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Decomposing the Instrumental Construction:  
Verbal shells and argument structure in Twi

A thesis submitted in partial satisfaction of the  
requirements for the degree Master of Arts  
in Linguistics

by

Cansada Melinda Martin

2014



## ABSTRACT OF THE THESIS

Decomposing the Instrumental Construction:  
Verbal shells and argument structure in Twi

by

Cansada Melinda Martin

Master of Arts in Linguistics

University of California, Los Angeles, 2014

Professor Hilda Koopman, Chair

This thesis introduces and analyzes the instrumental construction in Twi, a member of the Kwa subgroup of the Niger Congo language family. I analyze novel data from native speakers and show that the instrumental construction presents two interesting puzzles. First, the morpheme associated with instrumentals, *de*, appears not only in instrumental constructions, but also in a particular type of indirect causative (akin to ‘let’ or ‘enable’ in English). We will see that this is an example of the cross-linguistically attested causative/applicative syncretism and can be accounted for based on properties of the verbal shell. In particular, whether or not the lexical verb necessarily projects a volitional agent determines whether a causative reading is available. The *de* construction also presents intriguing syntactic properties which turn out to be syntactic reflections of the decompositional nature of the

verbal shell. Projections within verbal shells behave as syntactic constituents and undergo internal merge, deriving an unexpected constituent. The remnant movement I argue for to explain the Twi data correlates with previously unexplained properties of the language, including the presence of resumptive pronouns under subject A-bar movement. This thesis thus contributes both theoretically and empirically to our cross-linguistic understanding of the decomposition of verbal shells and the causative/applicative syncretism by providing and analyzing data from a language in which these two phenomena have not been previously investigated.

The thesis of Cansada Melinda Martin is approved.

Anoop Mahajan

Timothy Stowell

Hilda Koopman, Committee Chair

University of California, Los Angeles

2014

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# 1 Introduction

In this thesis, I propose an analysis of the instrumental construction in Twi, a member of the Kwa subgroup of the Niger Congo language family. This thesis appeals to three levels of linguistic inquiry. At a broad level, instrumental constructions in Twi bring a variety of puzzles, an analysis of which relies on a syntactically decompositional approach to verbal shells and raises theoretical questions related to the mapping of syntactic structure to thematic roles and locality. At a micro-level, exploration of the instrumental construction brings to light properties of Twi that are not well documented or understood; my account offers an explanation for some of these Twi-specific properties and contributes empirically by elucidating further interesting properties. The middle ground is covered by drawing correlations between generalizations that explain the Twi data and patterns attested cross-linguistically, specifically related to the role of volition in the thematic domain and its combination with various types of predicates.

The Twi instrumental construction is initially intriguing because the morpheme which appears to introduce the instrumental argument is also present in a particular type of indirect causative. A typical example of each is given below.<sup>1</sup>

- (1) Kofi de sikan no twaa brodo no.  
Kofi DE knife DEF cut.PST bread DEF  
Kofi used the knife to cut the bread.

---

<sup>1</sup>Abbreviations used in this thesis area as follows: 1 — first person; 2 — second person; 3 — third person; ACC — accusative; ASP — aspect; AV — active voice; AGR — agreement; DE — de; COORD — coordinator; DEF — definite; DET — determiner; FOC — focus; FUT — future; GEN — genitive; HAB — habitual; IMP — imperative; INAN — inanimate; INFL — inflection; INSTR — instrument; LOC — locative; NEG — negative; NOM — nominative; OBJ — object; PST — past; PERF — perfect; PL — plural; PROG — progressive; R — root; SG — singular; SUBJ — subject; V — verb; VOL — volition.

- (2) Kofi de Ama kɔɔ Amerika.  
Kofi DE Ama go.PST America  
Kofi made it possible for Ama to go to America (e.g. made the arrangements).

We will see that this syncretism is attributed to properties of the complement of *de*, what I eventually analyze as a predicate with the semantics of ‘enable’. In instrumental constructions (1), the complement of *de* necessarily projects a volitional agent, while in causatives (2), the main predicate does not project a volitional agent. Close examination of the *de* construction elucidates further intriguing properties that turn out to be syntactic reflections of the decompositional nature of the verbal shell. Projections within verbal shells behave as syntactic constituents—the prediction of a decompositional approach—deriving an unexpected constituent and correlating with other properties of Twi.

The layout of this thesis is as follows. The empirical core is found in Section 2, where I provide an introduction to the basic properties of the construction. In Section 3, I propose a syntactic analysis of the construction. Section 4 addresses the thematic domain and interpretive properties, which align with robust cross-linguistic patterns. Section 5 concludes the thesis.

## 2 Properties

A host of interpretive and syntactic properties inform the decompositional analysis of the *de* construction; many of these properties rule out alternative accounts.

### 2.1 What *de* is not

We begin with a look at *de* itself: its distribution, meaning, and form. Ultimately, I show that *de* is best characterized as a head within the verbal shell, a predicate with the rough

semantics of ‘enable’, but the simplest way to begin understanding the properties of *de* is through a comparison with seemingly similar constructions. *De* is frequently glossed as ‘take’ due to structural parallels with instrumentals in other Kwa languages (e.g. Sebba 1987, Campbell 1989, Aboh 2009). These constructions as a group are commonly referred to as instrumental serial verb constructions.

GUNGBE (Aboh 2009, p.3)

- (3)    sètù zé    kpò ló    xò kójó.  
           setu take stick DET hit kojo  
           Setu took the stick hit Kojo (i.e., he hit him with the stick)

EWE (Collins 1997, p. 466)

- (4)    kofi a    tsɔ    ati-ε    fo    yao  
           kofi FUT take stick-DET hit yao  
           Kofi will take the stick and hit Yao.

It is tempting to conclude that *de* constructions in Twi are consecutive serializations of the sort exemplified in (3) and (4); serialization is a common syntactic pattern in Twi as well. Indeed, there is a serial construction which is seemingly analogous to the instrumental *de* construction.

- (5)    a.    Kofi faa            sikan no    twaa    brodo no.  
           Kofi take.PST knife DEF cut.PST bread DEF  
           Kofi took the knife and cut the bread.  
        b.    Kofi de sikan no    twaa    brodo no.  
           Kofi DE knife DEF cut.PST bread DEF  
           Kofi used the knife to cut the bread.

However, *fa*, ‘take’, and *de* have a number of different distributional properties indicating that *de* is not fully verbal.

### 2.1.1

First of all, *de*, unlike *fa*, cannot be used outside of the serial construction with the same semantics.

- (6) Kofi faa/\*de sikan no.  
Kofi take.PST sikan DEF  
Kofi took/used the knife.

I take this to show that *de* is not a lexical verb like *fa*.

### 2.1.2

A second difference in distribution is the fact that all verbs in Twi serializations of the *fa* type must be inflected, but *de* is never inflected; the lexical verb in a *de* construction always bears the inflection. In the following paradigm, (a) and (b) exhibit the *de* facts while (c) shows the *fa* pattern. We begin with past tense, which is spelled out as a lengthened final vowel on the verb.

PAST

- (7) a. \*ɛnora Kofi dee sikan no twa brodo no.  
yesterday Kofi DE.PST knife DEF cut bread DEF
- b. ɛnora Kofi de(\*e) sikan no twaa brodo no.  
yesterday Kofi DE.PST knife DEF cut.PST bread DEF  
Yesterday, Kofi used the knife to cut the bread.
- c. ɛnora Kofi fa\*(a) sikan no twaa brodo no.  
yesterday Kofi take.PST knife DEF cut.PST bread DEF  
Yesterday, Kofi took the knife and cut the bread.

The (a) example shows that spelling out past tense on *de* alone (and not on the main verb) results in ungrammaticality; (b) shows that spelling out past tense on both *de* and the main verb is also ungrammatical. Compare this to the (c) example, a serialization, in which both

verbs bear the lengthened vowel. The only grammatical possibility in a *de* construction, then, is for the main verb alone to be inflected (b).

