piping:  $V_1$ +OBJ;  $V_2$ +OBJ; and  $V_1$ + $V_2$ +OBJ. Dàgáárè predicate cleft patterns suggest that in SVCs, both  $V_1$  and  $V_2$  form a syntactic constituent with the object. Baker's (1989) approach also predicts the availability of object pied-piping with  $V_1$ + $V_2$ , but it does not explicitly account for  $V_1$ +OBJ and  $V_2$ +OBJ cleft patterns in Dàgáárè because these strings are not constituents in the analysis. Regardless, both approaches treat SVCs as true instances of syntactic object sharing. Still, Hiraiwa and Bodomo (2008) point out that object pied-piping with  $V_2$  is not well attested in other languages and that a parametric investigation of object sharing in SVCs could show that UG provides more than one structure for object sharing. It is thus important to consider a variety of analyses motivated by other languages.

I now move on to discuss theories that do not rely on syntactic object sharing. Collins (1997) proposes a VP-shell analysis with the 'missing' object accounted for by an empty category *pro*.

(13) Collins (1997)



Drawing on data from Ewe, Collins demonstrates the existence of this empty category on the basis of the behavior of a postposition *yi* that assigns Case to an NP that has not been assigned Case. This postposition cannot appear when a construction lacks an NP to assign case to, as demonstrated below (Collins 1997:469)

- (14) Kofi fo Yao (\*yi).  
 K hit Y P  
 'Kofi hit Yao.'

Thus, the presence of *yi* after  $V_2$  in an SVC indicates the presence of an empty category, Collins argues, as demonstrated below (1997:470).

- (15) Me nya q̄evi-ε dzo (yi). [= dzo(-e)]  
 I chase child-DEF leave P  
 'I chased the child away.'

Aboh (2009:8), however, points out several difficulties that a VP-shell analysis encounters, including the appearance of a tense/aspect marker on both verbs in an SVC as well as the ability of a manner adverb to appear between the object and  $V_2$ . Both of these issues are relevant to the current analysis of Twi, as tense/aspect marking on each verb in a multi-verb construction is required and Twi allows manner and temporal adverbs to follow either  $V_1 + \text{Obj}$  or  $V_2 (+\text{Obj})$ . Aboh's resolution of these issues involves positing a functional projection of  $V_2$ , such as AspP, in order to account for these items.

Aboh's (2009) analysis differs considerably from other analyses in other ways as well. First of all, Aboh does not invoke true syntactic object sharing and as such departs from the generative tradition (e.g. Baker 1989; Collins 1997) which states the sharing of an internal argument as a necessary condition in SVCs. Instead, Aboh first compares SVCs to Object Verb Constructions (OVCs). An OVC from Gungbe is exemplified below:

- (16) Asiba jε lɛsi ɖu ji (Aboh 2009:9)  
 A reach rice eat PRT  
 'Asiba started eating rice.'

Aboh's analysis states that  $V_1$  in OVCs does not assign Case and the object must thus merge to a position to the right of  $V_2$  to receive case. Thereafter, the object moves to Spec, Asp to check the EPP feature of Asp, resulting in a  $V_1\text{-OBJ-}V_2$  surface order. Due to similarities between OVCs and SVCs in Gungbe, such as requiring a single tense/negation marker, allowing *wh*-extraction, and allowing a prospective aspectual marker to intervene between the object and  $V_2$ , SVCs are treated as instances of OVCs and their structure is similarly derived. An SVC is thus composed of a functional  $V_1$  and a lexical  $V_2$ , with the subject and object fulfilling thematic roles of  $V_2$ . This analysis seems especially applicable to 'take-type' multi-verb constructions, which Aboh (2009) discusses via this analysis, and which we see in Twi:

- (17) Kofi di aburo no kɔɔ dɔaso  
 K take corn DET go-PST market  
 'Kofi brought the corn to the market.'

However, based on the fact that *di* 'take' cannot appear alone in a sentence—unlike other verbs in the Twi multi-verb constructions I discuss here—I do not discuss this type of

construction and its relationship to the structural analysis I propose in Section 4. My empirical analysis focuses mainly on verbs that appear to be fully lexical. Aboh (2009:27) also addresses constructions that appear to contain two lexical verbs:

- (18) Migan *ɔa*                      kponɔn                      lɛ                      yi                      ahwan  
 M                      prepare                      soldier                      PL                      go                      war  
 ‘Migan prepared the soldiers go to war (i.e. by making some magic).’

He concludes that, although in many situations a verb such as *ɔa* ‘prepare’ has a fully lexical meaning, when used as part of a series, such a verb obligatorily takes on a functional meaning. Thus, in (18), *V*<sub>1</sub>, *ɔa*, acts as a “hidden causative” rather than a lexical verb and the theory of internal argument-sharing is again rejected.

All of the analyses of serializing structures discussed thus far assume a unified analysis of SVCs. Stewart (2001), however, proposes that two different types of SVCs exist, each with a unique structure. These two structures are the transitive+transitive structure in which two events occur consecutively, dubbed the “consequential SVC” (CSVC) and a transitive+result structure in which the action denoted by *V*<sub>1</sub> brings about *V*<sub>2</sub>, referred to as a “resultative SVC” (RSVC). The following examples are from Èdó, Stewart’s empirical focus.

- (19) Ozo    le                      evbare re    CSVC (Stewart 2001:3)  
 O                      cook    food    eat  
 ‘Ozo cooked the food and ate it.’

- (20) Esoa    koko    Adesuwa                      mose    RSVC (Stewart 2001:3)  
 E                      raise    A    be-beautiful  
 ‘Esoa raised Adesuwa to be beautiful.’

Relying on the assumption that adverbs are predicated of an event denoted by the verb, Stewart argues that the distribution of adverbs can distinguish between the event structures of CSVCs and RSVCs. CSVCs allow for the insertion of an adverb between *V*<sub>1</sub> and *V*<sub>2</sub> and therefore contain a functional projection between the verbs. Thus, two event positions are available in the CSVC. One of these necessarily quantifies over both verbs such that an adverb in this position leads to an interpretation that both *V*<sub>1</sub> and *V*<sub>2</sub> are modified. A separate event position governs one verb alone. RSVCs, on the other hand, which do not allow for the insertion of an adverb between *V*<sub>1</sub> and *V*<sub>2</sub>, contain only one event position that quantifies over both verbs and do not contain a functional projection between the verbs.

Stewart (2001) also discusses the structural implication of the differences between CSVCs and RSVCs through the distribution of the adverbial particle *tobore*, ‘himself/herself/itself’. According to Stewart, *tobore* adjoins to the right of an NP and can be co-referent with an empty category.

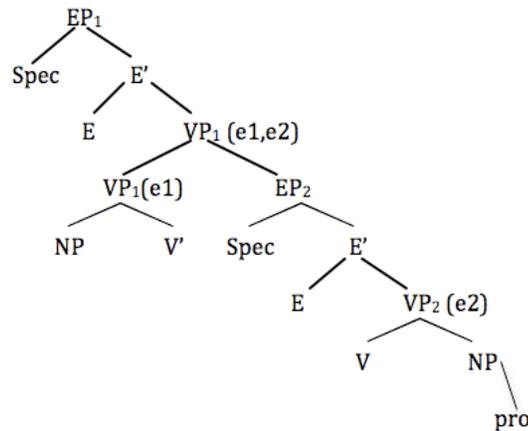
- (21) Ogo<sub>k</sub>    de                      t<sub>k</sub>                      tobore<sub>k</sub>    (Stewart 2001:51)  
 bottle    fall    itself  
 ‘The bottle fell by itself.’

The behavior of *tobore* in the CSVC and RSVC differs as exemplified as follows (Stewart 2001:53):

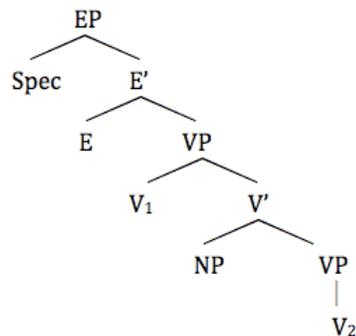
- (22) Ozo de iyan<sub>k</sub> dunmwun pro tobore<sub>k</sub> (CSVC)  
 O buy yam pound pro itself  
 'Ozo bought the yam and pounded it (itself)'
- (23) \*Ozo koko Adesuwa<sub>k</sub> mose tobore<sub>k</sub> (RSVC)  
 O raise A be-beautiful herself  
 'Ozo raised Adesuwa to be beautiful (herself).'

The grammaticality of (22) indicates the presence of an empty category to which *tobore* adjoins, whereas the ungrammaticality of (23) indicates that an empty category is not present. Stewart thus concludes that CSVCs are represented by an adjunction structure with object sharing mediated by the null category *pro*. RSVCs, on the other hand, are characterized by true syntactic object sharing; the object NP is assigned the internal theta roles of both  $V_1$  and  $V_2$ . Their structures are represented in the modified Stewart trees below (Stewart 2001:38 and 28):

- (24) CSVC



- (25) RSVC



In summary, this section has provided a brief introduction to the relevant and recent literature on multi-verb constructions. The first major issue presented was differentiation from coordinate structures. It is argued that some multi-verb constructions that closely resemble serializing structures are, in fact, cases of covert coordination (Larson 2010). Secondly, I discussed the issue of object sharing and provided accounts that argue for true syntactic object sharing (Baker 1989, Hiraiwa and Bodomo 2008) as well as

accounts that reject true syntactic object sharing (Collins 1997, Aboh 2009). Finally, I gave a summary of Stewart's (2001) theory that a variety of types of SVCs exist, differing in event structure and object sharing. These structural accounts will be relevant as I turn to my own data from Twi, but first, I address existing characterizations of multi-verb constructions in Akan from the literature.

### 2.3 Multi-Verb Constructions in Akan

Though multi-verb constructions in many West African languages have played a large role in the study of serialization, Akan is only occasionally mentioned in cross-linguistic or typological studies. Even so, there is a small body of authors who have recently discussed multi-verb constructions in Akan (Abrefa 2009, Agyeman 2003, Hellan et al. 2003, Osam 2003)<sup>6</sup> and their characterizations are fairly uniform. As a general definition, an SVC in Akan is taken to be a construction containing two or more verbs or verb phrases with no conjunctions (Agyeman 2003). Additionally, a great deal of importance is placed on the level of semantic integration between the verbs. According to Osam (1994:193), a process of "cognitization" turns what are two separate events to begin with into a single event in an SVC. Others agree with single-eventhood as a defining feature of SVCs in Akan (Abrefa 2009), but some accounts alternatively argue for closely related, but still separate events in certain types of SVCs (Hellan et al. 2003, Agyeman 2003). Nevertheless, for these authors, it is this semantic integration that not only differentiates these multi-verb constructions from coordinate constructions with multiple clauses, but also differentiates between different types of SVCs in Akan.

Two types of SVCs are often postulated—clause chaining SVCs (26a) and integrated SVCs (ISVCs). ISVCs are further divided into two types—idiomatic ISVCs (26b) and semantically compositional ISVCs (26c).

- (26) a. Clause Chaining (Agyeman 2003:5)  
 Ama tu-u                    bayerε noa-e                    di-i  
 A    uproot-PST    yam    cook-PST                    eat-PST  
 'Ama uprooted the yam, cooked it (and) ate it.'
- b. Integrated – Idiomatic (Agyeman 2003:4)  
 Ama gye                    asεm    no                    di  
 A    collect                    story    DET                    eat  
 'Ama believes the story.'
- c. Integrated – Semantically Compositional (Abrefa 2009:63)  
 ɔ-bɔ-ɔ                    mpaε ma-a                    me  
 3<sup>rd</sup>.SG-say-PST                    prayer give-PST                    me  
 'S/he prayed for me.'

Regardless of whether a particular author characterizes all Akan SVCs as representing a single event, ISVCs are always said to contain verbs that are more semantically integrated than those in clause chaining SVCs. An attempt to separate each SVC into two separate sentences is often used to represent the difference between the extent to which clause chaining SVCs and ISVCs are semantically integrated:

<sup>6</sup> This is not meant as an exhaustive list, but a representative sample.

- (27) a. Ama tu-u bayerε (Agyeman 2003:5)  
 A uproot-PST yam  
 'Ama uprooted the yam.'
- b. Ama noa-e bayerε  
 A cook-PST yam  
 'Ama cooked the yam.'
- c. Ama di-i bayerε  
 A eat-PST yam  
 'Ama ate the yam.'
- (28) a. \*Ama gye asεm no (Agyeman 2003:5)  
 A collect story DET  
 'Ama collects the story.'
- b. \*Ama di asεm no  
 A eat story DET  
 'Ama eats the story.'
- (29) a. ɔ-bɔ-ɔ mpaεε (Abrefa 2009:63)  
 3SG-say-PST prayer  
 'S/he prayed.'
- b. \*ɔ-ma-a me  
 3SG-give-PST me  
 'S/he gave me.'

The ungrammaticality of the ISVC ((28) and (29)) separated into component sentences when compared to the acceptable separation of the clause chaining SVC (27) is cited as evidence of more semantic integration in ISVCs (Agyeman 2003, Abrefa 2009, Osam 2003).

While this test may highlight differences between the constructions, it does not necessarily prove that the verbs are more semantically integrated. It is expected that a multi-verb construction with an idiomatic interpretation such as (26b) would result in ungrammaticality or at least a different meaning when separated into component sentences, thus it is the holistic/idiomatic interpretation of this construction that distinguishes it from other multi-verb constructions. In (26c) it is the fact that the verb *ma* 'give' requires additional arguments—i.e. the thing that is given—in order to be grammatical that makes (29b) problematic, not its semantic integration with *bɔ*, 'say'. The difference in semantic integration, then, while perhaps intuitively discerned by speakers, is less indicative of different types of SVCs than a structural account would be.

Discussion of structural differentiation between clause chaining SVCs and ISVCs in the literature is limited to differences in referent/argument sharing. Referent sharing occurs when the verb in question has a syntactic subject or object co-referent with the subject or object of another verb, which may be overt or null. Argument sharing implies true syntactic sharing of an item (i.e. only one argument exists and it bears the theta-roles of multiple verbs). The existence of an overt pronoun as an argument of  $V_2$  is an indicator of referent sharing as is the grammaticality of the insertion of a resumptive pronoun. Thus, because resumptive subject pronouns are "generally ruled out" for  $V_2$ , true argument

sharing as opposed to referent sharing is said to exist in Akan SVC subjects (Hellan et al. 2003:2).

ISVCs also exhibit argument sharing in the form of object sharing (Agyeman 2003, Hellan et al. 2003). Agyeman (2003:6) suggests that argument sharing exists because it is ungrammatical for ISVCs in Akan to have more than one object NP, “irrespective of the animate status of the object,” but he provides no example to confirm this. Hellan et al.’s (2003:12) evidence of object sharing is demonstrated through the following example.

- (30)   ɔ-de                   no                                   fɛm-m                   me  
          3<sup>rd</sup>.SG-take       3<sup>rd</sup>.SG (animate)       lend-PST               1<sup>st</sup>.SG  
          ‘He lent me it (a horse).’

Though  $V_2$  is ditransitive and should thus take two objects, only one is present. Due to the ‘overtness condition on animate pronouns,’ the presence of a covert second object is ruled out which implies that the second object of  $V_2$  is syntactically shared with  $V_1$  (Hellan et al. 2003:12).

Clause chaining SVCs, on the other hand, are said to exhibit referent sharing; the objects of both verbs simply refer to the same entity. Referent sharing thus categorizes a construction with a null pronoun or an overt pronoun after  $V_2$ . Due to the fact that a non-animate pronoun in object position takes a null form in Akan, a 3<sup>rd</sup> singular pronoun will be covert when the object is inanimate, but overt when the object is animate (Agyeman 2003, Osam 1997, Hellan et al. 2003). These two situations are exemplified below:

- (31)   Ama   frɛ-ɛ                   Kofi   soma-a                   no                   (Agyeman 2003:6)  
          A     call-PST               K     send-PST               3<sup>rd</sup>.SG  
          ‘Ama called Kofi (and) sent him.’