Future morphology, which precedes the verb, is also unacceptable on *de* in any configuration. The *fa* facts are, again, not analogous; future precedes *fa* and what I call an inflectional agreement morpheme appears on the second verb.<sup>2</sup>

#### FUTURE

- (8) a. \*Ama bɛ-de sikan no (a-)twa brodo no.  
 Ama FUT-DE knife DEF AGR.INFL-cut bread DEF
- b. Ama (\*bɛ-)de sikan no bɛ-twa brodo no.  
 Ama FUT-DE knife DEF FUT-cut bread DEF  
 Ama will use the knife to cut the bread.
- c. Ama \*(bɛ)-fa sikan no a-twa brodo no.  
 Ama FUT-take knife DEF AGR.INFL-cut bread DEF  
 Ama will take the knife and cut the bread.

Progressive and perfect aspect also precede the verb and exhibit identical behavior.

#### PROGRESSIVE

- (9) a. \*Sei siara, Ama re-de Kofi (a-)kɔ Disneyland.  
 right.now Ama PROG-DE Kofi AGR.INFL-go Disneyland
- b. Sei siara, Ama (\*re-)de Kofi re-kɔ Disneyland.  
 right.now Ama PROG-DE Kofi PROG-go Disneyland  
 Right now, Ama is sending Kofi to Disneyland.
- c. Sei siara, Ama \*(re)-fa Kofi a-kɔ Disneyland.  
 right.now Ama PROG-take Kofi AGR.INFL-go Disneyland.  
 Right now, Ama is picking up Kofi and going to Disneyland.

---

<sup>2</sup>The fact that in some inflectional paradigms of serial constructions the morphology is identical on each verb (e.g. past), but in others, consecutive verbs are preceded by an *a* rather than the expected form of the inflection is a puzzle in its own right. Importantly, the two verbs must be interpreted as having the same tense or aspect, which leads me to call the second verb's morphology agreement. For detailed discussion of inflection in Twi, see Paster (2010).

## PERFECT

- (10) a. \*Ama a-de Kofi (a-)kɔ Disneyland.  
Ama PERF-DE Kofi AGR.INFL-go Disneyland
- b. Ama (\*a-)de Kofi a-kɔ Disneyland.  
Ama (PERF-)DE Kofi PERF-go Disneyland  
Ama has sent Kofi to Disneyland.
- c. Ama \*(a-)fa Kofi a-kɔ Disneyland.  
Ama PERF-take Kofi AGR.INFL-go Disneyland.  
Ama has picked up Kofi and gone to Disneyland.

### 2.1.3

A related, but seemingly more puzzling difference between the two is revealed when we consider the construction in the imperative. An imperative *de* construction is simply not possible; the *fa* alternative is the only way to express this meaning. In Twi, imperative is indicated by a low tone on the verb; in a serial type construction, both verbs surface with this low tone.

- (11) \*Dè/fà sikan no twà brodo no.  
DE.IMP/take.IMP knife DEF cut.IMP bread DEF  
Use the knife to cut the bread!

In combination, these data represent a crucial difference between the two types of sentences; *fa* exhibits expected verbal morphology, but *de* does not.

### 2.1.4

A further way in which *de* does not behave like its counterpart in the consecutive series is that it does not denote an individual sub-event within the larger event denoted by the full sentence. This is highlighted by the behavior of manner adverbs, which always follow the VP in Twi. In a consecutive series, manner adverbs may appear in two places — following

the first VP or following the second VP.

- (12) Kofi faa sikan no ntɛm ntɛm twaa brodo no brɛw.  
Kofi take.PST knife DEF quickly cut.PST bread DEF slowly  
Kofi picked up the knife quickly and cut the bread slowly.

In this example, the ‘picking up of the knife’ event is distinct from the ‘cutting of the bread’ event. No such separation of events is possible in the *de* cases, wherein manner adverbs may only appear sentence-finally.

- (13) a. Kofi de sikan no twaa brodo no ntɛm ntɛm.  
Kofi DE knife DEF cut.PST bread DEF quickly.  
Kofi used the knife to cut the bread quickly.  
b. Kofi de sikan no (\*brɛw) twaa brodo no.  
Kofi DE knife DEF slowly cut.PST bread DEF.

There is no way to express (12) using the *de* construction.

### 2.1.5

Finally, there are additional contexts in which *de* can be used, but *fa* cannot; this seems to be attributed to the lexical properties of *fa*, which requires something to be physically picked up. The following instrumental has no parallel *fa* construction. (Habitual aspect is indicated by a bare verb stem.)

- (14) Ama de/#fa nsuo noa ɛmo.  
Ama DE/take.HAB water cook.HAB rice  
Ama uses water to cook rice.

Furthermore, *de* can be used in causative-like constructions, a fact, which, as far as I know, has not before been noticed.

- (15) Kofi *de*/#*faa* Ama kɔɔ Amerika.  
 Kofi DE/take.PST Ama go.PST America.  
 Kofi sent Ama to America (e.g. made the arrangements).

The *de* causative is felicitous even if the speaker neither has any type of contact with Ama nor travels to America, which is not a possible reading of the *fa* alternative. Clearly, the meaning contribution of *de* cannot be the same as that of ‘take’. An alternate possibility, ‘use’, must be abandoned also due to causative-type constructions like that above. The precise meaning contribution of *de* is discussed in Section 4; for the time being, I continue to use a loose translation of *de* as ‘use’ in instrumentals.

The properties introduced in this section are summarized in Table 1.

Table 1: *de* vs. ‘take’ (*fa*)

	<i>de</i>	<i>fa</i>
precedes lexical verb	✓	✓
independent usage as ‘take’	✗	✓
supports inflection	✗	✓
imperative	✗	✓
independent modification (manner adverb)	✗	✓

In Section 3, I account for these differences by positing that *de* merges within the verbal shell, but does not have categorically verbal features, whereas I assume that the *fa* construction consists of more structure. At present, we turn to a more detailed investigation of the *de* construction, beginning with its interpretive properties.

## 2.2 Complements of *de*

We have seen two possible semantic interpretations of *de* constructions: instrumental and causative. These interpretations are predictable based on the type of predicate which appears



as the main verb. Here I examine three types of predicates—transitives, unergatives, and unaccusatives—and show that only the last of the three allows a causative interpretation.

We have already seen that transitive verbs in combination with *de* result in instrumentals (1). Crucially, a causative interpretation is unavailable with transitive verbs, even when the argument following *de* is a potential agent of the event denoted by the transitive verb.

- (16) #Kofi de Ama tɔɔ        εdan.  
 Kofi DE Ama buy.PST car  
 a. \*Kofi made it possible for Ama to buy a car.  
 b. ✓ Kofi used Ama to buy a car.

- (17) #Kofi de Ama kuu        no.  
 Kofi DE Ama kill.PST 3.SG.ACC  
 a. \*Kofi made it possible for Ama to kill him/her.  
 b. ✓ Kofi used Ama to kill him/her.

These sentences are semantically odd; the only possible interpretation is one in which the argument following *de* is an instrument. Thus we conclude that transitive verbs combining with *de* only yield instrumental constructions.

Unergative verbs behave identically, also forcing an instrumental reading. (Subject pronouns appear as weak pronouns.)

- (18) a. Me-de ahoma no hurii        yε.  
 1.SG-DE rope    DEF jump.PST do  
 I used the rope to jump.<sup>3</sup>  
 b. #Me-de Kofi hurii yε.  
 1.SG-DE rope DEF jump.PST do  
 # I made it possible for Kofi to jump.

---

<sup>3</sup>I gloss *yε* as ‘do’ following Kandybowicz (2013), who analyzes *yε* as a form of phonosyntactically conditioned do-support which appears in the simple past tense when no object is present.