- (32)   Ama   tu-u                   bayerɛ   noa-e                   di-i                   (Agyeman 2003:7)  
          A     uproot-PST       yam   cook-PST               eat-PST  
          ‘Ama uprooted yam, cooked it (and) ate it.’

Referent sharing is exhibited in both (31) and (32), but the object of  $V_2$  is overt in (31) because it refers to the animate Kofi, while the objects of  $V_2$  and  $V_3$  are null in (32) because they are inanimate. As a result of this characterization, SVCs in which the objects of  $V_2$  are null are not distinguished from those in which the object of  $V_2$  is overt, which differs greatly from other literature on SVCs (e.g. Stewart 2001). In fact, Larson (2010) argues that the distribution of null vs. overt object pronouns in Baule, a distribution similar to that observed in Twi, is evidence that multi-verb constructions in Baule are in fact not SVCs. As we will see, however, the presence of an overt pronoun after  $V_2$  in Twi does not necessarily differentiate constructions structurally. This behavior does differ from other accounts of multi-verb constructions and is explained in Section 4.

A problematic aspect of most analyses of multi-verb constructions in Akan is that they do not provide systematic differentiation between coordinate structures and non-coordinate structures. Specifically, there is almost no acknowledgement of covert coordination as a possible construction/analysis. Instead, structures similar to examples of covert coordination in other languages are characterized as SVCs (cf. (31)). Hellan et al. (2003) do rule out the possibility of covert coordination in one example via a *wh* movement extraction test, but this test is not systematically applied to other examples or types of SVCs. As such, I question the completeness of these analyses, prompting the differentiation

between coordinate and non-coordinate constructions to take a prominent role in my analysis.

To conclude this section, I highlight the fact that many different analyses of multi-verb constructions exist, providing several frameworks with which to characterize multi-verb constructions in Twi. Existing literature on multi-verb constructions in Akan is unified, but lacking in one key issue: the differentiation between coordinate and non-coordinate structures. With these considerations in mind, I turn now to the data.

### 3: The Data: Multi-Verb Constructions in Twi

This section first introduces examples of the types of Twi multi-verb constructions this thesis discusses. Following these examples is an account of the constraints on these structures in relation to overt/null pronouns, extraction, tense/aspect/polarity, and adverbial modification. Indeed, the behavior of all four of these elements contributes to the understanding of the structure of multi-verb constructions in Twi. The fact that a pronoun's overtness is determined by animacy and is unaffected by the use of an overt coordinator shows that the presence of a null or overt object pronoun after  $V_2$  does not necessarily indicate structural differences. Extraction facts indicate an asymmetry within the clause that provides evidence against a coordinate structure in some types of multi-verb constructions. The required marking on  $V_2$  that varies depending on tense/aspect suggests a structure in which both verbs have highly articulated extended projections which is uncommon in the SVC literature. The fact that a construction in the negative requires a negation marker on  $V_2$  gives further evidence for this highly articulated projection. Finally, patterns and scope of adverbial modification motivate a structure in which each vP can be individually modified. The patterns observed differentiate between coordinating and non-coordinating multi-verb constructions and eventually motivate an analysis of serialization, despite the highly articulated extended projection of consecutive verbs. As such, evidence from this empirically focused section lays the foundation for the structure I propose in Section 4.

First consider the examples of multi-verb constructions in Twi below, as defined by having two (or more) verbs ( $V_1$  and  $V_2$ ) without an overt coordinator. In all of (33) – (35),  $V_2$  does not overtly realize its subject, but the realization of its object differs between the three.

- (33) a. Ama wɔɔ bayerɛ no dii aburo (no)  
 A pound-PST yam DET eat-PST corn (DET)  
 'Ama pounded the yam and ate the corn.'
- b. Ama bɔɔ Kofi tuu ɛboɔ  
 A kick-PST K throw-PST rock  
 'Ama kicked Kofi and threw a rock.'
- c. Kofi tɔn kraman no tɔɔ  
 K sell-PST dog DET buy-PST  
 akokɔ  
 chicken  
 'Kofi sold the dog and bought a chicken.'

In (33 a – c) the objects of  $V_1$  and  $V_2$  differ; examples of this type thus do not exhibit object sharing and both objects are overtly realized. Next consider examples in which the objects of  $V_1$  and  $V_2$  do not differ.

- (34) a. Kofi kyii akɔla no bɔɔ no  
 K catch-PST child DET beat-PST 3<sup>rd</sup>.SG  
 ‘Kofi caught the child and beat it.’
- b. akɔla no bɔɔ kania no sɛii no  
 child DET hit-PST light DET ruin 3<sup>rd</sup>.SG  
 ‘The child hit the light and broke it.’
- c. Ama tɔɔ kraman no titii  
 A buy-PST dog DET raise-PST  
 no/yɛ  
 3<sup>rd</sup>.SG/do  
 ‘Ama bought the dog and raised it.’

(34) differs from (33) in that the object of  $V_2$  is co-referent with the object of  $V_1$ . Note that the object of  $V_2$  is obligatorily marked as a pronoun in (34 a and b) and optionally marked as a pronoun in (34c). Finally, consider constructions in which no co-referential pronoun appears after consecutive verbs.

- (35) a. Ama wɔɔ bayerɛ no dii yɛ  
 A pound-PST yam DET eat-PST do  
 ‘Ama pounded the yam and ate it.’
- b. Ama nuaa bayerɛ no wɔɔ yɛ  
 A boil-PST yam DET pound-PST do  
 dii yɛ  
 eat-PST do  
 ‘Ama boiled the yam, pounded it, and ate it.’
- c. Ama hwiee nsuo no nomm yɛ  
 A pour-PST water DET drink-PST do  
 ‘Ama poured the water and drank it.’
- d. Kofi kumm aboa no dii yɛ  
 K kill-PST animal DET eat-PST do  
 ‘Kofi killed the animal and ate it.’
- e. Ama tɔɔ akokɔ no dii yɛ  
 A buy-PST chicken DET eat-PST do  
 ‘Ama bought the chicken and ate it.’

In (35 a – e) the objects of  $V_1$  and  $V_2$  (and  $V_3$  in the case of (35b)) do not differ and they have no overt realization. The rest of Section 3 provides evidence that the constructions illustrated in (33) are instances of covert coordination, whereas those in (34) and (35) are non-coordinating. Though (34) and (35) differ in the realization of an overt pronoun after  $V_2$ , we will see that this does not prevent a unified structural account for the two types, nor does it hinder an ‘object sharing’ analysis of such constructions in Twi.

### 3.1 Pronominal Objects

Considering that the lack of an overt pronoun following consecutive verbs in a multi-verb construction is often cited as a defining feature of SVCs, it is relevant to discuss the realization of pronominal objects in Twi multi-verb constructions. As previously mentioned, inanimate 3<sup>rd</sup> person singular pronouns in object position are null in Twi.

- (36) a. Ama dii yε  
 A eat-PST do  
 'Ama ate it (the yam).'
- b. \*Ama dii no  
 A eat-PST 3<sup>rd</sup>.SG  
 'Ama ate it (the yam).'
- (37) a. Ama titii no  
 A raise-PST 3<sup>rd</sup>.SG  
 'Ama raised it (the child).'
- b. \*Ama titii yε  
 A raise-PST do  
 'Ama raised it (the child).'

Furthermore, there are specific verbs in Twi that require an overt 3<sup>rd</sup> person singular object, even when their objects are inanimate.

- (38) Akɔla no sɛi no  
 child DET break-PST 3<sup>rd</sup>.SG  
 'The child broke it (the lamp).'

The verb *sɛi* 'to break or ruin' requires an overt pronoun because the lack of an overt pronoun leads to an alternate unaccusative interpretation.

- (39) Akɔla no sɛi yε  
 child DET break-PST do  
 'The child broke.'

It can be concluded, then, that in mono-clausal structures, 3<sup>rd</sup> person singular inanimate object pronouns are phonetically null, whereas 3<sup>rd</sup> person singular animate object pronouns as well as object pronouns following particular types of verbs (such as *sɛi*) must be overtly realized.

Having explained these restrictions, we now turn to pronominal realization in multi-verb constructions. Baker (1989) observes that in Yoruba, consecutive verbs in a serializing structure do not have overt pronominal objects, whereas consecutive verbs in a corresponding coordinate structure do.

- (40) a. Bola se eran ta (Baker 1989:529)  
 B cook meat sell  
 'Bola cooked some meat and sold it.'

- b. Bola se eran, o si ta a  
 B cook meat he and sell it  
 'Bola cooked some meat and (then) he sold it.'

If this were also the case for Twi, we would expect two things: first, that coordinate and non-coordinate structures would display differences in pronominal realization; and two, that structures with an overt pronoun after  $V_2$  could be ruled out as serializing. In Twi, however, multi-verb constructions without overt coordinators as well as overtly coordinated structures show the same restrictions on pronominal realization that monoclausal structures show. Examples (34a) and (35a), repeated below, show this to be true for structures without overt coordinators.

- (41) Kofi kyii akɔla no bɔɔ no  
 K catch-PST child DET beat-PST 3<sup>rd</sup>.SG  
 'Kofi caught the child and beat it.'
- (42) Ama wɔɔ bayerɛ no dii yɛ  
 A pound-PST yam DET eat-PST do  
 'Ama pounded the yam and ate it.'

(41) refers to a child, an animate entity, which explains the presence of *no*, whereas (42) refers to a yam, an inanimate entity, which explains the lack of an overt pronoun. Similarly, (43) and (44) show that animacy predicts whether a 3<sup>rd</sup> person singular object pronoun is realized as null or overt in a case of overt coordination.

- (43) Ama wɔɔ bayerɛ no ɛna ɔ-dii yɛ  
 A pound-PST yam DET COORD 3<sup>rd</sup>.SG-eat-PST do  
 'Ama pounded the yam and she ate it.'
- (44) Kofi kyii akɔla no ɛna ɔ-bɔɔ no  
 K catch-PST child DET COORD 3<sup>rd</sup>.SG-pound-PST 3<sup>rd</sup>.SG  
 'Kofi caught the child and he beat it.'

Because animacy, rather than differences in clausal structure (e.g. coordinate vs. serializing), seems to predict the presence/absence of overt pronouns in object position, these pronoun facts do not provide evidence to structurally differentiate between coordinate and non-coordinate structures in Twi. Pronominal realization and its relationship to the structure of multi-verb constructions will be further discussed in Section 4, but I now turn to extraction as a method of differentiating between coordinate and non-coordinate constructions.

### 3.2 Extraction

Twi allows *wh* and focus movement of objects.

- (45) a. Ama wɔɔ bayerɛ no  
 A pound-PST yam DET  
 'Ama pounded the yam.'

- b. diɛn na Ama wɔɔ yɛ?  
 what FOC A pound-PST do  
 'What did Ama pound?'
- (46) a. Ama dii bayerɛ no  
 A eat-PST yam DET  
 'Ama ate the yam.'
- b. bayerɛ no na Ama dii yɛ  
 yam DET FOC A eat-PST do  
 'It was the YAM that Ama ate.'

Twi also allows predicate cleft, a form of extraction that involves focusing an uninflected verb root to a left peripheral position, leaving behind an inflected copy of the verb. At least two types of predicate cleft constructions exist in Twi—those that have focus interpretations and those that have emphatic interpretations. For the purposes of this thesis, I focus on the focus interpretation, which is represented below<sup>7</sup>.

- (47) wɔ na Ama wɔɔ bayerɛ no  
 pound FOC A pound-PST yam DET  
 'It was pounding that Ama did to the yam.'
- (48) di na Ama dii bayerɛ no  
 eat FOC A eat-PST yam DET  
 'It was eating that Ama did to the yam.'

In their discussion of Dàgáárè, Hiraiwa and Bodomo (2008) differentiate between two types of predicate cleft constructions—those in which the left peripheral item bears nominal morphology (e.g. Èdó, Stewart 2001; Nupe, Kandybowicz 2008) and those in which the left peripheral predicate is uninflected (e.g. Fongbe and Haitian Creole). Twi falls into the latter category.

I now discuss extraction in relation to multi-verb constructions, as these facts can be used to probe structure. Consider first example (33a) in which the objects of  $V_1$  and  $V_2$  differ and are thus both overtly realized. Both NP extraction and predicate clefting are disallowed, suggesting in this case that the multi-verb construction is an island.

<sup>7</sup> Predicate cleft constructions with an emphatic interpretation are similar to those with a factive interpretation, however, the focus marker *na* is replaced with *a*, a functional item I have not spent time investigating (it is thus glossed as 'a' below).

- (v) wɔ a Ama wɔɔ bayerɛ no  
 pound a A pound-PST yam DET  
 'Ama REALLY pounded the yam.'

The extraction patterns of both types of predicate cleft constructions are identical, so the emphatic type will not be further discussed.

(49) \*WH MOVEMENT OF V<sub>1</sub> OBJECT

- a. \*deɛn na Ama wɔɔ yɛ dii aburo  
 what FOC A pound-PST do eat-PST corn  
 no?  
 DET  
 'What did Ama pound and eat the corn?'

\*FOCUS MOVEMENT OF V<sub>2</sub> OBJECT

- b. \*aburo no na Ama wɔɔ bayerɛ  
 corn DET FOC A pound-PST yam  
 no dii yɛ  
 DET eat-PST do  
 'It was the corn that Ama pounded the yam and ate.'

\*PREDICATE CLEFTING OF V<sub>1</sub>

- c. \*wɔ na Ama wɔɔ bayerɛ no dii  
 pound FOC A pound-PST yam DET eat-PST  
 aburo no  
 corn DET  
 'It was pounding that Ama did to the yam and ate the corn.'

\*PREDICATE CLEFTING OF V<sub>2</sub>

- d. \*di na Ama wɔɔ bayerɛ no dii  
 eat FOC A pound-PST yam DET eat-PST  
 aburo no  
 corn DET  
 'It was eating that Ama pounded the yam and did.'

Extraction of the object of V<sub>1</sub> or V<sub>2</sub> is not permissible, nor is predicate clefting of either V<sub>1</sub> or V<sub>2</sub>, thus the constructions in (49) can be seen as instances of covert coordination. Having established that this type of multi-verb construction is simply covert coordination, I focus on constructions like (34a) and (35a) for the remainder of this section.

The following examples show that *wh* and focus extraction are permitted in (34a) and (35a).

- (50) deɛn na Ama wɔɔ yɛ dii yɛ?  
 What FOC A pound-PST do eat-PST do  
 'What did Ama pound and eat?'

- (51) akɔla no na Kofi kyii no bɔɔ  
 child DET FOC K catch-PST 3<sup>rd</sup>.SG beat-PST  
 no  
 3<sup>rd</sup>.SG  
 'It was the child the Kofi caught and beat.'

However, this fact is not structurally revealing; the object of V<sub>2</sub> is co-referent with the object of V<sub>1</sub> so the exemplified extraction facts could be characterized as ATB extractions. This thesis only explores multi-verb constructions in which the objects of V<sub>1</sub> and V<sub>2</sub> are co-referent, thus this type of extraction is not helpful in determining clausal structure.

Predicate clefting, however, reveals patterns that are structurally revealing. Consider first the permissibility of  $V_1$  clefting in (34a) and (35a).

- (52) wɔ na Ama wɔɔ bayerɛ no dii yɛ  
 pound FOC A pound-PST yam DET eat-PST do  
 'It was pounding that Ama did to the yam and ate it.'
- (53) kyi na Kofi kyii akɔla no bɔɔ no  
 catch FOC K catch-PST child DET beat-PST 3<sup>rd</sup>.SG  
 'It was catching that Kofi did to the child and beat it.'

The permissibility of clefting  $V_1$  is evidence against a (covert) coordinate structure because coordinate island constraints would otherwise prevent clefting of  $V_1$ . Clefting of  $V_2$  is not permissible, however, revealing an asymmetry in the clausal structure.