Unaccusative verbs, on the other hand, allow both an instrumental and a causative reading, exhibited respectively below.

- (19) Ama de awiamhyen koo Amerika.  
Ama DE airplane go.PST America  
Ama used an airplane to get to America.

- (20) Me-de Kofi baa Amerika.  
1.SG-DE Kofi come.PST Amerika.  
I brought Kofi to America.

The causative differs significantly from the instrumental in that it does not require the subject to be thematically related to the main verb.<sup>4</sup> This causative is robustly available with unaccusative verbs.

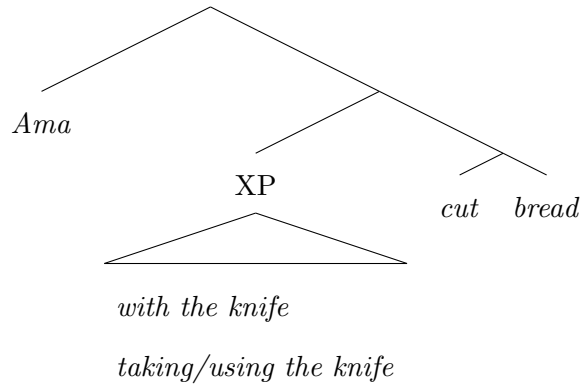
- (21) a. Yaw tenaa akonnwa no mu.  
Yaw sit.PST chair DEF LOC  
Yaw sat in the chair.
- b. Yaw de abofra no tenaa akonnwa no mu.  
Yaw DE child DEF sit.PST chair DEF LOC  
Yaw sat the baby in the chair.

The possibility of a causative interpretation is crucial in determining the structure of the *de* construction. Considering only the instrumental case, a semantically logical possibility is that *de* and the instrument are contained within either a PP or clausal adjunct.

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<sup>4</sup>Throughout this paper, I consistently refer to the surface subject as “subject”. Unless explicitly noted, I do not use this term to convey a particular thematic role or base-generated syntactic position.

(22)



Attempting a schema like that above for the causative-like construction is not possible due to the fact that the argument following *de* (which corresponds with *knife* in the diagram above) must be the theme of the main verb. Thus, an adjunct analysis of *de* leaves certain of its interpretive properties unexplained.

Table 2 summarizes the properties of the *de* construction and various predicates.

Table 2: Complements of *de*

<i>transitive/unergative</i>	instrumental	✓
	causative	✗
<i>unaccusative</i>	instrumental	✓
	causative	✓

In Section 4, I discuss how these interpretive properties are accounted for by the properties of each of these types of predicates; the transitive and unergative verbs which appear in instrumental construction must project a volitional agent, while volition is not a requirement for the arguments introduced by unaccusatives. At present, we turn to the syntactic position of the arguments themselves.

## 2.3 C-command

Evidence from the binding relations exhibited between arguments in a *de* construction indicates that the linear order of arguments reflects their *c*-command relations.

To begin with, the subject *c*-commands both the intermediate argument (an umbrella term used for the instrument in the instrumental construction and the theme in the causative construction) and the direct object. This is demonstrated through Principle A (23) and pronominal binding (24).

- (23) Kofi de ne ho kɔɔ Disneyland.  
Kofi DE 3.SG.GEN self go.PST Disneyland  
Kofi sent himself to Disneyland (i.e. made the arrangements).

- (24) Akɔlaa biara de ne sika tɔɔ kaa.  
child every DE 3.SG.GEN money buy.PST car  
Every child<sub>i</sub> used his/her<sub>i</sub> money to buy a car.

We expect neither of these binding relations between the subject and the intermediate argument to hold unless the former *c*-commands the latter.

Principle C also elucidates this fact; in (25) below, a subject pronoun cannot co-refer with an R-expression in the intermediate argument position, which is expected if the subject *c*-commands the R-expression.

- (25) ɔ-de Kofi kɔɔ Disneyland.  
3.SG.NOM-DE Kofi go.PST Disneyland  
He<sub>i</sub> sent Kofi<sub>j</sub> to Disneyland. (\*Kofi sent himself to Disneyland.)

C-command between the subject and the direct object is evidenced in the following example.

- (26) Yaw de sikan no twaa ne ho.  
Yaw DE knife DEF cut.PST 3.SG.GEN self  
Yaw used the knife to cut himself.

The fact that the direct object, a reflexive pronoun, is bound by the subject is predicted by Principle A only if the subject c-commands the direct object (within a restrictive domain).

Both pronominal binding and Principle A also establish that the intermediate argument c-commands following arguments.

(27) Kofi de akɔlaa biara kɔɔ ne maame hɔ  
 Kofi DE child every go.PST 3.SG.GEN mother LOC  
 Kofi sent every child<sub>i</sub> to his/her<sub>i</sub> mother.

(28) Me-de akokɔ baa biara kyee ne barima.  
 1.SG-DE chicken female every catch.PST 3.SG.GEN male  
 I used every female chicken<sub>i</sub> to catch its<sub>i</sub> mate.

In (27) and (28) above, the fact that the quantifier phrase binds the pronoun contained in the lower argument is indicative of c-command. In the following sentence, the intermediate argument *Ama* binds a lower reflexive pronoun, again, a fact expected under c-command (Principle A).

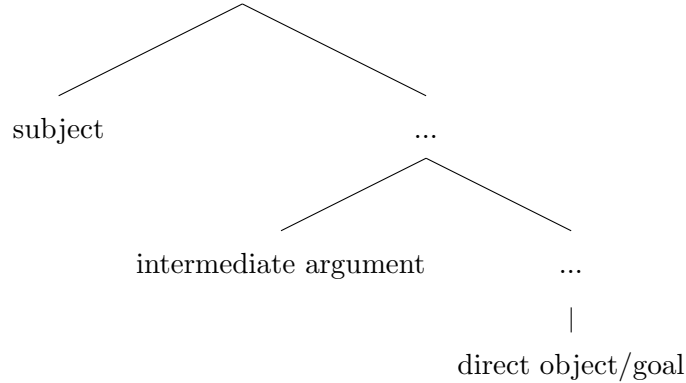
(29) Me-de Ama baa ne ho so.  
 1.SG-DE Ama come.PST 3.SG.GEN self LOC  
 I brought Ama to know herself (lit: I brought Ama to herself).

In sum, the combination of these c-command facts, summarized in Table 3, suggests a schema like that in (30) below.

Table 3: C-command

subject	<b>c-commands</b>	intermediate argument	✓
	...	direct object	✓
instrument	...	direct object	✓
theme ( <i>causative</i> )	...	goal	✓

(30)



I propose that these c-command relations hold at an early point in the derivation of the *de* construction, despite the fact that we see seemingly contradictory evidence in the following section.

## 2.4 Constituency

Constituency tests further elucidate the structure of a *de* construction. *De* and the intermediate argument do not behave as a constituent, but the string composed of the subject, *de* and the intermediate argument does.

### 2.4.1

We first look at *de* and the intermediate argument. To begin with, it is impossible to coordinate this potential constituent. Twi makes use of a clausal coordinator, *ɛna*, a DP/NP coordinator *ne*, and a null TP/AspP coordinator. None of these three strategies allow coordination of *de* and the intermediate argument in either the instrumental or the causative.

- (31) a. \*Kwame **de** **Kofi**  $\emptyset$ /*ne*/*ɛna* **de** **Ama** kɔɔ    Disneyland.  
Kwame DE Kofi COORD DE Ama go.PST Disneyland  
Intended: Kwame sent Kofi and sent Ama to Disneyland.

- (32) a. \*Kofi **de sikan no**  $\emptyset$ /ne/εna **de fork no** twaa brodo no.  
 Kofi DE knife DEF COORD DE fork DEF cut.PST bread DEF  
 Intended: Kofi used the knife and used the fork to cut the bread.