- (54) \*di na Ama wɔɔ bayerɛ no dii yɛ  
 eat FOC A pound-PST yam DET eat-PST do  
 'It was eating that Ama pounded the yam and did.'
- (55) \*bɔ no Kofi kyii akɔla no bɔɔ no  
 beat FOC K catch-PST child DET beat-PST 3<sup>rd</sup>.SG  
 'It was beating that Kofi caught the child and did.'

These extraction facts suggest that the above examples are not instances of coordination<sup>8</sup>. Furthermore, by appealing to Minimality/Shortest Move considerations, the grammaticality

<sup>8</sup> The reported extraction facts are robust. Indeed, other examples of similar constructions show that extraction of  $V_1$  is permissible whereas extraction of  $V_2$  is not.

- (vi) a. bɔ na Akɔla no bɔɔ kania no sɛii no  
 hit FOC child DET hit-PST light DET break 3<sup>rd</sup>.SG  
 'It was hitting that the child did to the light and broke it.'
- b. \*sɛi na Akɔla no bɔɔ kania no sɛii no  
 break FOC child DET hit-PST light DET ruin 3<sup>rd</sup>.SG
- (vii) a. tɔ na Ama tɔɔ kraman no titii  
 buy FOC A buy-PST dog DET raise-PST  
 no/yɛ  
 3<sup>rd</sup>.SG/do  
 'It was buying that Ama did to the dog and raised it.'
- b. \*titi na Ama tɔɔ kraman no titii  
 raise FOC A buy-PST dog DET raise-PST  
 no/yɛ  
 DET/do
- (viii) a. nua na Ama nuaa bayerɛ no wɔɔ  
 boil FOC A boil-PST yam DET pound-PST  
 yɛ dii yɛ  
 do eat-PST do  
 'It was boiling that Ama did to the yam, pounded it, and ate it.'

of  $V_1$  extraction and the ungrammaticality of  $V_2$  extraction can be explained by a structure in which  $V_1$  is hierarchically superior to  $V_2$ .

Aside from revealing an asymmetrical relationship between verbs, predicate cleft facts make several other important contributions to this thesis. First, recall that objects of  $V_2$  co-referent with objects of  $V_1$  are predictably present or absent based on animacy. Predicate clefting patterns in Twi are invariant, regardless of the overtness/animacy of this co-referent object. Second, these extraction facts have considerable implications in relation to the previous literature on Twi, which has only sparsely provided structural evidence in favor of differentiation between coordinate and non-coordinate multi-verb constructions (cf. Hellan et al. 2003 in relation to *wh* extraction in sentences like (35)). Indeed, predicate clefting in Twi multi-verb constructions has been seemingly neglected entirely; thus, the asymmetry that I identify here has not, to my knowledge, been previously discussed in relation to Twi. The differentiation between my characterization of Twi multi-verb constructions and characterizations provided by previous literature will be further discussed in Section 4. Immediately, however, I return to the descriptive characterization at hand by discussing tense, aspect, and polarity.

### 3.3 Tense/Aspect

Before presenting tense/aspect in relation to multi-verb constructions, I briefly discuss the tense/aspect system in Twi. Twi marks both tense and aspect (Dolphyne 1988; Osam 2003). There is some disagreement over the precise characterization of the tense/aspect system in Twi, but for the purposes of this thesis, I consider Twi tenses to distinguish between past, non-past, and non-finite. Though the characterization of the future marker is not agreed upon, at present I treat it simply as a manifestation of  $T_{\text{NON-PAST}}$ . Aspectual distinctions are: habitual, perfect, progressive, and immediate future.

There are two realizations of the  $T_{\text{PAST}}$  head. When aspect is present, this head surfaces as a High tone-bearing *na*.

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	b.	*wɔ pound yɛ do	na FOC	Ama A	nuaa boil-PST	bayerɛ yam	no DET	wɔɔ pound-PST
	c.	*di pound yɛ do	na FOC	Ama A	nuaa boil-PST	bayerɛ yam	no DET	wɔɔ pound-PST
(ix)	a.	hwie pour yɛ do	na FOC	Ama A	hwiee pour-PST	nsuo water	no DET	nomm drink-PST
								'It was pouring that Ama did to the water and drank it.'
	b.	*nom drink yɛ do	na FOC	Ama A	hwiee pour-PST	nsuo water	no DET	nomm drink-PST

- (56) na Ama a-wɔ bayerɛ no  
 PST A PERF-pound yam DET  
 'Ama had pounded the yam.'

When no overt head (e.g. aspect or negation) intervenes between T<sup>0</sup> and V<sup>0</sup>, the simple past surfaces as a lengthened verb nucleus.

- (57) Kofi dii aburo no  
 K eat-PST corn DET  
 'Kofi ate the corn.'

- (58) Kofi dii \*(yɛ)  
 K eat-PST do  
 'Kofi ate (it).'

Notice the appearance of *yɛ* when the construction lacks an object following the verb. Though others have traditionally treated this *yɛ* as an exponent of past or completive aspect (Dolphyne 1988; Osam 2003), recent work provides evidence that *yɛ* is a product of do-insertion conditioned by prosodic considerations (Kandybowicz 2010). Section 4 contains a more in-depth discussion of Kandybowicz's (2010) proposal and its implication for multi-verb constructions, but at present I treat *yɛ* as do-insertion and gloss it as such.

I now provide examples of non-past tense in Twi, beginning with the future, which is marked by the verbal prefix *bɛ-*.

- (59) Kofi bɛ-di  
 K FUT-eat  
 'Kofi will eat (it).'

Aside from the habitual aspect, which is marked by a High tone on the verb<sup>9</sup>, all other aspects discussed here are marked as verbal prefixes.

#### HABITUAL

- (60) Kofi dí bayerɛ  
 K eat yam  
 'Kofi eats yam.'

#### PROGRESSIVE

- (61) Kofi re-di  
 K PROG-eat  
 'Kofi is eating.'

#### PERFECT

- (62) Kofi a-di  
 K PRF-eat  
 'Kofi has eaten.'

<sup>9</sup> There are two manifestations of habitual aspect in Twi; the first is a phonetically null verbal prefix spelled out as a floating High tone (cf. 60) and the second is an overt prefix (Kandybowicz 2010). Only the former is discussed here.

## IMMEDIATE FUTURE

- (63) Kofi    *reβ-di*  
 K        IMD FUT-eat  
 'Kofi is about to eat.'

In some multi-verb constructions, what seems to be another form of tense/aspect marking appears on the non-initial verb—a low-tone *à*-prefix. This prefix is homophonous with the perfect aspectual marker, but can surface on non-initial verbs in any non-past construction aside from the habitual. Osam (2003) calls this prefix the “consecutive” aspect, but I find that it is more accurately characterized as an infinitival marker (Boadi 2008). Section 4 provides a more detailed discussion of this infinitival marker, but at present this marker will be glossed as INF. I now turn to the constraints on tense and aspect marking in Twi multi-verb constructions.

Consider first multi-verb constructions in the future tense.

- (64) a.    Kofi    *bε-kyi*        *akɔla*    *no*        *\*(a)-bɔ*        *no*  
           K        FUT-catch    child    DET    INF-beat        3<sup>rd</sup>.SG  
           'Kofi will catch the child and beat it.'
- b.    *\*Kofi*    *bε-kyi*        *akɔla*    *no*        *bε-bɔ*        *no*  
           K        FUT-catch    child    DET    FUT-beat        3<sup>rd</sup>.SG
- (65) a.    Ama    *bε-wɔ*        *bayerε*    *no*        *\*(a)-di*  
           A        FUT-pound    yam    DET    INF-eat  
           'Ama will pound the yam and eat it.'
- b.    *\*Ama*    *bε-wɔ*        *bayerε*    *no*        *bε-di*  
           A        FUT-pound    yam    DET    FUT-eat

The data show that in multi-verb constructions in the future, both  $V_1$  and  $V_2$  are obligatorily marked<sup>10</sup>. The marking on  $V_1$  is the future marker *bε*, but  $V_2$  may not take the future prefix.

<sup>10</sup> The reported future-marking facts are robust based on the following additional examples:

- (x) a.    *akɔla*    *no*        *bε-bɔ*        *kania*    *no*        *\*(a)-sɛi*        *no*  
           child    DET    FUT-hit        light    DET    INF-ruin        3<sup>rd</sup>.SG  
           'The child will hit the light and break it.'
- b.    *\*akɔla*    *no*        *bε-bɔ*        *kania*    *no*        *bε-sɛi*        *no*  
           child    DET    FUT-hit        light    DET    FUT-ruin        3<sup>rd</sup>.SG
- (xi) a.    Ama    *bε-tɔ*        *kraman*    *no*        *\*(a)-titi*        (no)  
           A        FUT-buy        dog    DET    INF-raise        3<sup>rd</sup>.SG  
           'Ama will buy the dog and raise it.'
- b.    *\*Ama*    *bε-tɔ*        *kraman*    *no*        *bε-titi*        (no)  
           A        FUT-buy        dog    DET    FUT-raise        3<sup>rd</sup>.SG
- (xii) a.    Ama    *bε-nua*        *bayerε*    *no*        *\*(a)-wɔ*        *\*(a)-di*  
           A        FUT-boil        yam    DET    INF-pound        INF-eat  
           'Ama will boil the yam, pound it, and eat it.'

The nature of the marking on  $V_2$  will not be discussed in detail here, but note that it is obligatory.

A paradigm in the progressive and immediate future reveals similar behavior—both  $V_1$  and  $V_2$  are obligatorily marked.  $V_1$  is marked with the expected aspectual marker, but interestingly,  $V_2$  is marked either with the low-tone *á-* prefix or with an aspectual marker identical to that of  $V_1$ <sup>11</sup>.

PROGRESSIVE<sup>12</sup>

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	b.	*Ama	bɛ-nua	bayerɛ	no	bɛ-wɔ	bɛ-di
		A	FUT-boil	yam	DET	FUT-pound	FUT-eat
(xiii)	a.	Ama	bɛ-hwie	nsuo	no	*(a)-num	
		A	FUT-pour	water	DET	INF-drink	
		'Ama will pour the water and drink it.'					
	b.	*Ama	bɛ-hwie	nsuo	no	bɛ-num	
		A	FUT-pour	water	DET	FUT-drink	

<sup>11</sup> One of my consultants disagrees with the acceptability of marking all verbs in a multi-verb construction with the progressive prefix *re-*. His objections are based on the pragmatic constraints of pounding a yam and eating it concurrently—the yam must be pounded before the eating occurs. However, since this pattern is attested by others (e.g. Osam (2003)) and fieldwork conducted by a fellow student at Swarthmore, Leland Kusmer, reveals examples like my (66b) and (67b)), I consider (66) and (67) to be acceptable.

<sup>12</sup> The observed progressive-marking facts are robust based on these additional examples:

(xiv)	a.	akɔla	no	re-bɔ	kania	no	*(a)-sɛi	no
		child	DET	PROG-hit	light	DET	INF-ruin	3 <sup>rd</sup> .SG
		'The child is hitting the light and breaking it.'						
	b.	akɔla	no	re-bɔ	kania	no	re-sɛi	no
		child	DET	PROG-hit	light	DET	PROG-ruin	3 <sup>rd</sup> .SG
		'The child is hitting the light and breaking it.'						
(xv)	a.	Ama	re-tɔ	kraman	no	*(a)-titi	(no)	
		A	PROG-buy	dog	DET	INF-raise	3 <sup>rd</sup> .SG	
		'Ama is buying the dog and raising it.'						
	b.	Ama	re-tɔ	kraman	no	re-titi	(no)	
		A	PROG-buy	dog	DET	PROG-raise	3 <sup>rd</sup> .SG	
		'Ama is buying the dog and raising it.'						
(xvi)	a.	Ama	re-nua	bayerɛ	no	*(a)-wɔ	*(a)-di	
		A	PROG-boil	yam	DET	INF-pound	INF-eat	
		'Ama is boiling the yam, pounding it, and eating it.'						
	b.	Ama	re-nua	bayerɛ	no	re-wɔ	a-di	
		A	PROG-boil	yam	DET	PROG-pound	INF-eat	
		'Ama is boiling the yam, pounding it, and eating it.'						
	c.	*Ama	re-nua	bayerɛ	no	re-wɔ	re-di	

- (66) a. Kofi re-kyi akɔla no \*(a)-bɔ no  
 K PROG-catch child DET INF-beat 3<sup>rd</sup>.SG  
 'Kofi is catching the child and beating it.'
- b. Kofi re-kyi akɔla no re-bɔ no  
 K PROG-catch child DET PROG-beat 3<sup>rd</sup>.SG  
 'Kofi is catching the child and beating it.'
- (67) a. Ama re-wɔ bayerɛ no \*(a)-di  
 A PROG-pound yam DET INF-eat  
 'Ama is pounding the yam and eating it.'
- b. Ama re-wɔ bayerɛ no re-di  
 A PROG-pound yam DET PROG-eat  
 'Ama is pounding the yam and eating it.'

The data in the progressive aspect thus illustrates that  $V_2$  may be marked in one of two ways: either with the  $\acute{a}$ - prefix or with the progressive aspect marker *re*-.

#### IMMEDIATE FUTURE<sup>13</sup>

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A PROG-boil yam DET PROG-pound PROG-eat  
 'Ama is boiling the yam, pounding it, and eating it.'

It is possible that pragmatic or semantic constraints cause the unacceptability of (c), however, more investigation is needed into multi-verb constructions with more than two verbs to determine whether this fact is robust.

- (xvii) a. Ama re-hwie nsuo no \*(a)-num  
 A PROG-pour water DET INF-drink  
 'Ama is pouring the water and drinking it.'
- b. Ama re-hwie nsuo no re-num  
 A PROG-pour water DET PROG-drink  
 'Ama is pouring the water and drinking it.'

<sup>13</sup> The observed immediate future-marking facts are robust based on these additional examples:

- (xviii) a. akɔla no rebɛ-bɔ kania no \*(a)-sɛi no  
 child DET IMD FUT-hit light DET INF-ruin 3<sup>rd</sup>.SG  
 'The child is about to hit the light and ruin it.'
- b. akɔla no rebɛ-bɔ kania no rebɛ-sɛi no  
 child DET IMD FUT-hit light DET IMD FUT-ruin 3<sup>rd</sup>.SG  
 'The child is about to hit the light and ruin it.'
- (xix) a. Ama rebɛ-tɔ kraman no \*(a)-titi (no)  
 A IMD FUT-buy dog DET INF-raise 3<sup>rd</sup>.SG  
 'Ama is about to buy the dog and raise it.'
- b. Ama rebɛ-tɔ kraman no rebɛ-titi (no)  
 A IMD FUT-buy dog DET IMD FUT-raise 3<sup>rd</sup>.SG

- (68) a. Kofi rebɛ-kyi akɔla no \*(a)-bɔ no  
 K IMD FUT-catch child DET INF-beat 3<sup>rd</sup>.SG  
 'Kofi is about to catch the child and beat it.'
- b. Kofi rebɛ-kyi akɔla no rebɛ-bɔ  
 K IMD FUT-catch child DET IMD FUT-beat  
 no  
 3<sup>rd</sup>.SG  
 'Kofi is about to catch the child and beat it.'
- (69) a. Ama rebɛ-wɔ bayerɛ no \*(a)-di  
 A IMD FUT-pound yam DET INF-eat  
 'Ama is about to pound the yam and eat it.'
- b. Ama rebɛ-wɔ bayerɛ no rebɛ-di  
 Ama IMD FUT-pound yam DET IMD FUT-eat  
 'Ama is about to pound the yam and eat it.'

The data in the immediate future aspect also show that V2 may be marked in one of two ways: either with the *à-* prefix or the immediate future prefix *rebɛ-*.