Further evidence that the relevant string does not form a constituent is that it is not possible to cleft *de* and the intermediate argument. Twi exhibits a focus-cleft construction, using the same focus marker *na* which appears in wh-clefts. The focused constituent appears sentence-initially, followed by *na*, suggestive of movement to a left peripheral position. This is true of all types of clefts, demonstrated below for DPs and verbs.

- (33) a. Bayerε no na Kofi dii ye.  
 yam DEF FOC Kofi eat.PST do  
 Kofi ate the YAM.
- b. Bɔ na Kofi bɔɔ Ama.  
 hit FOC Kofi hit.PST Ama  
 Kofi HIT Ama.

In our case, it is not possible to cleft *de* and the intermediate argument.<sup>5</sup>

- (34) a. \*De sikan no na Kofi twaa brodo no.  
 DE knife DEF FOC Kofi cut.PST bread DEF
- b. \*Sikan no de na Kofi twaa brodo no.  
 knife DEF DE FOC Kofi cut.PST bread DEF

Finally, fragment answers to wh-questions fail to identify the relevant string as a constituent. Wh-questions in Twi are formed via cleft or in-situ constructions. In cleft wh-

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<sup>5</sup>It is, however, necessary to cleft canonical adpositional elements with NPs/DPs in Twi.

- (i) a. Akua nuaa εmo no wɔ agyaade hɔ.  
 Akua cook.PST rice DEF be kitchen LOC  
 Akua cooked rice in the kitchen.
- b. Agyaade hɔ na Akua nuaa εmo no.  
 kitchen LOC FOC Akua cook.PST rice DEF  
 Akua cooked the rice in the the KITCHEN.

questions, the *wh*-word appears in a left-peripheral position preceding the focus marker *na*. The following questions do not allow the requested response.<sup>6</sup>

(35) Dɛn na ɔ-de twaa brodo no?  
 what FOC 3.SG.NOM-DE cut.PST bread DEF  
 What did she/he use to cut the bread?

(36) Sɛn na ɔ-twaa brodo no?  
 how FOC 3.SG.NOM-cut.PST bread DEF  
 How did she/he cut the bread?

(37) a. ɔ-de sikan no (twaa yɛ)  
 3.SG.NOM-DE knife DEF cut.PST do  
 She/he used a knife (to cut it).  
 b. \*De sikan no  
 DE knife DEF

These data are thus suggestive that *de* and the following argument do not form a constituent of the type that can be *a*-bar-moved, coordinated, or appear as a fragment, which is consistent with ruling out an adjunct analysis for *de*.

## 2.4.2

Several of these constituency tests, however, produce puzzling facts. The string formed by the subject, *de*, and the intermediate argument can be coordinated.<sup>7</sup>

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<sup>6</sup>It is unclear what the appropriate question is when attempting to elicit a response of *de knife*, but asking whether a string like *de sikan* can ever be used alone did not yield an affirmative answer.

<sup>7</sup>One might suggest that this is actually an instance of Right Node Raising (RNR) rather than coordination. As far as I am aware, there is no evidence that the language exhibits properties associated with rightward movement. Heavy NP shift, RNR (aside from examples like (38)), PP extraposition, and rightward scrambling have not been observed in Twi. For example, adverbs always appear VP-finally.

(i) a. Kofi (\*ntɛm ntɛm) twaa (\*ntɛm ntɛm) brodo no (ntɛm ntɛm) .  
 Kofi cut.PST bread DEF quickly  
 Kofi cut the bread quickly.



- (38) Kofi de sikan no ɛna Ama de fork no twaa brodo no.  
 Kofi DE knife DEF COORD Ama DE fork DEF cut.PST bread DEF  
 Kofi used the knife and Ama used the fork to cut the bread.
- (39) Me-de Kofi ɛna Ama de Kwame kɔɔ Disneyland.  
 1.SG-DE Kofi COORD Ama DE Kwame go.PST Disneyland  
 I sent Kofi and Ama sent Kwame to Disneyland.

I take this to indicate constituency at some point in the derivation. Crucially, it is not possible to coordinate this string using the DP/NP coordinator, indicating that it does not simply compose a complex DP (i.e. a DP containing the subject and perhaps a comitative argument) merged as the external argument to the main predicate.

- (40) \*Kofi de sikan no nɛ Ama de fork no twaa brodo no.  
 Kofi DE knife DEF COORD Ama DE fork DEF cut.PST bread DEF  
 Intended: Kofi used the knife and Ama used the fork to cut the bread.

Additional evidence that this string behaves as a constituent comes from the fact that it may appear before the focus marker *na*.

- (41) Kofi de sikan no na ɛ-twaa brodo no.  
 Kofi DE knife DEF FOC 1.SG.INAN-cut.PST bread DEF  
 Kofi used THE KNIFE to cut the bread.

If only a single constituent can precede *na*, this diagnoses the subject, *de*, and the instrument as a constituent.

Evidence from the previous section indicated that the intermediate argument is introduced by a head on the clausal spine, which seems to contradict the present coordination data. This apparent contradiction is ultimately explained by movement, as we expect. This

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This is highly suggestive that processes associated with rightward movement type constructions are not available in Twi.

string is not a base-merged constituent, but part of a moved remnant, a component of the analysis discussed in detail in Section 3. The facts, summarized in Table 4, thus fall out from movements that disrupt the base-merged hierarchy

Table 4: Constituency

<i>coordination</i>	[ <i>de</i> instrument/theme]	✗
	[subject <i>de</i> instrument/theme]	✓
<i>fragment answers</i>	[ <i>de</i> instrument/theme]	✗
<i>focus cleft</i>	[ <i>de</i> instrument/theme]	✗
	[subject <i>de</i> instrument/theme]	✓

## 2.5 A-bar movement

Movement facts are structurally informative in that they reveal a pattern correlated with other constituency facts. Additionally, predicate cleft facts provide more evidence that *de* does not behave categorically verb-like.

To begin with, consider movement patterns of subjects and direct objects in Twi. Extraction of subjects requires a resumptive pronoun in subject position, as exhibited in the following question.

- (42) Hwan na \*(ɔ-)twaa brodo no?  
 who FOC 3.SG.NOM-cut.PST bread DEF  
 Who cut the bread?

- (43) Hwan na \*(ɔ)-de sikan no twaa brodo no?  
 who FOC 3.SG.NOM-DE knife DEF cut.PST bread DEF  
 Who used the knife to cut the bread?

Direct object extraction, on the other hand, does not exhibit this requirement.

- (44) Hwan na Yaw hu?  
 who FOC Yaw see.HAB  
 Who does Yaw see?
- (45) Hwan na Kofi de sikan no twa?  
 who FOC Kofi DE knife DEF cut.HAB  
 Who does Kofi use the knife to cut?

These facts, as of yet unexplained, show that there may not be a gap where canonical subjects appear in Twi.

The natural question is whether the intermediate argument patterns with subjects or objects. In an instrumental construction, at first blush, the instrument appears to be able to undergo wh-movement.

- (46) Den na Kofi de twaa brodo no?  
 what FOC Kofi DE cut.PST bread DEF  
 What did Kofi use to cut the bread?

However, inanimate third person accusative pronouns in Twi are null, which can be seen in the following example.

- (47) Kofi bε-bɔ.  
 Kofi FUT-hit  
 Kofi will hit it.

Thus, (46) does not effectively inform the query, that is, whether or not there is a covert resumptive pronoun present. In a causative, on the other hand, an animate intermediate argument may not be extracted without the presence of a resumptive pronoun.

- (48) Hwan na Kofi de \*(no) kɔɔ Amerika?  
 who FOC Kofi DE 3.SG.ACC go.PST America  
 Who did Kofi send to America?