It is presumed that multi-verb constructions in the perfect aspect behave similarly—V<sub>1</sub> is marked with the perfect aspect marker and V<sub>2</sub> can either be marked with a Low tone *à-* prefix, the infinitive, or the non-High tone bearing perfect marker *a-*. Indeed,

- 
- 'Ama is about to buy the dog and raise it.'
- (xx) a. Ama rebɛ-nua bayerɛ no \*(a)-wɔ \*(a)-di  
 A IMD FUT-boil yam DET INF-pound INF-eat  
 'Ama is about to boil the yam, pound it, and eat it.'
- b. Ama rebɛ-nua bayerɛ no rebɛ-wɔ a-di  
 A IMD FUT-boil yam DET IMD FUT-pound INF-eat  
 'Ama is about to boil the yam, pound it, and eat it.'
- c. \*Ama rebɛ-nua bayerɛ no rebɛ-wɔ  
 A IMD FUT-boil yam DET IMD FUT-pound  
 rebɛ-di  
 IMD FUT-eat  
 'Ama is about to boil the yam, pound it, and eat it.'

As observed previously, it is possible that pragmatic or semantic constraints cause the unacceptability of (c). At present, though, I am unable to provide an explanation for the observed ungrammaticality.

- (xxi) a. Ama rebɛ-hwie nsuo no \*(a)-num  
 A IMD FUT-pour water DET INF-drink  
 'Ama is about to pour the water and drink it.'
- b. Ama rebɛ-hwie nsuo no rebɛ-num  
 A IMD FUT-pour water DET IMD FUT-drink  
 'Ama is about to pour the water and drink it.'

previous analyses of Twi multi-verb constructions (e.g. Osam 2003 and Hellan et al. 2003) treat the *a-* prefix on  $V_2$  as the perfect marker. My data, however, only represents cases in which  $V_2$  takes the infinitival marker<sup>14</sup>.

PERFECT<sup>15</sup>

- (70) Kofi a-kyi akɔla no \*(a)-bɔ no  
K PRF-catch child DET INF-beat 3<sup>rd</sup>.SG  
'Kofi has caught the child and beaten it.'
- (71) Ama a-wɔ bayerɛ no \*(a)-di  
A PRF-pound yam DET INF-eat  
'Ama has pounded the yam and eaten it.'

The habitual aspect behaves similarly to other aspects in relation to multi-verb constructions in that both verbs are obligatorily marked. Habitual constructions differ, however, in that it is not permissible for  $V_2$  to be marked with the infinitival *à-* prefix. Instead,  $V_2$  must be marked by the habitual High tone<sup>16</sup>.

<sup>14</sup> Due to difficulty differentiating between High and Low tone *a-* prefixes on  $V_2$ , examples in which  $V_2$  takes the perfect aspect marker were not obtained.

<sup>15</sup> The observed perfect-marking facts are robust based on the following additional examples:

- (xxii) akɔla no a-bɔ kania no \*(a)-sɛi no  
child DET PERF-hit light DET INF-ruin 3<sup>rd</sup>.SG  
'The child has hit the light and broken it.'
- (xxiii) Ama a-tɔ kraman no \*(a)-titi (no)  
A PERF-buy dog DET INF-raise 3<sup>rd</sup>.SG  
'Ama has bought the dog and raised it.'
- (xxiv) Ama a-nua bayerɛ no \*(a)-wɔ \*(a)-di  
A PERF-boil yam DET INF-pound INF-eat  
'Ama has boiled the yam, pounded it, and eaten it.'
- (xxv) Ama a-hwie nsuo no \*(a)-num  
A PERF-pour water DET INF-drink  
'Ama has poured the water and drank it.'

<sup>16</sup> The observed habitual marking facts are robust based on the following additional examples. Both verbs appear with High tones, though tone is not marked below.

- (xxvi) a. akɔla no bɔ kania no sɛi no  
child DET hit.HAB light DET ruin.HAB 3<sup>rd</sup>.SG  
'The child hits the light and ruins it.'
- b. \*akɔla no bɔ kania no a-sɛi no  
child DET hit.HAB light DET INF-ruin 3<sup>rd</sup>.SG
- (xxvii) a. Ama tɔ kraman no titi (no)  
A buy.HAB dog DET raise.HAB 3<sup>rd</sup>.SG  
'Ama buys the dog and raises it.'

- (72) a. Kofi kyí akɔla no bɔ́ no  
 K catch child DET beat 3<sup>rd</sup>.SG  
 'Kofi catches the child and beats it.'
- b. \*Kofi kyí akɔla no a-bɔ́ no  
 K catch child DET INF-beat 3<sup>rd</sup>.SG
- (73) a. Ama wɔ́ bayerɛ no dí  
 A pound yam DET eat  
 'Ama pounds the yam and eats it.'
- b. \*Ama wɔ́ bayerɛ no a-dí  
 A pound yam DET INF-eat

Moving now to constructions in the past tense, first consider examples in the simple past. We have already seen that in multi-verb constructions in the simple past, both verbs are marked with a lengthened vowel nucleus (cf. (34) and (35)) and the following data show that it is ungrammatical for V<sub>2</sub> to surface without a lengthened vowel nucleus or with the infinitival á- prefix<sup>17</sup>.

- 
- b. \*Ama tɔ́ kraman no a-titi (no)  
 A buy.HAB dog DET INF-raise 3<sup>rd</sup>.SG
- (xxviii) a. Ama nua bayerɛ no wɔ́ di  
 A boil.HAB yam DET pound.HAB eat.HAB  
 'Ama boils the yam, pounds it, and eats it.'
- b. \*Ama nua bayerɛ no a-wɔ́ a-di  
 A boil.HAB yam DET INF-pound INF-eat
- (xxix) a. Ama hwie nsuo no num  
 A pour.HAB water DET drink.HAB  
 'Ama pours the water and drinks it.'
- b. \*Ama hwie nsuo no a-num  
 A pour.HAB water DET INF-drink

<sup>17</sup> The observed simple past tense marking facts are robust based on the following additional examples:

- (xxx) a. \*akɔla no bɔɔ kania no sɛi no  
 child DET hit-PST light DET ruin 3<sup>rd</sup>.SG
- b. \*akɔla no bɔɔ kania no a-sɛi no  
 child DET hit-PST light DET INF-ruin 3<sup>rd</sup>.SG
- (xxxi) a. \*Ama tɔɔ kraman no titi (no)  
 A buy-PST dog DET raise 3<sup>rd</sup>.SG
- b. \*Ama tɔɔ kraman no a-titi (no)  
 A buy-PST dog DET INF-raise 3<sup>rd</sup>.SG

- (74) a. \*Kofi kyii akɔla no bɔ no  
K catch-PST child DET beat 3<sup>rd</sup>.SG
- b. \*Kofi kyii akɔla no a-bɔ no  
K catch-PST child DET INF-beat 3<sup>rd</sup>.SG
- (75) a. \*Ama wɔɔ bayerɛ no di  
A pound-PST yam DET eat
- b. \*Ama wɔɔ bayerɛ no a-di  
A pound-PST yam DET INF-eat

The past tense and habitual aspect marking patterns are thus similar in that both verbs must be marked, but  $V_2$  cannot take the infinitival *á-* prefix.

In constructions bearing both past tense and aspectual marking, the *na* past tense marker appears sentence-initially and  $V_1$  and  $V_2$  are marked as they would be in a non-past construction. This is exemplified in the past perfect, past progressive, and past habitual below.

## PAST PERFECT

- (76) na Kofi a-kyi akɔla no \*(a)-bɔ no  
PST K PERF-pound child DET INF-beat 3<sup>rd</sup>.SG  
'Kofi had caught the child and beaten it.'
- (77) na Ama a-wɔ bayerɛ no \*(a)-di  
PST A PERF-pound yam DET INF-eat  
'Ama had pounded the yam and eaten it.'

## PAST PROGRESSIVE

- (78) a. na Kofi re-kyi akɔla no a-bɔ no  
PST K PROG-catch child DET INF-beat 3<sup>rd</sup>.SG  
'Kofi was catching the child to beat it.'
- b. na Kofi re-kyi akɔla no \*(re)-bɔ no  
PST K PROG-catch child DET PROG-beat 3<sup>rd</sup>.SG  
'Kofi was catching the child and beating it.'

- 
- (xxxii) a. \*Ama nuaa bayerɛ no wɔ di  
A boil-PST yam DET pound eat
- b. \*Ama nuaa bayerɛ no a-wɔ a-di  
A boil-PST yam DET INF-pound INF-eat
- (xxxiii) a. \*Ama hwiee nsuo no num  
A pour-PST water DET drink
- b. \*Ama hwiee nsuo no a-num  
A pour-PST water DET INF-drink

- (79) a. na Ama re-wɔ bayerɛ no a-di  
 PST A PROG-pound yam DET INF-eat  
 'Ama was pounding the yam to eat it.'
- b. na Ama re-wɔ bayerɛ no \*(re)-di  
 PST A PROG-pound yam DET PROG-eat  
 'Ama was pounding the yam and eating it.'

## PAST HABITUAL

- (80) na Kofi kyí akɔla no bɔ́ no  
 PST K catch.HAB child DET beat.HAB 3<sup>rd</sup>.SG  
 'Kofi was catching the child and beating it.'
- (81) na Ama wɔ́ bayerɛ no dí  
 PST A pound.HAB yam DET eat.HAB  
 'Ama was pounding the yam and eating it.'

Note, however, that in (78a) and (79a), a progressive reading of both verbs is unavailable—the presence of *a-* on  $V_2$  disallows a reading similar to that in (78b) and (79b), respectively, and instead requires a purposive/infinitival reading<sup>18</sup>.

- (82) Kofi re-kyi akɔla no a-bɔ́ no  
 K PROG-catch child DET A-beat 3<sup>rd</sup>.SG  
 'Kofi is catching the child to beat it.'

Considering the examples in this section, the data show that each verb in a multi-verb construction must be marked. A summary of the distribution observed thus far is as follows: in the simple past, all verbs must be marked with a lengthened vowel nucleus; in the future,  $V_1$  is marked with the future prefix and  $V_2$  must be marked with the infinitival *à-*; in perfect, progressive, and immediate future aspects,  $V_1$  is marked aspectually and  $V_2$  is either marked with the infinitival *à-* or with a duplicated aspectual marker; and in the habitual, all verbs must be marked with a High tone to signify habitual aspect.

The question naturally arises whether  $V_1$  and  $V_2$  can differ in tense/aspect and the data show that this is only possible in some situations. Semantic constraints can be attributed to the unacceptability of certain combinations of tense/aspect, such as  $V_{1FUT}$  and  $V_{2PAST}$ , for example.

- (83) #Kofi bɛ-kyi akɔla no bɔɔ́ no  
 K FUT-catch child DET beat-PST 3<sup>rd</sup>.SG  
 'Kofi will catch the child and did beat it.'

<sup>18</sup> A purposive reading is also available for other multi-verb constructions in which the infinitival *à-* appears on  $V_2$ , so this fact is not surprising.

- (xxxiv) Kofi re-kyi akɔla no a-bɔ́ no  
 K PROG-catch child DET A-beat DET  
 'Kofi is catching the child to beat it.'

Still, it is possible that the perceived unavailability of a progressive reading of both verbs is speaker-specific as this judgment was confirmed with only one consultant. Regardless, the reasons why a progressive reading is not available in (78ba) and (79a) are not discussed here.

- (84) #Ama bɛ-wɔ bayerɛ no dii yɛ  
 A FUT-pound yam DET eat-PST do  
 'Ama will pound the yam and did eat it.'

However, a combination of  $V_{1PST}$  and  $V_{2FUT}$  is conceptually (i.e. in terms of event structure) possible, yet ungrammatical.

- (85) \*Kofi kyii akɔla no bɛ-bɔ no  
 K catch-PST child DET FUT-beat 3<sup>rd</sup>.SG  
 'Kofi caught the child and will beat it.'

- (86) \*Ama wɔɔ bayerɛ no bɛ-di yɛ  
 A pound-PST yam DET FUT-eat do  
 'Ama pounded the yam and will eat it.'

We have previously observed that Twi does not permit  $V_2$  to be marked with the future marker *bɛ*- (cf. (64b) and (65b)), thus the unacceptability of (85) and (86) is expected. The observed ungrammaticality seems to suggest that the inflectional patterns on  $V_1$  and  $V_2$  are due less to semantic constraints and more to grammatical principles regarding the functional projection of the predicates.

A conceptually possible combination of aspects, however,  $V_{1PERF}$  and  $V_{2PROG}$ , is grammatical.

- (87) Kofi a-kyi akɔla no re-bɔ no  
 K PERF-catch child DET PROG-beat 3<sup>rd</sup>.SG  
 'Kofi has caught the child and is beating it.'

- (88) Ama a-wɔ bayerɛ no re-di  
 A PERF-pound yam DET PROG-eat  
 'Ama has pounded the yam and is eating it.'

This mismatch is not surprising considering the earlier observation that Twi permits aspect marking on  $V_2$  in multi-verb constructions (cf. (66b) and (67b) in the progressive aspect). However, the marking of differing aspects on  $V_1$  and  $V_2$ , though attested in previous Twi literature (e.g. Osam 2003), is surprising when considering cross-linguistic accounts of multi-verb constructions which usually note uniformity of tense/aspect in non-coordinate structures. This surprising distribution warrants investigation and indeed, extraction facts suggest that examples such as (87) and (88) are instances of covert coordination.

- (89) \*kyi na Kofi a-kyi akɔla no re-bɔ no  
 catch FOC K PERF-catch child DET PROG-beat 3<sup>rd</sup>.SG  
 'It is catching that Kofi has done to the child and is beating it.'

- (90) \*wɔ na Ama a-wɔ bayerɛ no re-di  
 pound FOC A PERF-pound yam DET PROG-eat  
 'It is pounding that Ama has done to the yam and is eating it.'

The inability to predicate cleft  $V_1$  can be attributed to coordinate island constraints, thus structures in which differing aspectual forms co-occur on verbs will not be further discussed. However, the question arises whether extraction facts will reveal similar

characterizations of examples in which the same aspect is marked on both verbs. Consider predicate clefting in examples (66) and (67), repeated below.

- (91) a. Kofi re-kyi akɔla no re-bɔ no  
 K PROG-catch child DET PROG-beat 3<sup>rd</sup>.SG  
 'Kofi is catching the child and beating it.'
- b. kyi na Kofi re-kyi akɔla no a-bɔ  
 catch FOC K PROG-catch child DET INF-beat  
 no  
 3<sup>rd</sup>.SG  
 'It is catching that Kofi is doing to the child and beating it.'
- c. \*kyi na Kofi re-kyi akɔla no re-bɔ  
 catch FOC K PROG-catch child DET PROG-beat  
 no  
 3<sup>rd</sup>.SG
- (92) a. Ama re-wɔ bayerɛ no re-di  
 A PROG-pound yam DET PROG-eat  
 'Ama is pounding the yam and eating it.'
- b. wɔ na Ama re-wɔ bayerɛ no a-di  
 pound FOC A PROG-pound yam DET INF-eat  
 'It is pounding that Ama is doing to the yam and eating it.'
- c. \*wɔ na Ama re-wɔ bayerɛ no re-di  
 pound FOC A PROG-pound yam DET PROG-eat

Based on the above extraction facts, it appears that coordinate island effects are exhibited in cases in which the progressive marker *re-* appears on  $V_2$ , but that no such effects are exhibited when the infinitival marker appears on  $V_2$ . Indeed, these facts are also observed when  $V_2$  in a multi-verb construction is marked with the immediate future marker *rebɛ-*.

- (93) a. kyi na Kofi rebɛ-kyi akɔla no a-bɔ  
 catch FOC K IMD FUT-catch child DET INF-beat  
 no  
 3<sup>rd</sup>.SG  
 'It is catching that Kofi is about to be doing to the child and beating it.'
- b. \*kyi na Kofi rebɛ-kyi akɔla no rebɛ-bɔ  
 catch FOC K IMD FUT-catch child DET IMD FUT-beat  
 no  
 3<sup>rd</sup>.SG
- (94) a. wɔ na Ama rebɛ-wɔ bayerɛ no a-di  
 pound FOC A IMD FUT-pound yam DET INF-eat  
 'It is pounding that Ama is about to be doing to the yam and eating it.'