From this, I conclude that extraction of the intermediate argument patterns with subject

extraction. In Section 3, I motivate an analysis in which this is explained by the fact that both of these arguments are contained within an island, which correlates with constituency patterns exhibited in the previous section.

For the moment, though, consider a final movement fact. Twi allows predicate cleft as a contrastive focus strategy, involving movement of an uninflected verb root to a focus position in the left periphery, while an inflected copy remains in the canonical V position. In a *de* construction, the main verb may be predicate clefted whereas *de* may not be.

(49) Twa na me-de sikan no twaa brodo no.  
 cut FOC 1.SG-DE knife DEF cut.PST bread DEF  
 I used the knife to CUT the bread.

(50) \*De na me-de sikan no twaa brodo no.  
 DE FOC 1.SG-DE knife DEF cut.PST bread DEF

These facts are not surprising considering that *de* fails to demonstrate fully verbal properties in other ways.

Wh and a-bar movement properties are summarized in the following table.<sup>8</sup>

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<sup>8</sup>A fact related to wh and a-bar movement in Twi concerns wh-in-situ patterns in the language. Jason Kandybowicz (p.c.) suggests that a *de* construction may be analyzed as clausal embedding under a null complementizer; under this scenario, the string [‘knife cut bread’] forms a clause headed by a null complementizer and embedded under *de*, treated here as a causative verb. Kandybowicz also provides a diagnostic for embedding: Twi allows wh-in-situ objects in main clauses, but not in embedded clauses (Kandybowicz & Torrence 2013). In a *de* construction, however, both the intermediate argument as well as the direct object may appear in-situ in wh-questions without forcing an echo interpretation.

- (i) a. Kofi de den twaa brodo no?  
 Kofi DE what cut.PST bread DEF  
 What did Kofi use to cut the bread?  
 b. Kofi de sikan no twaa den?  
 Kofi DE knife DEF cut.PST what  
 What did Kofi use the knife to cut?

Following Kandybowicz and Torrence (2013), then, the in-situ facts suggest that *de* constructions are single CPs. In other words, *de* does not introduce a CP with a null complementizer.

Table 5: Wh and a-bar movement

<i>resumptive pronoun</i>	subject	✓
	intermediate argument	✓
	theme/goal	✗
<i>predicate cleft</i>	<i>de</i>	✗
	main verb	✓

## 2.6 Interim summary

We have seen a variety of descriptive properties of the *de* construction, gradually building a picture of its interpretive and syntactic properties. Decomposition of the verbal shell provides an insight into interpretation; the type of predicate with which *de* combines is responsible for the different interpretations of the construction. Various facts have also informed our understanding of hierarchical structure and constituency, elucidating syntactic configurations. Furthermore, these data provided evidence that an apparent correlation between *de* constructions and consecutive series (instrumental constructions involving the lexical verb *fa*, ‘take’, in particular) is not upheld under close examination. In addition, an adjunct analyses of *de* and the intermediate argument is not tenable.

The task at hand is to form a cohesive picture of the syntactic and interpretive properties of the constructions, which is undertaken in the following sections. We begin with the syntactic properties, then turn to the thematic structure.

## 3 Syntactic Decomposition of the *de* Construction

This section provides an analysis of the syntactic properties of the *de* construction. I show that seemingly unexpected patterns are in fact predictable in light of a decompositional

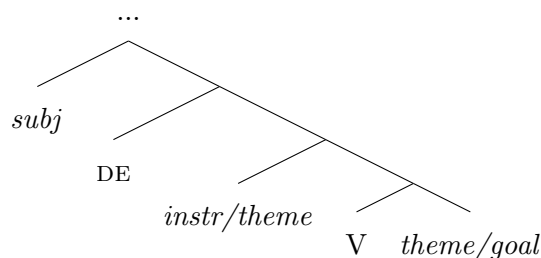
theory. In the *de* construction, not only do we have evidence for decomposition based on lexical semantics (discussed in Section 4), but I also show here that these decomposable verbal shells behave as syntactic units, which is precisely what is predicted by the theory. In other words, positing verbal shells with specific meaning contributions accounts for semantic interpretation, but doing so also makes syntactic predictions. Treating verbal shells as syntactic projections is consistent with remnants behaving as syntactic constituents. Indeed, this is exactly the case in Twi.

I first introduce the apparent contradictory syntactic properties—c-command relations and constituency. I then propose the account, discuss a number of properties that it correlates with, and make the suggestion that this account also correlates with the independent property of subject extraction in Twi. Finally, I briefly discuss inflectional properties and possible independent motivation for the type of movements necessary for the analysis.

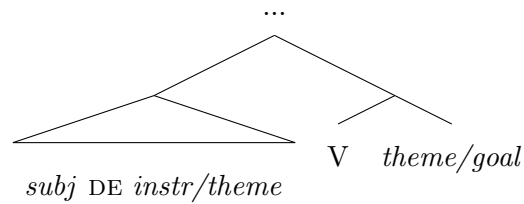
### 3.1 An unexpected constituent

At this point, syntactic properties of the *de* construction appear to be contradictory. We saw in Section (2.3) that the linear order of the argument reflects their c-command relations, but the data in Section (2.4) indicates that the subject and the instrument form a constituent to the exclusion of the verb and the object. Schematically corresponding structures are given in (51) and (52), respectively.

(51)



(52)

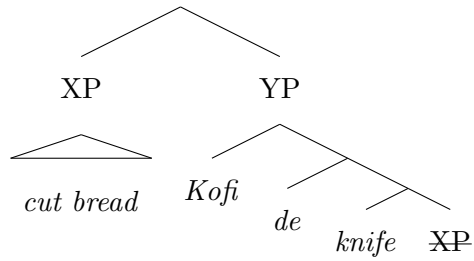


These structures are at odds with each other; it is not possible to account for both the c-command and constituency facts by looking solely at one point in the derivation. I propose, instead, that the c-command relations are checked at some point in the derivation prior to (52) and that the constituent containing the subject, *de*, and the intermediate argument is a surface constituent that is the result of movement of verbal shells; the proposal is outlined in the following section.

### 3.2 The proposal: remnant movement

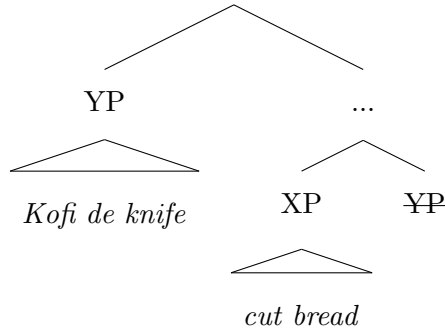
For simplicity's sake, let us assume a base-merge thematic domain like that in (51) above. It is not necessary that the base-merge structure replicates (51); however, it is crucial that at some point before the derivation is complete, the arguments stand in the c-command relations exhibited therein. We shall assume that the binding relations that support these c-command facts are checked before the building of the surface constituent commences, the building of which must minimally involve several derivational steps (assuming that sideward movement is not an analytical option). First, movement of the verb and the direct object to a position higher than the subject/agent leaves behind a constituent containing the subject, *de* and the instrument (we use an instrumental *de* construction for demonstrative purposes).

(53)



Next, movement of a shell containing this remnant results in the configuration below.

(54)



The shell containing the subject, *de*, and the instrument is thus a surface constituent, which is in accord with the ability to coordinate and focus move the material within YP (recall Section 2.4).

There is also evidence that what I have labeled as XP behaves as a constituent; XP may be elided in responses to questions.

- (55) a. Dɛn na ɔ-de twaa brodo no?  
 what FOC 3.SG.NOM-DE cut.PST bread DEF  
 What did she/he use to cut the bread?
- b. ɔ-de sikan no.  
 3.SG.NOM-DE knife DEF  
 She/he used a knife (to cut it).

Recall from Section 2.1 that *de* may not function as a predicate on its own, i.e. without a main verb. Due to this, we must assume that the response to the above question contains elided material, thereby indicating constituency of the verb and the theme.



In this way, the initially surprising constituent falls out from the decompositional theory with which we approach the verbal shells. This is simply the most economical analysis, relying only on the operation Merge, which is independently necessary. Indeed, we predict these types of constituents to be evident. If verbal shells are syntactic projections, we expect them to behave as syntactic constituents. Following from this, they are expected to be able to undergo internal merge (which has been argued by Collins (2005) and Koopman (2011, 2012), among others). Twi provides evidence for internal merge of verbal shells; there is no other way to account for both c-command and constituency facts.

I have purposefully stayed neutral regarding the constituent labels and exact landing sites for these movements. These particular questions are not specific to the *de* construction; they can only be determined once we have a better understanding of the distributional properties of these constituents. It suffices to say that the trees above are consistent with the constituency and c-command facts and that other details remain to be independently motivated as properties of Twi.

There are several pieces of evidence that are suggestive of this constituent, some of which indicate that it can be quite high in the structure and that it must, in fact, reside above T: obligatory contrastive focus, islandhood, and tense and imperative facts. First, recall the focus construction in which the subject, *de*, and the instrument appear preceding the left-peripheral focus marker *na*, which, in turn, precedes the inflected verb.

- (56) Kofi de sikan no na ε-twaa brodo no.  
 Kofi DE knife DEF FOC 1.INAN.NOM-cut.PST bread DEF  
 Kofi used the KNIFE to cut the bread.<sup>9</sup>

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<sup>9</sup>Note the inanimate pronoun appearing before the main predicate in this construction. This is reminiscent of the subject extraction facts presented in Section 2.5; extraction of subjects always results in a resumptive pronoun, which appears as a weak pronoun before the verb. However, the astute reader will notice that the forms are not identical. In a simple transitive sentence, subject extraction leaves a third person animate resumptive pronoun, *ɔ-*, whereas above, the resumptive pronoun is inanimate. One might assume that the

We have only seen *de* constructions containing definite articles thus far, but an interesting fact emerges regarding indefinite NPs, which are identifiable by their lack of a determiner; the following sentence requires a contrastive focus interpretation of the instrument, which is puzzling unless this focus interpretation results from the instrument being in a focus position.

- (57) Me-de sikan twaa brodo no.  
 1.SG-DE knife cut.PST bread DEF  
 I used a KNIFE to cut the bread (as opposed to another instrument).

The fact that the instrument receives this contrastive focus interpretation follows if the constituent I argue for is above FOC, which we assume is merged in the left periphery. If the remnant constituent moves to a position within the left periphery, it is not surprising that an indefinite instrument receives this unexpected interpretation. This obligatory contrastive focus, then, is another characteristic of Twi that is both suggestive of the type of movement argued for here and indicative that these remnants can reside in the left periphery.<sup>10</sup>

Another property of the *de* construction that is consistent with movement of this remnant is the inability to extract the subject and the intermediate argument; wh-questions of either argument require resumptive pronouns (Section 2.5). These facts are consistent with Huang's (1982) Condition on Extraction Domain effects; if an extraction domain is not properly

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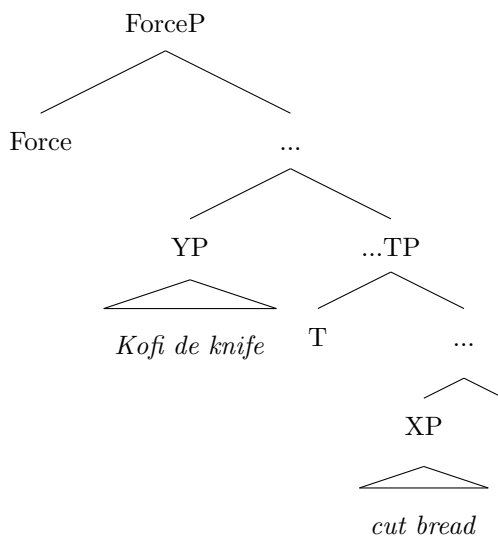
inanimate resumptive pronoun corresponds with the inanimate instrument (the knife in the present example). The resumptive pronoun is identical, however, even when the intermediate argument is animate. This is a puzzle that I leave as a direction for further research. For the moment, I contend that it is indicative of islandhood, in accord with my approach thus far. If the verb is at some point part of a constituent containing the subject and/or the instrument, this resumptive pronoun follows. A constituent of this type is not incompatible with the analysis presented here.

<sup>10</sup>Two facts related to these focus constructions remain unclear. First, we can see no immediate reason why it is only the instrument in (56) and (57) that receives the contrastive focus interpretation, as opposed to the subject, or both the instrument and the subject. It is also mysterious that there is no focus marker in (57). The precise interpretations of sentences like these require further investigation.

governed, it acts as an island. Because this remnant behaves in some sense as a complex subject, extraction of phrases from within violates subject island constraints (Ross 1967). In other words, we expect this constituent to be an island under any standard theories of islandhood. I take this to be strong supporting evidence for the constituency of this remnant.

Finally, the fact that *de* may not co-occur with the imperative (Section 2.1) is consistent with its position high in the clause. The fact that a *de* construction is not compatible with the imperative, but is compatible with other temporal and aspectual inflection (e.g. past, future, etc.) follows if the constituent I argue for here is in a position above tense and aspect heads, but below the imperative. Assuming that the imperative head is high in the left periphery, either as an instantiation of Force (Rizzi 1997, among others) or as a projection immediately below force (Koopman 2001), we can attribute the lack of imperative to some form of intervention between Force<sub>IMP</sub> and the main predicate. As we see in the configuration below, the different behaviors of the construction with respect to these inflectional heads can be correlated with the position of the *de* constituent and the position of the verb. In other words, no material intervenes between T and V, but YP intervenes between Force and V.

(58)



This position is consistent with the fact that in a *de* construction the main verb can be inflected for past tense, e.g., despite the fact that the imperative is disallowed. In this way, the imperative facts are simply another puzzle that correlates with the constituent and movements posited in this section.

Taken together, the facts and analysis presented in this section are not surprising, as we may have initially thought. We are driven to the analytical conclusion by what the language shows us empirically through constituency and c-command; data related to contrastive focus, islandhood, and the imperative provides additional evidence that the core of this analysis is correct. These facts are expected; decompositional structures are the mechanism that provides these results, though a further understanding of *why* the derivation is carried out the way it is remains to be seen.

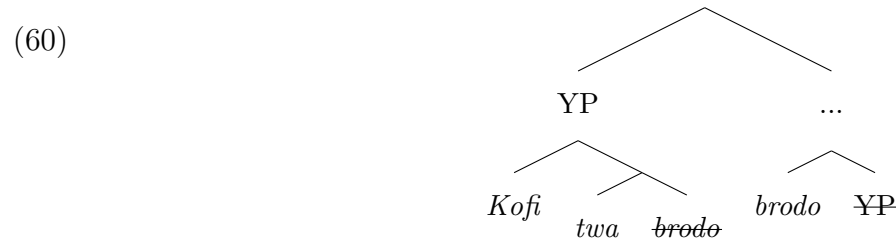
### **3.3 A correlation with subject extraction in Twi**

While providing important facts and motivation for positing the remnant movement, constructions in which this remnant is coordinated (Section 2.4) are called rare by my consultant and one might assume that Twi children learning the language hear them seldom, if ever. If the only evidence is coordination, we worry that this movement would be difficult for a child to learn. However, I suggest that subject extraction, a common syntactic pattern, is correlated with this property, pointing the child to the conclusion that this type of movement occurs.