- b. \*wɔ na Ama rebɛ-wɔ bayerɛ no  
 pound FOC A IMD FUT-pound yam DET  
 rebɛ-di  
 IMD FUT-eat

I thus treat cases in which progressive and immediate future aspect are marked on all verbs in a multi-verb construction as cases of covert coordination and their structure and derivation will not be discussed further. I further assume that the ungrammaticality observed when attempting to predicate cleft  $V_1$  from multi-verb constructions in the perfect aspect can be attributed to a coordinate structure as well, though it is not clear whether my speakers perceive the perfect aspect marker or the infinitival marker on  $V_2$ <sup>19</sup>.

- (95) \*kyi na Kofi a-kyi akɔla no a-bɔ no  
 catch FOC K PERF-catch child DET PERF/INF-eat 3<sup>rd</sup>.SG
- (96) \*wɔ na Ama a-wɔ bayerɛ no a-di  
 pound FOC A PERF-pound yam DET PERF/INF-eat

Finally, consider the grammaticality of predicate clefting of  $V_1$  in examples in the habitual aspect.

- (97) kyi na Kofi kyi akɔla no bɔ no  
 catch FOC K catch.HAB child DET beat.HAB 3<sup>rd</sup>.SG  
 'It is catching the Kofi does to the child and beats it.'
- (98) wɔ na Ama wɔ bayerɛ no di  
 pound FOC A pound.HAB yam DET eat.HAB  
 'It is pounding that Ama does to the yam and eats it.'

The ability to predicate cleft  $V_1$  in such examples is initially surprising considering that aspect is marked on both  $V_1$  and  $V_2$ , but recall that the manifestation of the habitual aspect in these examples is a High tone on the verb root. It seems thus that predicate clefting of  $V_1$  is only disallowed when the aspect on  $V_2$  is a phonetically realized. I save further explanation of these observed facts until Section 4, but at present, I consider multi-verb constructions in which a phonetically realized aspect prefix is present on  $V_2$  as covert coordination and do not discuss them further.

In summary, note the obligatory marking of both  $V_1$  and  $V_2$  in non-coordinate multi-verb constructions; in the past tense and habitual aspect,  $V_2$  is marked similarly to  $V_1$ , but in the future tense and other aspects,  $V_2$  is marked with the infinitival  $\dot{a}$ -prefix. This obligatory marking of all verbs in a multi-verb construction seems to violate traditional descriptive characterizations of SVCs—the marking of tense/aspect on only one of the verbs that composes it (e.g. Stewart 2001). I show in Section 4, however, that these facts are compatible with an analysis of serialization. Having discussed tense/aspect marking on multi-verb constructions, I now turn to a brief descriptive characterization of polarity marking.

<sup>19</sup> I assume that the marker on  $V_2$  in (95) and (96) is the perfect marker based on patterns observed when other aspect markers appear on  $V_2$  (cf. (91 – 94)). It is thus also assumed that constructions in the perfect aspect with the infinitival marker on  $V_2$  would allow predicate clefting of  $V_1$ , but I have no direct evidence to support this at present.

## 3.4 Polarity

In Twi, negation is marked with a nasal prefix. The following sentences demonstrate negation marking in multi-verb constructions in the simple past.

- (99) a. Kofi an-kyi akɔla no an-bɔ  
 K NEG.PST-pound child DET NEG.PST-pound  
 no  
 3<sup>rd</sup>.SG  
 ‘Kofi didn’t catch the child and beat it.’
- b. \*Kofi an-kyi akɔla no bɔɔ no  
 K NEG.PST-pound child DET pound-PST 3<sup>rd</sup>.SG
- b. \*Kofi kyii akɔla no an-bɔ no  
 K pound-PST child DET NEG.PST-pound 3<sup>rd</sup>.SG
- (100) a. Ama an-wɔ bayerɛ no an-di  
 A NEG.PST-pound yam DET NEG.PST-pound  
 ‘Ama didn’t pound the yam and eat it.’
- b. \*Ama an-wɔ bayerɛ no dii yɛ  
 A NEG.PST-pound yam DET eat-PST do
- c. \*Ama wɔɔ bayerɛ no an-di  
 A pound-PST yam DET NEG.PST-pound

It is important to note that the (b) and (c) examples are unacceptable in two contexts: one, when the intended meaning is that both events denoted by  $V_1$  and  $V_2$  did not occur and two, when the intended meaning is that the event denoted by the negated verb did not occur while the event denoted by the other verb did occur. This is evidence that  $V_1$  and  $V_2$  must agree in polarity; in the affirmative, neither is marked and in the negative, both are marked<sup>20</sup>. A structure accounting for a negation marking on both verbs is proposed in Section 4, but adverbial modification of multi-verb construction is first discussed.

<sup>20</sup> The observed negation facts are robust based on these additional examples:

- (xxxv) a. akɔla no an-bɔ kania no an-sɛi no  
 child DET NEG.PST-hit light DET NEG.PST-ruin 3<sup>rd</sup>.SG  
 ‘The child didn’t hit the light and ruin it.’
- b. \*akɔla no an-bɔ kania no sɛi no  
 child DET NEG.PST-hit light DET ruin-PST 3<sup>rd</sup>.SG
- c. \*akɔla no bɔɔ kania no an-sɛi no  
 child DET hit-PST light DET NEG.PST-ruin 3<sup>rd</sup>.SG
- (xxxvi) a. Ama an-tɔ kraman no an-titi (no)  
 A NEG.PST-buy dog DET NEG.PST-raise (3<sup>rd</sup>.SG)  
 ‘Ama didn’t buy the dog and raise it.’
- b. \*Ama an-tɔ kraman no titii no/yɛ

## 3.5 Adverbial Modification

Adverbial modification is not often discussed in relation to multi-verb constructions, but recall that Stewart (2001) uses distribution and scope of adverbials to differentiate between covertly coordinated structures and different types of SVCs (cf. Section 2.2). I thus briefly discuss adverbial modification in Twi multi-verb constructions.

In Twi, manner and temporal adverbs can appear to the right of the verb phrase, but not to the left of the verb phrase.

- (101) a. Ama wɔɔ bayerɛ no ntɛm  
 A pound-PST yam DET quickly  
 'Ama pounded the yam quickly.'
- b. \*Ama ntɛm wɔɔ bayerɛ no  
 A quickly pound-PST yam DET
- (102) a. Ama tɔɔ kraman no ɛnura  
 A sell-PST dog DET yesterday  
 'Ama sold the dog yesterday.'
- b. \*Ama ɛnura tɔɔ kraman no  
 A yesterday sell-PST dog DET

The behavior of multi-verb constructions under adverbial manipulation suggests an event structure in which each  $V_1$  and  $V_2$  denote a separate event individually modifiable by an adverbial. Multi-verb constructions modified by the manner adverbs *ntɛm* 'quickly' and

- 
- |              |  |              |        |     |               |                        |
|--------------|--|--------------|--------|-----|---------------|------------------------|
|              | A  | NEG.PST-buy  | dog    | DET | raise-PST     | 3 <sup>rd</sup> .SG/do |
| c.           | *Ama   | tɔɔ          | kraman | no  | an-titi       | (no)                   |
|              | A  | buy-PST      | dog    | DET | NEG.PST-raise | (3 <sup>rd</sup> .SG)  |
| (xxxvii) a.  | Ama  | an-nua       | bayerɛ | no  | an-wɔɔ        | an-di                  |
|              | A  | NEG.PST-boil | yam    | DET | NEG.PST-pound | NEG.PST-eat            |
|              | 'Ama didn't boil the yam, pound it, and eat it.' |              |        |     |               |                        |
| b.           | *Ama   | an-nua       | bayerɛ | no  | wɔɔ           | yɛ                     |
|              | A  | NEG.PST-boil | yam    | DET | pound-PST     | do                     |
|              | dii  | yɛ           |        |     |               |                        |
|              | eat-PST  | do           |        |     |               |                        |
| c.           | *Ama   | nuaa         | bayerɛ | no  | an-wɔɔ        | an-di                  |
|              | A  | boil-PST     | yam    | DET | NEG.PST-pound | NEG.PST-eat            |
| (xxxviii) a. | Ama  | an-hwie      | nsuo   | no  | an-num        |                        |
|              | A  | NEG.PST-pour | water  | DET | NEG.PST-drink |                        |
|              | 'Ama didn't pour the water and drink it.'        |              |        |     |               |                        |
| b.           | *Ama   | an-hwie      | nsuo   | no  | num           | yɛ                     |
|              | A  | NEG.PST-pour | water  | DET | drink-PST     | do                     |
| c.           | *Ama   | hwie         | nsuo   | no  | an-num        |                        |
|              | A  | pour-PST     | water  | DET | NEG.PST-drink |                        |

*brɛw* ‘slowly’ as well as the temporal adverbs *ɛnura* ‘yesterday’ and *ɛyɛ* ‘today’ are exemplified below. Individual modification of  $V_1$  is demonstrated first.

- (103) a. Ama wɔɔ bayerɛ no ntɛm dii yɛ  
 A pound-PST yam DET quickly eat-PST do  
 ‘Ama pounded the yam quickly and ate it,’ (such that only the  
 pounding was quick).
- b. Ama wɔɔ bayerɛ no ɛnura dii  
 A pound-PST yam DET yesterday eat-PST  
 yɛ  
 do  
 ‘Ama pounded the yam yesterday and ate it,’ (such that only the  
 pounding occurred yesterday).
- c. Kofi kyii akɔla no ntɛm bɔɔ no  
 K catch-PST child DET quickly beat-PST 3<sup>rd</sup>.SG  
 ‘Kofi caught the child quickly and beat it,’ (such that only the  
 catching was quick).
- d. Kofi kyii akɔla no ɛnura bɔɔ  
 K catch-PST child DET yesterday beat-PST  
 no  
 3<sup>rd</sup>.SG  
 ‘Kofi caught the child yesterday and beat it,’ (such that only the  
 catching occurred yesterday).

As the above examples demonstrate, inserting an adverb to the right of  $V_1$  leads to an interpretation in which only the event denoted by  $V_1$  is modified. Inserting an adverb to the right of  $V_2$ , however, leads to ambiguity.

- (104) a. Ama wɔɔ bayerɛ no dii yɛ ntɛm  
 A pound-PST yam DET eat-PST do quick  
 ‘Ama pounded the yam and ate it quickly,’ (such that either only the  
 eating was quick or both the pounding and the eating were quick).
- b. Ama wɔɔ bayerɛ no dii yɛ  
 A pound-PST yam DET eat-PST do  
 ɛnura  
 yesterday  
 ‘Ama pounded the yam and ate it yesterday,’ (such that either only  
 the eating occurred yesterday or both the pounding and the eating  
 occurred yesterday).
- c. Kofi kyii akɔla no bɔɔ no ntɛm  
 K catch-PST child DET beat-PST 3<sup>rd</sup>.SG quickly  
 ‘Kofi caught the child and beat it quickly,’ (such that either only the  
 beating was quick or both the catching and beating were quick).

- d. Kofi kyii akɔla no bɔɔ no  
 K catch-PST child DET beat-PST 3<sup>rd</sup>.SG  
 ɛnura  
 yesterday  
 ‘Kofi caught the child and beat it yesterday,’ (such that either only the beating occurred yesterday or both the catching and beating occurred yesterday).

Crucially, these examples show that it is possible to modify each verb individually (as well as the construction as a whole), thus it is predicated that constructions in which differing adverbs follow each verb are acceptable. This prediction is borne out in the following examples.

- (105) a. Ama wɔɔ bayerɛ no brɛw dii no  
 A pound-PST yam DET slow eat-PST 3<sup>rd</sup>.SG  
 ntɛm  
 quick  
 ‘Ama pounded the yam slowly and ate it quickly.’
- b. Kofi kyii akɔla no brɛw bɔɔ no  
 K catch-PST child DET slow beat-PST 3<sup>rd</sup>.SG  
 ntɛm  
 quick  
 ‘Kofi caught the child slowly and beat it quickly.’
- c. Ama wɔɔ bayerɛ no ɛnura dii  
 A pound-PST yam DET yesterday eat-PST  
 no ɛnɛ  
 3<sup>rd</sup>.SG today  
 ‘Ama pounded the yam yesterday and ate it today.’
- d. Kofi kyii akɔla no ɛnura bɔɔ  
 K catch-PST child DET yesterday beat-PST  
 no ɛnɛ  
 3<sup>rd</sup>.SG today  
 ‘Kofi caught the child yesterday and beat it today.’

The individual modification of the event denoted by each verb is a pattern that Stewart (2001) observes is not possible in what he characterizes as serializing structures. The Twi facts, then, suggest two separate events in Twi multi-verb constructions and provide evidence against a structural analysis like Stewart’s. As we will see, the structure proposed in the following section is able to account for the observed distribution and scope of adverbials in Twi.

To summarize Section 3, I have descriptively characterized Twi multi-verb constructions in relation to pronominal realization, extraction of arguments and predicates, tense/aspect/polarity, and adverbial modification. The patterns observed motivate an analysis in which  $V_1$  is hierarchically superior to  $V_2$  and each verb has a highly articulated extended projection, containing at least tense and polarity.

#### 4: Structure of Multi-Verb Constructions in Twi

Having shown the descriptive characteristics of Twi multi-verb constructions in the previous section, I now propose a structural analysis. The most significant conclusion I draw is that the constructions investigated in this thesis contain multiple clauses, which differentiates them from traditionally defined SVCs (cf. Section 2.2). To account for multiple clauses, I propose a structure similar to Aboh (2009), containing a functional  $V_1$  that takes a lexical  $V_2$  as its complement. As we will see, however,  $V_2$ 's projection must extend to TP in order to account for tense/infinitival marking on consecutive verbs in the constructions. An Aboh-style analysis also explains the nature of apparent 'object sharing' in multi-verb constructions; 'object sharing' exists in the sense that there is only one syntactic object; however, the object does not fulfill the thematic roles of both verbs and therefore should not be characterized as 'true syntactic object sharing' (cf. Baker 1989 and Hiraiwa and Bodomo 2008). An account in which a lexical  $V_2$  is the complement to a functional  $V_1$  is initially motivated by its ability to allow for the highly articulated extended projection that  $V_2$  in Twi exhibits. Such an analysis does, however, rely on the assumption that the constructions contain no empty category *pro* (cf. Stewart 2001 and Collins 1997), which is a somewhat unsubstantiated assumption considering that the Twi data provide no evidence directly against the existence of *pro*. Before I explain the proposed analysis, I discuss underlying assumptions such as these and show the inability of some previously proposed structural analyses to account for the Twi data.

##### 4.1: Toward a Functional $V_1$ and Lexical $V_2$ Analysis

In this section, I discuss motivation for adopting an analysis of Twi multi-verb constructions in which  $V_1$  is functional, taking a lexical  $V_2$  and its extended projection as its complement. I conclude in favor of this analysis due to the inability of other analyses such as Larson's (2010) and Hiraiwa and Bodomo's (2008) to account for the Twi data. Assuming that Twi multi-verb constructions do not rely on *pro* to mediate 'object sharing' further discounts previously proposed analyses such as Collins (1997) and Stewart (2001). These considerations are outlined below.

As discussed in Section 3, the availability of extraction of  $V_1$  from some multi-verb constructions, but not others, differentiates between covertly coordinated and non-coordinate structures. Extraction of  $V_1$  is only allowed in certain cases; the objects of all verbs must be co-referent and no phonetically realized aspectual marker can appear on  $V_2$ . Thus, I treat examples in which these two requirements are met as non-coordinate structures. Having identified true non-coordinate structures in Twi, positing Larson's (2010) analysis to account for the Twi data is not sufficient. Her account was initially appealing due to the tense-marking similarities between Baule and Twi—both require the marking of consecutive verbs—however, the expected coordinate island constraints of paratactic structures would presumably prevent predicate clefting of  $V_1$ .

As such, I turn to discussing previous analyses that explain serializing structures. These can be divided into two groups based on their descriptions of the apparent 'object sharing' present in constructions such as the following repeated example.

- (106) Ama    wɔɔ                    bayerɛ no            dii                    yɛ  
           A        pound-PST        yam    DET        eat-PST            do  
           'Ama pounded the yam and ate it.'

Such a structure either contains only one true syntactic object (Hiraiwa and Bodomo 2008, Baker 1989, and Aboh 2009) or 'object sharing' is mediated by a null category (Stewart

2001, Collins 1997). With this division in the literature in mind, I now address how Twi multi-verb constructions accomplish ‘object sharing’.

An analysis relying on a single syntactic object is initially motivated because Twi provides no evidence in support of the existence of an empty category. Stewart (2001), for example, licenses an empty category in his consequential SVC based on the existence of two E positions, one of which asymmetrically C-commands the other. The lower E position is referentially dependent upon the higher E position ‘in a sort of quantifier-indexing relation,’ thus the lower E is a local operator that binds this empty category (Stewart 2001:56). Stewart posits these two E positions based on the distribution of Infl-type adverbs that occur to the left of the verb, but Twi lacks a rich adverbial system; consequently, I find no evidence of such Infl-type adverbs. Indeed, when manner and temporal adverbs are used, they cannot occur to the left of the verb.

(107) \*Ama ntɛm wɔɔ bayerɛ no  
 A quick pound-PST yam DET  
 ‘Ama quickly pounded the yam.’

(108) \*Ama ɛnora wɔɔ bayerɛ no  
 A yesterday pound-PST yam DET  
 ‘Ama pounded the yam yesterday.’

Twi exhibits an additional type of adverb, *amparaampara* ‘truly’, which attaches vP-externally; however, *amparaampara* appears either sentence-initially or sentence-finally.

(109) \*Ama amparaampara wɔɔ bayerɛ no  
 A truly pound-PST yam DET  
 ‘Ama truly pounded the yam.’

Since adverbs in Twi do not seem to provide evidence for the two E positions that Stewart identifies, there is no immediate explanation for the licensing of an empty category.

Collins (1997) licenses an empty category by positing that in Ewe, *pro* can be governed by a V head. This assumption could also be made for Twi, but two observations suggest an analysis in which ‘object sharing’ is accomplished by some other means. First, *pro* in Collins’ analysis is independently motivated by evidence from the postposition *yi* (cf. Section 2.2)—the presence of *yi* after  $V_2$  indicates an empty category—but I have observed no such independent motivation for *pro* in Twi. Second, the presence of an overt pronoun after  $V_2$  in constructions such as the repeated example below is not explained under an empty category analysis.

(110) Kofi kyii akɔla no bɔɔ \*(no)  
 K catch-PST child DET beat-PST 3<sup>rd</sup>.SG  
 ‘Kofi caught the child and beat it.’

As we saw in Section 3, such constructions are only differentiated from those without an overt pronoun after  $V_2$  by object animacy; the object in (110) requires an overt pronoun due to animacy while an inanimate object pronoun is null. The two types of constructions behave identically with respect to extraction, tense/aspect/polarity marking, and adverbial manipulation, suggesting the same structural analysis for both; an empty category analysis, however, would structurally differentiate between the two because it would only be applicable to constructions in which the object is inanimate. As I am partial to a structural

analysis that can account for both types, I assume that ‘object sharing’ is not mediated by the empty category *pro*. At present, I rely on this lack of evidence in support of an empty category analysis and assume a single syntactic object.

Analyses reliant on a structure in which only one syntactic object exists are those proposed by Baker (1989), Hiraiwa and Bodomo (2008), and Aboh (2009). In order to avoid positing a ternary branching structure, I eliminate Baker’s analysis of a double-headed VP and instead consider Hiraiwa and Bodomo’s theory, relying on parallel merge of both verbs to one syntactic object, and Aboh’s theory, relying on a functional  $V_1$ , a lexical  $V_2$ , and object movement. Initially, my favoring of Aboh’s analysis over a parallel merge account is driven not by direct evidence against such an account, but by a lack of evidence in favor of it. The evidence Hiraiwa and Bodomo (2008) use to motivate a parallel merge theory is the availability of predicate clefting and object pied-piping in Dàgáárè, but Twi predicate clefting patterns differ from Dàgáárè in several significant ways. Recall from Section 3.2 that predicate clefting of  $V_2$  is disallowed in Twi, which contrasts with patterns observed in Dàgáárè. An additional difference is that Dàgáárè permits pied piping of  $V_2$  along with  $V_1$  as well as pied-piping of the object along with  $V_1$ ,  $V_2$ , or  $V_1+V_2$ , whereas pied-piping of objects and/or  $V_2$  is not allowed in Twi.

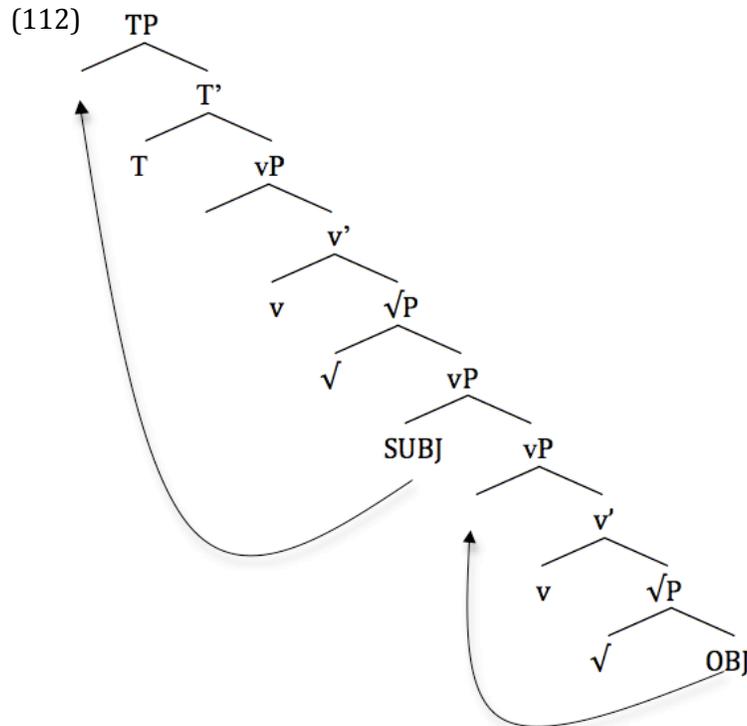
- (111) a. \*wɔ bayerɛ no na Ama wɔɔ bayerɛ  
 pound yam DET FOC A pound-PST yam  
 no dii yɛ  
 DET eat-PST do  
 ‘It was pounding the yam that Ama did to the yam and ate it.’
- b. \*bayerɛ no wɔ na Ama wɔɔ bayerɛ  
 yam DET pound FOC A pound-PST yam  
 no dii yɛ  
 DET eat-PST do  
 ‘It was pounding the yam that Ama did to the yam and ate it.’
- c. \*wɔ bayerɛ no di na Ama wɔɔ bayerɛ  
 pound yam DET eat FOR A pound-PST yam  
 no dii yɛ  
 DET eat-PST do  
 ‘It was pounding the yam and eating it that Ama did to the yam.’

It is Dàgáárè’s ability to pied-pipe objects with both  $V_1$  and  $V_2$  in predicate cleft constructions that leads Hiraiwa and Bodomo (2008) to the conclusion that the object forms a syntactic constituent with both  $V_1$  and  $V_2$ , thereby motivating a parallel merge analysis. Twi predicate cleft facts, however, lack the motivation for such an analysis.

Furthermore, there is additional evidence to reject a parallel merge analysis—namely that a parallel merge analysis is not compatible with the rich extended projection that Twi  $V_2$  exhibits. Indeed,  $V_2$  must have an extended projection to TP in order to account for cases in which the simple past tense marking or the infinitival marker are observed on  $V_2$ , but Hiraiwa and Bodomo’s (2008) double-headed AspP analysis does not allow for such an extended projection. Furthermore, an analysis in which parallel merge of  $V_1$  and  $V_2$  with the object is followed by movement of the object to Spec, AspP would not explain the presence of the observed overt pronoun after  $V_2$  in some Twi multi-verb constructions.

For the moment, then, consider a structure such as Aboh’s (2009) in which the object and subject are introduced by a lexical  $V_2$ , after which  $V_2$  and its extended projection

merge with  $V_1$ . A functional  $V_1$  does not assign its complement a thematic role, unlike a lexical verb, thus the object is thematically related to  $V_2$  and movement generates the  $V_1$ -OBJ- $V_2$  word order. An illustration of such a structure is presented below, but the extended projection of  $V_2$  is simplified.



A structure like (112) is, at present, best able to explain the Twi data, but in order to apply this structure to Twi multi-verb constructions, it is first necessary to discuss the extended projection of the verb root.

#### 4.2: Characterizing the Twi Middle Field

In order to better understand the extended projection of  $V_2$  in multi-verb constructions, we briefly put aside the structure represented in (112) and consider the characterization of the Twi middle field in mono-clausal sentences; I follow Kandybowicz (2010)<sup>21</sup>.

Consider an example in the simple past tense:

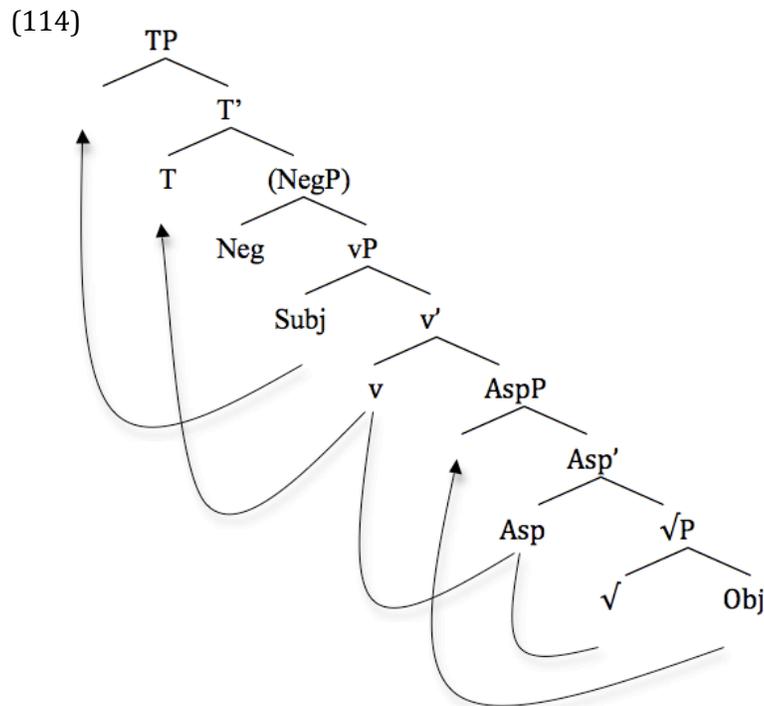
- (113) Ama wɔɔ bayerɛ no.  
 A pound-PST yam DET  
 'Ama pounded the yam.'

<sup>21</sup> Kandybowicz (2010) posits an AspP within the vP shell structure in Twi. Evidence for this 'inner aspect' is the fact that in-situ subjects in Twi precede aspect morphemes. In the example below, the past tense marker *na* appears in the T head, thus the subject does not raise to Spec, TP in this case.

- (xxxix) Yaw kaa sɛ na Kofi re-sa (Kandybowicz 2010:10)  
 Y say-PST COMP PST K PROG-dance  
 'Yaw said that Kofi was dancing.'

The AspP is obligatory in the vP shell structure because Asp probes Obj and values its case features.

The derivation of this mono-clausal sentence begins with the merge of Obj with  $\sqrt{}$  under  $\sqrt{P}$ . In the simple past, aspect is phonetically null, so  $\sqrt{P}$  merges with a contentless Asp head. Contentless Asp heads, assigning case without contributing aspectual content, bear EPP features, triggering movement of Obj to Spec, AspP in order to receive case. Following, AspP merges with v. I assume head movement of  $\sqrt{}$  to v and subsequent spell-out of AspP since v is a phase head. Subj is merged next, followed by the contentless  $T_{\text{PAST}}$  head, which, similar to contentless Asp heads, bears EPP features and triggers movement of Subj to Spec, TP in order to receive case. Further head movement of  $\sqrt{}$  to T results in the lengthened verb nucleus that appears in simple past constructions. In order to completely expand the structure, an optional NegP is added to this functional projection<sup>22</sup>.



The derivation of structures in which the complement of the verb is not phonetically realized is also relevant to the present characterization of multi-verb constructions because we have seen examples in which an overt object after  $V_2$  is lacking. Without an overt object after  $V_2$  in the simple past, the presence of  $y\epsilon$  following the verb is obligatory.

- (115) Ama wɔɔ bayerɛ no dii \*(yɛ)  
 A pound-PST yam DET eat-PST do  
 'Ama pounded the yam and ate it.'

Similarly, in mono-clausal sentences in which no overt object follows the verb,  $y\epsilon$  is required.

<sup>22</sup> Negation co-varies with tense and aspect which motivates the high placement of NegP (Kandybowicz 2010).

- (116) Ama saa \*(yɛ)  
 A dance-PST do  
 'Ama danced.'

Recall from Section 3.3 that to account for the presence of  $y\epsilon$ , Kandybowicz (2010) argues that  $y\epsilon$  is an additional copy of the verb root, a form of do-insertion conditioned by prosodic considerations. I now briefly discuss these prosodic considerations as they are important to understanding the derivation of multi-verb constructions both in cases where  $y\epsilon$  is observed and in cases where an overt pronoun after  $V_2$  is present.

Kandybowicz's (2010) do-insertion analysis relies on three assumptions: first, that syntactic and prosodic constituents correspond to one other; second, that transferred syntactic constituents are prosodic domains; and third that syntactic and prosodic correspondence/isomorphy requires edge alignment and therefore edge realization at PF. Based on Chomsky (2001) and Kandybowicz (2009), "edge" is defined in syntactic terms; thus in Twi, given a Spell-Out domain of AspP, an edge can be realized by phonetic content in one of three positions: Asp; Spec, Asp; and Adjunct, Asp. Following from this, the necessary syntactic and prosodic alignment dictates that at PF, one of these three positions must be realized. To exemplify do-insertion, consider (116) in which  $\sqrt{\text{ }}$  merges with a contentless Asp head under AspP, which then merges with  $v$  under  $v$ P, after which, head movement of  $\sqrt{\text{ }}$  to  $v$  (via Asp) occurs. The progression of the derivation to  $v$ , a phase head, necessitates that  $v$ 's complement, AspP, be sent to Spell-Out, however, assuming deletion of copies due to linearization (Nunes 1999) the movement of  $\sqrt{\text{ }}$  to  $v$  has left no phonetic content in Asp. The lack of an internal argument in the derivation means that Spec, Asp is not merged and no adjunct to AspP is present, thus AspP is phonetically empty and the derivation crashes at PF. If, however, the impoverished copy of the verb root—left behind after  $\sqrt{\text{ }}$  to head movement—is pronounced in Asp, edge conditions are satisfied and the derivation is successful.

Relevant to this discussion of multi-verb constructions in Twi are cases in which do-insertion is obviated. Kandybowicz (2010) observes that adverbial modification and phonetic realization of an object obviate do-insertion, which is to be expected—adverbs appear as adjuncts to AspP in Twi and objects move to Spec, Asp (when aspect has no phonetic realization), thereby providing phonetic realization of an edge. Furthermore, obviation of do-insertion occurs when an overt head is present in Asp, Neg, or T. When aspect is phonetically realized, by the progressive aspect marker *re-*, for example,  $\sqrt{\text{ }}$  is blocked from moving by the contentful Asp head and it thus surfaces in its base-generated position. Upon Spell-Out, then, edge conditions are satisfied by  $\sqrt{\text{ }}$ +Asp and no do-insertion is required. In cases where Neg or T are phonetically realized,  $\sqrt{\text{ }}$  is permitted to move as high as  $v$ , but deletion of all lower copies would leave no phonetic realization of an edge in AspP. The lack of do-insertion in these cases is explained through the assumption that  $v$  does not require morphophonological support; phono-syntactic alignment thus forces the pronunciation of a lower root copy in Asp, but nothing necessitates that a higher copy in  $v$  is pronounced (Kandybowicz 2010).