Recall that subject extraction, but not direct object extraction requires a resumptive pronoun (Section 2.5). In the above section I provide an account for *de* construction extraction facts reliant on the subject and instrument residing within an island remnant. For the moment also assume that a canonical subject's sentence-initial position is accounted for by remnant movement of this sort. We imagine a scenario in which a constituent containing the

object moves to a position above the subject, after which, a remnant containing the subject and the verb moves to a position higher in the clause. Consider a derivation of the following sentence:

- (59) Kofi twa brodo.  
 Kofi cut.HAB bread  
 Kofi cuts bread.



The remnant YP in the tree above is consistent with the lack of subject extraction in Twi under the assumption that this remnant is also an island. Indeed there is suggestive evidence that a constituent like that exhibited in YP above is present in a canonical Twi derivation. In the following, it appears that this constituent can be coordinated.

- (61) Me-noaa εna me-dii bayerε no.  
 1.SG-cook.PST COORD 1.SG-eat.PST yam DEF  
 I cooked and ate the yam.

Coordination of this type is quite restricted and thus requires further inquiry, but I take it to be suggestive of the type of remnant movement found in the *de* constructions.

This is a seemingly surprising conclusion to make, but only in light of patterns exhibited in languages like English, in which it is clear that the verb and the object form a constituent to the exclusion of the subject. In Twi, on the other hand, there is little such evidence. VP-coordination and VP-ellipsis, both exemplary of VP constituency, are not clearly available in Twi.

First, the configuration closest to coordination in Twi is what I, and others, call seri-

alization, which has complex requirements. Simply put, it seems that the serialized VPs must be causally related. This is unexplained under a typical conception of coordination (and perhaps better explained under a clausal subordination account). For example, the following is ungrammatical in Twi.

- (62) \*Kofi faa sikan no ɛna/nɛ/∅ faa brodo no.  
 Kofi take.PST knife DEF COORD take.PST bread DEF.  
 Intended: Kofi picked up the knife and picked up the bread.

The only way to express the above is to conjoin two complete clauses, each with an overt subject. Similarly, attempts at VP-ellipsis under coordination require both a verb and a pronominal object in the second clause.

- (63) Me-twaa brodo no ɛna Kofi nso yɛɛ \*(sa).  
 1.SG-cut.PST bread DEF COORD Kofi also do.PST that  
 I cut the bread and Kofi also did that.

Lack of clear VP constituency may, in fact, be an areal feature; VP-coordination and VP-ellipsis are also unavailable in Vata and Kru (Hilda Koopman, p.c.). If this type of remnant movement is responsible for subject extraction patterns in Twi, it could be responsible for other properties of this language and others that are, as of yet, unexplained. Thus, this is a promising area for future inquiry.

### 3.4 Inflectional properties

The fact that inflectional material is only spelled out on the main verb in a *de* construction is consistent with the syntax presented above. If the remnant containing the subject, *de*, and the instrument eventually occupies a position high in the structure, nothing intervenes between inflectional heads and the main verb. However, we still wonder why *de* does not bear inflection, i.e. why it is not probed for by inflectional heads earlier in the derivation. I

attribute this fact to *de*'s lack of verbal features.

I adopt a Hale and Keyser (2002) approach to the decomposition of the VP, illustrated below for the VP ‘cut bread’.



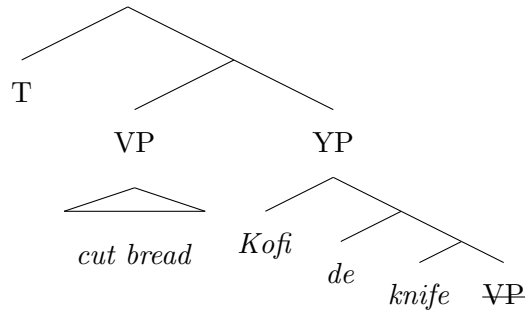
A verb root (R) combines with a “verbal host” and projects a specifier (unless it is unergative). This specifier is interpreted as the patient or theme of V. The derivation proceeds with movement of this root to the verbal host, which we can assume accounts for the “verbal” properties of verbs. I further assume that it is these features of the verbal host that inflectional heads probe for, the main predicate, bundled with this verbal host, that bears inflectional affixes. I assume that *de*, on the other hand, is not bundled with a verbal host and therefore does not have the features probed for by inflectional heads. Much like a preposition, then, *de* introduces an argument, but does not have categorically verbal features.

To account for syntactic properties of the construction, I have already argued that it is the VP, containing the lexical verb, which initially moves to a position outside of the verbal shell structure. This movement is partially motivated by the fact that inflectional heads probe for the features of the lexical verb rather than those of *de*. We must assume that inflectional heads like T cannot value the verbal feature under Agree due to locality; the VP is simply too far away, contained within a different phase. Movement results in locality between T (or other inflectional heads) and V.<sup>11</sup>

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<sup>11</sup>The specifics of how various inflectional affixes (e.g. suffixes and prefixes) are spelled out are not important to the present discussion. I simply contend that the notion of locality presented in (65) suffices. In other words, the configuration is such that we expect inflectional affixes to appear as prefixes, which is the case for future tense, e.g., but this analysis does not preclude head movement, which could be responsible

(65)



Recalling various properties of *de* from Section 2, we see that *de*'s lack of a verbal host accounts for several facts. *De* is not composed of the same pieces of structure as a lexical verb, therefore we do not expect its distribution to be the same as that of a lexical verb. Furthermore, it could be the features of the verbal host that are probed for in predicate-cleft focus constructions, accounting for the fact that *de* cannot be predicate-clefted.

### 3.5 An appeal to independent principles

I began this section with the main goal of explaining a syntactic derivation consistent with the main properties of the *de* construction, a goal which has been accomplished by the analysis and supporting data in Sections 3.2 and 3.3. The task of motivating these various movements is a separate issue, but one which I will nonetheless not ignore. One possibility is through an appeal to an arguably independent principle of grammar—Cyclic Linearization (Fox & Pesetsky 2005), which relies on the assumption that syntactic structures are built from bottom to top and that upon reaching certain points in the derivation—phases—material within that phase is spelled out. Spellout for Fox and Pesetsky (2005) is linearization, establishing ordering relations between each pair of elements within that phase. Crucially, these ordering relations cannot be contradicted at spellout of later phases.

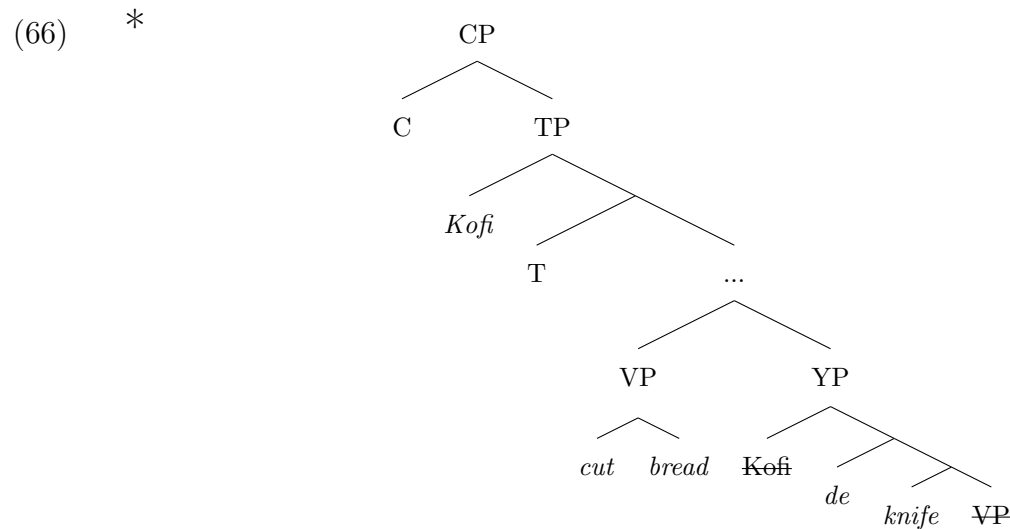
In the present case, we must assume that there is a phase boundary at the merge of the

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for the suffixal nature of the past tense morpheme.



argument which is interpreted as the agent (this means that what I have thus far labeled as YP is a phase).<sup>12</sup> At spellout of YP, the relevant ordering relations are such that the instrument precedes the verb and the direct object. After movement of the VP to a position above the subject/agent, the only way to maintain ordering relations is by movement of the contents contained within the remnant (the subject, *de*, and the instrument). Otherwise, at spellout of CP, the verb and the direct object precede *de* and the instrument.