With this characterization of the Twi middle field and the observed edge conditions in mind, I return to the task at hand—explaining the structure and derivation of multi-verb constructions.

#### 4.3: The Derivation of Multi-Verb Constructions

Based on Aboh's (2009) account of SVCs and Kandybowicz's (2010) characterization of the middle field in Twi, I now explain the derivation of Twi multi-verb constructions. As we

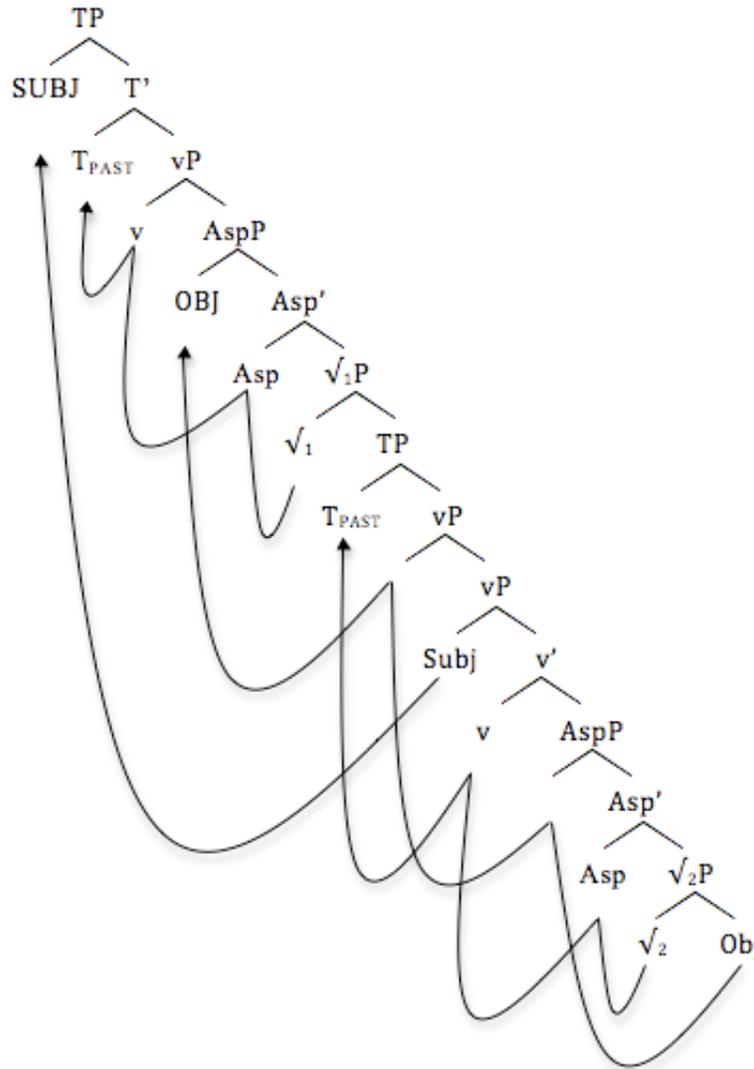
have seen,  $V_2$  requires an extended projection to TP, thus motivating an analysis in which multiple verbs have projections extending to the TP level.

Consider first an example in the simple past tense with an inanimate object, such as the repeated example below.

- (117) Ama    wɔɔ                    bayerɛ no            dii                    yɛ  
           A        pound-PST        yam    DET        eat-PST            do  
           'Ama pounded the yam and ate it.'

I argue that the derivation proceeds as follows: Obj merges with  $\sqrt{2}$  under  $\sqrt{2}P$ , which merges with a contentless Asp head. Obj then moves to Spec, Asp to receive case, after which AspP merges with v. Head movement of  $\sqrt{2}$  to v through Asp and movement of Obj to the edge of the vP domain in order to prevent freezing leaves the edge of AspP phonetically null, requiring a lower copy of the verb root to be pronounced (do-insertion). The external argument, Subj, is next introduced under a higher vP which merges with  $T_{PAST}$ . Movement of  $\sqrt{2}$  to contentless  $T_{PAST}$  occurs, resulting in the lengthened vowel nucleus of  $V_2$ .  $\sqrt{2}$ 's projection thus extends to TP, which merges with  $\sqrt{1}$  under  $\sqrt{1}P$ .  $\sqrt{1}P$  merges with a contentless Asp head and Obj moves to Spec, Asp, after which AspP merges with v under vP. Head movement of  $\sqrt{1}$  to v through Asp occurs, then vP merges with a contentless  $T_{PAST}$  head. The lengthened vowel nucleus of  $V_1$  is a result of  $\sqrt{1}$  movement to contentless  $T_{PAST}$  and finally, the movement of Subj to Spec,  $T_{PAST}$  is attributed to EPP features of the contentless  $T_{PAST}$  head. This derivation is represented below.

(118)



Under this analysis, the complement of  $\sqrt{1}$  is clausal, which differs from Aboh (2009), in which AspP merges with a functional head F (which has no phonetic content at PF) to form FP, which then merges as the complement of  $\sqrt{1}$ . The existence of this TP in the extended projection of  $\sqrt{2}$  is motivated by the two different observed instantiations of T on  $V_2$  in multi-verb constructions: the lengthened vowel nucleus that surfaces as a result of verb root movement to  $T_{PAST}$  and the infinitival  $\dot{a}$ - prefix that signifies  $T_{NON-FINITE}$ <sup>23</sup>. Recall the repeated examples below.

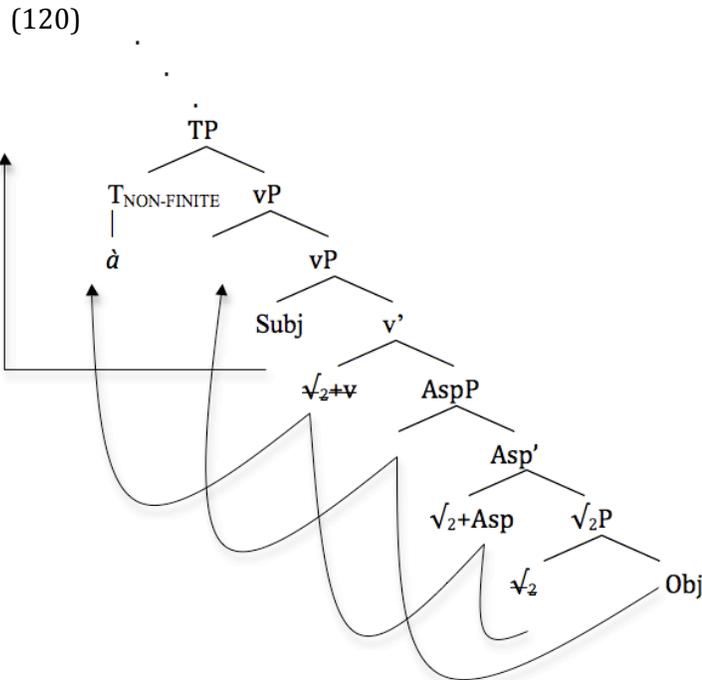
<sup>23</sup> The third possibility for T in Twi is  $T_{NON-PAST}$ , which I have thus far assumed to be contentless except in the case of the future tense, in which the  $b\epsilon$ - prefix is merged. Under the proposed analysis, we would expect to see this instantiation of  $T_{NON-PAST}$  in the subordinate clause as well, but recall from Section 3.3 that a construction like the following is disallowed.

(xxxx)	*Ama	bε-wɔ	bayerε	no	bε-di
	A	FUT-pound	yam	DET	FUT-eat

- (119) a. Ama wɔɔ bayerɛ no dii yɛ  
 A pound-PST yam DET eat-PST do  
 ‘Ama pounded the yam and ate it.’
- b. Ama bɛ-wɔ bayerɛ no a-di  
 A FUT-pound yam DET INF-eat  
 ‘Ama will pound the yam and eat it.’

Indeed, these observations seem to necessitate a T head in the projections of both verbs and it is this that results in my conclusion that multi-verb constructions in Twi are best described by positing a clausal projection for consecutive verbs as well as initial verbs

As such, this analysis is also able to account for the Twi data when  $V_2$  is marked by the infinitival marker, as in (119b), the only difference in the derivation being that no do-insertion is observed. The structure of the subordinate clause is as follows (unpronounced copies of the verb root are marked with strikethroughs):



This fact is puzzling under my analysis, but will not be discussed in detail here. Recent work on the characterization of the future marker in Twi, however, may provide some insight into this curious distribution. A fellow Swarthmore student, Leland Kusmer, characterizes what has traditionally been called the future marking prefix *bɛ-* as a motion prefix that is being/has been reanalyzed (depending on the dialect of Twi) as future tense. Based on evidence from Fante Twi, he suggests that a MotP, merged after  $\sqrt{P}$  and before AspP, generates the *bɛ-* prefix. If a lack of intervening heads permits this prefix to raise to T, the phrase receives a future reading. If an aspectual head intervenes, however, a future reading is not permitted and the motion reading prevails. The intervention of an aspectual head is observed in what is typically called the immediate future aspect, marked by the prefix *rebɛ-*. Assuming Kusmer's analysis, the immediate future prefix can be reanalyzed as two morphemes—the progressive aspect marker *re-* and the motion prefix *bɛ-*.

In relation to multi-verb constructions, assuming that the range of operations available in a subordinate clause is more restricted than those available in a main clause, the raising of *bɛ-* from its base-generated position in MotP to T—in order to receive a future reading—may be disallowed, thus explaining the lack of constructions like (xxxx).

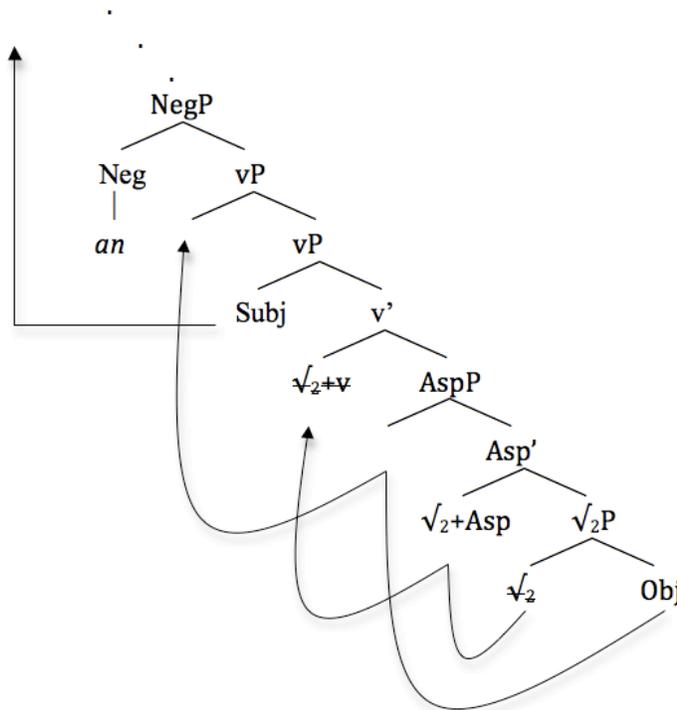
As explained in Section 4.2, do-insertion is obviated when a phonetically realized T head is present. With  $T_{\text{NON-FINITE}}$  phonetically realized as  $\dot{a}$ - in (119), the verb root is permitted to move to v, but the pronunciation of a lower copy is required due to edge constraints, thus the higher copy in v is not pronounced.

A similar situation occurs in negated multi-verb constructions.

- (121) Ama an-wɔ bayerɛ no an-di  
 A NEG.PST-pound yam DET NEG.PST-eat  
 'Ama didn't pound the yam and eat it.'

The presence of the lexically filled Neg head merged with vP allows root movement to v, but again, potential edgelessness of Asp requires pronunciation of a lower copy of the verb root.

(122)



As previously discussed, do-insertion is also obviated in cases when Asp is phonetically realized, thus a final derivation to consider is a construction in the habitual aspect.

- (123) Ama wɔ́ bayerɛ no dí  
 A pound yam DET eat  
 'Ama pounds the yam and eats it.'

Recall that manifestation of habitual aspect in (123) is a phonetically null prefix spelled out as a floating High tone, thus  $\sqrt{2}P$  merges with a contentless Asp head. The EPP features of this contentless Asp necessitate object movement, but no do-insertion is required due to the pronunciation of  $\sqrt{2}$  in Asp, substantiating the High tone aspect marking upon Spell-Out. The rest of the derivation proceeds as expected.

I thus conclude from this section that the Twi data is best represented by an analysis of serialization in which all verbs project to the TP level, despite the traditional stipulation that serializing structures contain only one clause. An account in which  $V_1$  is functional—assigning its complement no thematic role—explains the presence of only one overt object and movement of this object derives the  $V_1$ -OBJ- $V_2$  surface order evident in multi-verb constructions. By appealing to Kandybowicz's (2010) characterization of do-insertion in Twi, the presence/absence of  $y\mathcal{E}$  following  $V_2$  in constructions with inanimate objects is explained by the same phono-syntactic constraints apparent in mono-clausal structures. It remains to be seen why an overt pronoun appears after  $V_2$  in multi-verb constructions in which the object is animate—an issue discussed in the following section.

#### 4.4: Resumptive Pronouns

Recall that multi-verb construction in which the object is animate require the presence of an overt pronoun following  $V_2$ .

- (124) Kofi kyii akɔla no bɔɔ \*(no)  
 K catch-PST child DET beat-PST 3<sup>rd</sup>.SG  
 'Kofi caught the child and beat it.'

I conclude that these constructions are structurally similar to those in which an overt pronoun does not appear after  $V_2$  based on similarities observed in Section 3, especially identical extraction facts between the two types of constructions. Having concluded in favor of an Aboh-style (2009) analysis, I now show that, despite the presence of an overt pronoun in some multi-verb constructions, the analysis proposed in the previous is able to account for sentences with animate objects—the requirement that the edge of a Spell-Out domain in Twi be pronounced explains this obligatory overt pronoun.

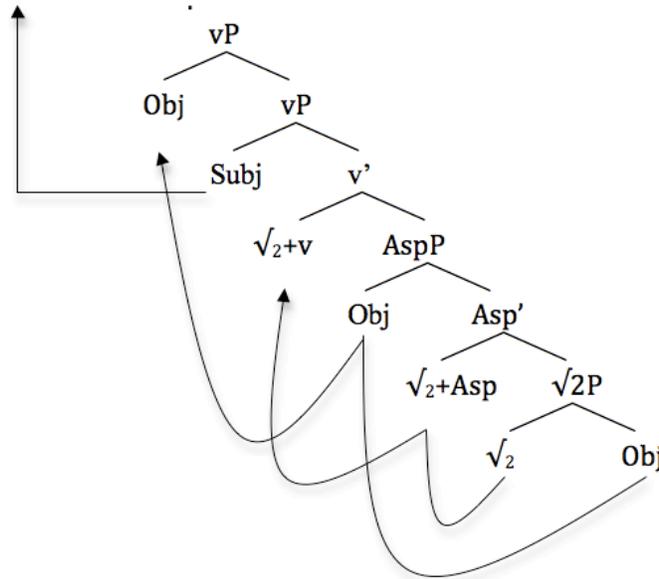
Initially, the structure in (118) seems unable to account for an overt pronoun after  $V_2$  because it necessitates that only one syntactic object is generated—functional  $V_1$  does not require an object as a thematic role. However, there is evidence that the overt pronoun after  $V_2$  is resumptive, thus that it is simply a pronounced copy of the object that has moved to linearly follow  $V_1$ .

- (125) \*Kofi kyii akɔla no bɔɔ wɔn  
 K catch-PST child DET beat-PST 3<sup>rd</sup>.PL  
 'Kofi caught the child and beat them.'

- (126) \*Kofi kyii en-kɔla no bɔɔ no  
 K catch-PST PL-child DET beat-PST 3<sup>rd</sup>.SG  
 'Kofi caught the children and beat her/him/it.'

As these examples demonstrate, the structure disallows mismatch in number between the object of  $V_1$  and the object of  $V_2$ , which I take to signify that the overt pronoun following consecutive verbs in multi-verb constructions with animate objects is a resumptive pronoun, thus that it is simply a pronounced morphologically impoverished copy of the object. As such, assuming that the derivation of (124) requires movement of the verb root to T (the consequence of which is the lengthened verb nucleus present on  $V_2$ ), copies of  $\sqrt{2}$  are left behind in the head of Asp and  $\sqrt{2}$ 's base-generated position under  $\sqrt{2}P$ . Object movement also leaves behind a copy of the object in Spec, AspP, as shown below.

(127)



Assuming Nunes-style (1999) considerations relating to linearization of chains, these lower copies would be deleted upon Spell-Out; however, phono-syntactic constraints stipulate that if all of these additional copies are deleted, AspP will be edgeless and the derivation will therefore crash at PF (Kandybowicz 2010). In this case, though, pronunciation of a morphologically impoverished copy of the object is able to prevent a crash at PF because animate object pronouns have an overt realization in Twi. Recalling that Spec, Asp is an edge, pronouncing that the copy of the object in Spec, Asp satisfies edge conditions; only necessitating that one edge position be filled, edge constraints thus do not require do-insertion.

Consider also the derivation of (128) in which a lexically realized  $T_{\text{NON-FINITE}}$  head is present.

- (128) Kofi re-kyi akɔla no a-bɔ no  
 K PROG-catch child DET INF-beat 3<sup>rd</sup>.SG  
 'Kofi is catching the child and beating it.'

Verb root and object movement proceed as expected, with the verb root able to raise to  $v$  and the object moving to the edge of the  $vP$  domain to prevent freezing. Upon Spell-Out of AspP, the derivation again faces a situation in which copies of  $\sqrt{2}$  remain in the head of AspP and in  $\sqrt{2}$ 's base-generated position while a copy of Obj remains in Spec, Asp. In order to prevent edge violations, a copy of either the verb root or the object must be pronounced. Recall from Section 4.2 that  $v$  does not require morphophonological support and thus it would be possible to satisfy edge conditions by pronouncing a lower copy of the verb root rather than a higher copy in  $v$  (Kandybowicz 2010). However, it is more desirable for the derivation to pronounce the object copy in order to allow the verb root copy to be pronounced at  $v$ , which results in the appearance of a resumptive pronoun. As we saw in cases where the object is inanimate, but  $T$  is contentful (cf. 119a), the derivation also must choose between pronouncing a lower copy of either the verb root or the object; however,

when the object is inanimate, pronunciation of a morphologically impoverished object copy also leads to a crash at PF because inanimate objects in Twi have no phonetic content.

As such, phono-syntactic constraints explain the difference in realization of overt object pronouns in multi-verb constructions in Twi; when an object is animate, a derivation in which an impoverished object copy is pronounced, rather than the verb root copy, is preferred. If, however, the object is inanimate, pronunciation of an impoverished copy will not satisfy edge constraints, therefore, do-insertion is required. The analysis proposed in Section 4.3, then, is able to account for the two types of multi-verb constructions discussed in this thesis.

#### Section 4.5: Adverbial Modification

A final consideration for the proposed analysis is the observed distribution and scope of adverbials. This section provides a brief discussion of the adverbial modification patterns observed in Section 3.5 in relation to the proposed structure of serialization. Recall that adverbs following  $V_1$  lead to an interpretation in which only the event denoted by  $V_1$  is modified, whereas adverbs following  $V_2$  lead to ambiguity—either the event denoted by both  $V_1$  and  $V_2$  are modified or only the event denoted by  $V_2$  is modified. Examples illustrating this are repeated below.

- (129) a. Ama wɔɔ bayerɛ no dii yɛ ntɛm  
 A pound-PST yam DET eat-PST do quick  
 ‘Ama pounded the yam and ate it quickly,’ (such that either only the eating was quick or both the pounding and the eating were quick).
- b. Ama wɔɔ bayerɛ no dii yɛ  
 A pound-PST yam DET eat-PST do  
 ɛnura  
 yesterday  
 ‘Ama pounded the yam and ate it yesterday,’ (such that either only the eating occurred yesterday or both the pounding and the eating occurred yesterday).

These facts present no difficulties for the proposed account. In the case of (129b), two possible places of adjunction explain the ambiguous readings: if adjunction to the higher AspP occurs, the reading is such that the events denoted by both verbs are modified; if adjunction to the lower AspP occurs, the reading is such that only the event denoted by  $V_2$  is modified. In (129a), extraposition of the subordinate TP explains the individual modification of the event denoted by  $V_1$ , but this massive rightward movement of TP will not be discussed here. The adverbial modification facts observed are thus expected under my analysis<sup>24</sup>.

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<sup>24</sup> Though the proposed analysis of multi-verb constructions in Twi accounts for modification of each verb individually, further investigation of sentence-final adverbials leads to some unexpected results based on the necessity of a phonetically realized edge in a spell-out phrase (Kandybowicz 2010). These unexpected facts are presented below, but the issue remains unresolved. What is necessary to my analysis is that individual modification of each verb is available and that the following facts do not invalidate this conclusion.

Three possible variations of the second verb phrase are available under adverbial modification. In the first, the adverb appears following the verb +  $yɛ$ , as exemplified in the repeated

example below. (The scope of the adverbial's modification will be discussed after all examples are presented.)

(xxxvi)	Ama	wɔɔ	bayerɛ	no	dii	yɛ	ntɛm
	A	pound-PST	yam	DET	eat-PST	do	quick

Considering that do-insertion is obviated by the presence of an overt object (or pronoun), this variation is only available when the object is inanimate and therefore null.

(xxxvii)	*Kofi	kyii	akɔla	no	bɔɔ	yɛ	ntɛm
	K	catch-PST	child	DET	beat-PST	do	quickly

In the second variation, the adverb directly follows the verb—no do-insertion is observed.

(xxxviii)	Ama	wɔɔ	bayerɛ	no	dii		ntɛm
	A	pound-PST	yam	DET	eat-PST		quickly

This variant is not surprising considering that Kandybowicz (2010) observes that manner and temporal adverbs obviate do-insertion in Twi. Again, this variant is only available when the object is inanimate.

(xxxix)	*Kofi	kyii	akɔla	no	bɔɔ		ntɛm
	K	catch-PST	child	DET	beat-PST		quickly

In the final variation, the adverb appears following the verb + object pronoun.

(xxxx)	a.	Kofi	kyii	akɔla	no	bɔɔ	no	ntɛm
		K	catch-PST	child	DET	beat-PST	3 <sup>rd</sup> .SG	quickly
	b.	Ama	wɔɔ	bayerɛ	no	dii	no	ntɛm
		A	pound-PST	yam	DET	eat-PST	3 <sup>rd</sup> .SG	quickly

Note that this variant is possible when the object is animate or inanimate, though the use of an overt pronoun to express an inanimate object is disallowed when no adverb is present.

(xxxxi)	*Ama	wɔɔ	bayerɛ	no	dii		no
	A	pound-PST	yam	DET	eat-PST		3 <sup>rd</sup> .SG

These three possibilities are interesting because they suggest different scopes of modification. Based on what do-insertion tells us about clausal architecture in Twi, the scope of the adverb in (xxxvi), (xxxviii), and (xxxx) should be predictable. Since *yɛ* is a last resort repair strategy for edge constraints, the presence of *yɛ* in (xxxvi) indicates that there is otherwise no phonetically realized edge of the AspP. Though an adverb is present, the fact that it is not obviating do-insertion suggests that it is merged higher than AspP and that it should therefore modify the events denoted by both verbs. According to my speakers, however, this variation also allows a reading in which only *V*<sub>2</sub> is modified. In (xxxviii), the absence of *yɛ* indicates that do-insertion is obviated by the adverb and thus that the adverb is an adjunct to the lower AspP, which suggests a reading in which only the event denoted by *V*<sub>2</sub> is modified. My speakers, however, also permit a reading in which both *V*<sub>1</sub> and *V*<sub>2</sub> are modified. In (xxxx), the presence of an overt pronoun should not disallow either reading and this ambiguity is indeed attested by my speakers.

It is important to note that some of these judgments are unexpected and that more investigation into adverbial modification is needed to determine the precise semantic interpretations of adverbs appearing in these three environments. One possible explanation is that the judgments were too fine-grained for my speakers; indeed they struggled to explain the scope of these adverbs.

#### Section 4.6: Summary and Unresolved Issues

To summarize Section 4, I have shown that Twi multi-verb constructions are best explained by an analysis that does not rely on covert coordination and is instead characterized by serialization. A highly articulated extended projection of  $V_2$  is required due to the observed lengthened vowel nucleus of  $V_2$  in the simple past that is indicative of V to T raising. This TP projection is further motivated by an analysis in which the  $\dot{a}$ - prefix observed on  $V_2$  is an infinitival marker, which is generated in T. As such,  $V_2$  and its extended projection merge with  $V_1$ , which, based on Aboh (2009), is analyzed as a lexical verb.  $V_2$  thus introduces both the internal and external arguments and object movement derives the surface word order of  $V_1$ -OBJ- $V_2$ .

Appealing to recent work on do-insertion in Twi (Kandybowicz 2010), this analysis is also able to account for the appearance of an overt pronoun following  $V_2$  in cases in which the object is animate, though the presence of this overt pronoun initially seems puzzling due to the proposal that only one syntactic object exists in Twi multi-verb constructions. We have also seen that observed negation marking of both  $V_1$  and  $V_2$  as well as adverbial modification are explained by the extended projection of each verb.

However, further questions remain, such as why a construction in the simple past or habitual disallows the presence of the infinitival marker on  $V_2$  if such a marker is acceptable in all other tenses/aspects. Additionally, examples of multi-verb constructions in which phonetically realized aspect prefixes appear on  $V_2$  are unattested (recall that such constructions were deemed covertly coordinated in Section 3.3 due to extraction facts), despite the presence of an AspP in each verb's projection. Similarly, it is unclear why this structure requires uniformity in tense/aspect/polarity—conceptually possible combinations of these features are not always grammatical and even so, those combinations that are allowed are analyzed as covertly coordinating based on extraction facts. Thus missing from this thesis is a characterization of the semantic relationship between long-distance heads that stipulates this uniformity; an investigation into this relationship could perhaps elucidate the aforementioned issues.

Nonetheless, this analysis makes several important contributions to the literature on Twi and to the discussion of multi-verb constructions cross-linguistically. The following section provides a conclusion by highlighting these contributions.

#### 5: Concluding Remarks

This thesis discusses the descriptive characteristics and structural derivation of multi-verb constructions in Twi, concluding that Twi exhibits covert coordination as well as non-coordinate structures. I characterized the non-coordinate structures as cases in which the extended projection of the consecutive verb is the complement to the initial verb, an analysis compatible with Aboh's (2009) characterization of serialization. That coordinate island constraints are not observed in some multi-verb constructions in Twi substantiates my claim that such constructions are non-coordinating, but the presence of instantiations of T on  $V_2$  in these constructions explains my argument in favor of a clausal projection for consecutive verbs—though positing multiple clauses departs from the traditional constraint that SVCs are mono-clausal. My analysis differs from previous literature on Akan as well, by providing systematic differentiation between coordinate and non-coordinate structures through extraction facts and by explaining apparent 'object sharing' through means other than positing null pronouns.

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The important fact remains, however, that each verb in a multi-verb construction can be individually modified.

To mediate the apparent ‘object sharing’, I rely on the assumption that  $V_1$  is functional and  $V_2$  is lexical, introducing internal and external arguments which move to derive the SUBJ- $V_1$ -OBJ- $V_2$  surface word order (Aboh 2009). An analysis in which movement of one syntactic object derives the final surface word order also supports recent work on the requirement in Twi that the edge of a Spell-Out domain be pronounced (Kandybowicz 2010). In cases in which the object is animate, a morphologically impoverished copy is pronounced in order to fulfill this edge condition, explaining the fact that Twi multi-verb constructions with animate objects show a resumptive pronoun after  $V_2$ .

A functional approach to  $V_1$  also has implications for other types of multi-verb constructions observed in Twi, though these types are not discussed in this thesis. Consider, for example, the ‘take-type’ construction in which  $V_1$  cannot license an internal argument on its own.

(130) Kofi di aburo no kɔɔ draso  
 K take corn DET go-PST market  
 ‘Kofi took the corn to the market.’

(131) \*Kofi di aburo no  
 K take corn DET

It is likely that an analysis like that proposed here would also account for this type of multi-verb construction, and perhaps others as well, an issue I hope to return to in future work.

In closing, I point out an interesting implication this analysis has on the study of SVCs cross-linguistically. Recall from Section 1 that a unified typological description and structural definition of SVCs is lacking, though many accounts have been proposed. A unified structural account is desirable when considering that cross-linguistic constructions that have been called serializing exhibit remarkably similar characteristics—multiple verbs lack an overt coordinator, consecutive verbs appear to be missing arguments, and all verbs manifest uniformity in tense/aspect/polarity. Assuming that such constructions can be accounted for by a unified account, an analysis such as Aboh’s (2009) is appealing due to its ability to explain the variance in tense/aspect/polarity marking on verbs in cross-linguistic SVCs. Though little work has been done on languages in which tense/aspect is marked on more than one verb in SVCs, such cases are purportedly attested by Bradshaw (1993) for Numbami and are shown in this thesis for Twi. Assuming, then, that a definition of serialization is a functional verb taking as its complement a lexical verb and its extended projection, observed differences in tense/aspect/polarity marking on verbs in SVCs cross-linguistically could be attributed to parametric differences specifying the nature of the consecutive verb’s extended projection. As such, Twi, for example, allows consecutive verbs to project to TP, whereas a language like Gungbe only allows a projection to AspP (cf. (4)).

Indeed, an account in which only the final verb in an SVC is lexical is a somewhat radical proposal for several reasons. First, it departs from the traditional characterization of SVCs by broadening the definition to include cases in which multiple verbs in a construction have clausal projections. Furthermore, such an account relies on the assumption that it is possible to account for multi-verb constructions similar to those observed in Twi and Gungbe with a functional  $V_1$  – lexical  $V_2$  approach, an assumption that will be substantiated only by much more cross-linguistic analysis of SVCs. Finally, as Aboh (2009) points out, an analysis like this relies on the assumption that fully lexical verbs and their functional counterparts are morphologically identical in serializing languages, which is an unexplained phenomenon. However, even considering these significant issues, I am

reluctant to conclude that Twi multi-verb constructions be characterized as non-serializing due simply to the observed tense/aspect/polarity marking on  $V_2$ . The fact that Twi constructions exhibit many traditional features of SVCs motivates an account of serialization. Furthermore, the analysis I propose here is modeled after Aboh's analysis of serialization in Gungbe, differing only in the extent to which consecutive verbs project. I suspect, thus, that despite the lack of reported SVCs in which multiple verbs are marked for tense/aspect, it is likely that there are cases in which serialization has been ruled out due to the presence of these markings on  $V_2$ . A consequence of this broader definition of serialization, then, is that constructions exhibiting tense/aspect/polarity marking unexplained under traditional definitions of SVCs should be closely analyzed before they are categorized as non-serializing. As such, I conclude that the TP subordination observed in Twi multi-verb constructions is compatible with an analysis of serialization. I further put forward the possibility that the analysis offered here is compatible with SVCs in other languages.

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