Movement of the proposed remnant thus prevents contradiction between the sets of ordering relations across phases.

In this way, Cyclic Linearization provides a possible motivation for this remnant movement. In Section 3.3, I suggested that this remnant is moved in canonical derivations as well (i.e. without *de*), which we can think of as the grammar’s mechanism of upholding linearization requirements. If verbal shells undergo internal merge, movement of remnant material guarantees that the order of elements within a given phase will be maintained at

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<sup>12</sup>This is a reasonable assumption to make considering that the point at which the external argument is merged, or the edge of the thematic domain, is often considered a phase, as is the edge of the inflectional domain, CP (e.g. Chomsky 2000, 2001).

later phases, regardless of the presence of *de*.

### 3.6 Section summary

To summarize, we have seen that an account relying on movement of verbal shells and crucially movement of a remnant containing the subject, *de*, and the instrument is consistent with many properties of the *de* construction. The properties accounted for thus far are summarized in Table 6.

Table 6: Properties Revisited

(a)	supports inflection	<i>de</i>	✗
		<i>fa</i>	✓
(b)	independent modification	<i>de</i>	✗
		<i>fa</i>	✓
(c)	coordination	[ <i>de</i> instrument/theme]	✗
		[subject <i>de</i> instrument/theme]	✓
(d)	fragment answers	[ <i>de</i> instrument/theme]	✗
(e)	focus cleft	[ <i>de</i> instrument/theme]	✗
		[subject <i>de</i> instrument/theme]	✓
(f)	resumptive pronoun	subject	✓
		intermediate argument	✓
		theme/goal	✗
(g)	predicate cleft	<i>de</i>	✗
		main verb	✓

The difference in ability to support inflection and be independently modified exhibited between *fa* and *de* is accounted for by the different lexical properties of each predicate (a)–(b). Constituency facts are explained by remnant movement (c)–(e). The presence of a resumptive pronoun under subject and intermediate argument extraction is accounted for

Table 7: Remaining Properties

(h)	precedes lexical verb	<i>de</i>	✓
		<i>fa</i>	✓
(i)	independent usage as ‘take’	<i>de</i>	✗
		<i>fa</i>	✓
(j)	instrumental interpretation	<i>de</i> + transitive	✓
		<i>de</i> + unergative	✓
		<i>de</i> + unaccusative	✓
(k)	causative interpretation	<i>de</i> + transitive	✗
		<i>de</i> + unergative	✗
		<i>de</i> + unaccusative	✓
(l)	subject c-commands	instrument	✓
		direct object	✓
(m)	instrument c-commands	direct object	✓
(n)	theme ( <i>causative</i> ) c-commands	goal	✓

if the remnant is an island (f). Predicate cleft facts are once again attributed to properties specific to *de* and *fa* (g). What remains to be accounted for appears in Table 7.

## 4 Thematic Structure: Instrumentals and Causatives

Now that the syntactic properties of the construction have been discussed, we turn to a closer look at the semantic and interpretive properties of the *de* construction. I propose that semantic interpretation is accounted for through the combination of the volitional properties of the predicate that *de* combines with and the semantics of *de* itself, which introduces the additional argument.

I begin with a discussion of volition and show that the Twi facts can be correlated with the causative/applicative syncretism observed cross-linguistically (Comrie 1985, among others). Following this, I address the meaning contribution of *de*. I conclude with a discussion of possible structural implementations of the theory.

## 4.1 A volitional predicate

Recall the generalization observed in Section 2.2. Transitive and unergative verbs in combination with *de* yield instrumental readings of “extra” arguments while unaccusative verbs of motion allow the additional argument to be interpreted as an instrument as well as a causer. I assume that these differences stem from the crucial characteristic that separates unaccusatives and transitives/unergatives in Twi: the volitional requirements the predicates place on the arguments they select for.

In Twi, it appears that external arguments of certain transitive verbs are limited to animate, volitional NPs. An instrument, for example, cannot be the external argument of the transitives we see in *de* constructions.

- (67) \*Sikan no twaa brodo no.  
knife DEF cut.PST bread DEF  
Intended: The knife cut the bread.
- (68) \*Nsuhye re-no emo no.  
boiling.water PROG-cook rice DEF  
Intended: Boiling water is cooking the rice.

However, there is no such selectional requirement on the theme of an unaccusative.

- (69) Krataa no kɔɔ Amerika.  
letter DEF go.PST America  
The letter went to America.
- (70) Nwuma no tenaa akonnwa no mu.  
book DEF sit.PST chair DEF LLC  
The book sat in the chair.

Considering that causatives are only possible with unaccusatives, I conclude that the argument introduced by *de* can only be interpreted as a causer when the predicate with which *de* merges does not project a volitional agent. The interpretive patterns and the empirical facts

fall out from this simple generalization. First, this predicts that a predicate which necessarily projects a volitional agent cannot combine with *de* to create a causative, a prediction that we have already seen to be true; transitive verbs cannot yield causatives in combination with *de* (Section 2.2).

Second, if unaccusatives do not necessarily project volitional agents, we predict that a causative *de* construction should not demonstrate a volitionality requirement. This prediction is borne out.

- (71) Awiamhyen de krataa no koo Amerika.  
 airplane DE letter DEF go.PST America  
 The airplane got the letter to America.

In this example, an airplane, a non-volitional DP, acts as the causer. Furthermore, a nominalization may appear in subject position of a causative *de* construction, adding support to the fact that volition is not a necessary component. Consider a scenario in which Kofi has died, leaving money to Ama which allows her to move to America.

- (72) Kofi wuo no de Ama koo Amerika.  
 Kof death DEF DE Ama go.PST America  
 Kofi's death made it possible for Ama to go to America.

We have seen, then, how this generalization captures the interpretive properties of causative *de* construction and transitive/unergative instrumental *de* construction. The remaining question is how it is possible for an unaccusative predicate to merge with *de* to yield an instrumental construction, but this too is consistent with the generalization. I propose that in order for an instrumental reading to obtain, the predicate must project a volitional agent. We know that this is a requirement of some predicates (transitives), but I suggest that it is an option for others (unaccusatives). This is exhibited by the fact that unaccusative instrumentals do exhibit a volitional requirement. Consider the example below.

- (73) \*Krataa no de awiamhyɛn kɔɔ Amerika.  
 letter DEF DE airplane go.PST America  
 The letter used an airplane to get to America.

The above example is unacceptable because the letter does not fulfill the volitional requirements necessary for an instrumental construction. Further evidence of this is that the following is infelicitous if Ama is a baby, again exhibiting that volition is crucial.

- (74) Ama de awiamhyɛn kɔɔ Amerika.  
 Ama DE airplane go.PST America  
 Ama used an airplane to get to America.

These facts are unexpected if *de* is simply merging with an unaccusative predicate, even in instrumentals. I take these data to indicate that unaccusative verbs like *kɔɔ*, ‘go’, optionally project an agent.

The facts can be captured compositionally by positing the existence of a volitional predicate, which I call v-VOL. This predicate merges within the VP shell structure, adding a volitional component to the predicate denoted by the main verb. v-VOL selects for an animate/volitional argument which is merged as its specifier. The presence of v-VOL yields a complement structure that, in turn, yields an instrumental construction in combination with *de*. Without v-VOL, a causative interpretation results.

In sum, positing a volitional predicate achieves several explanatory goals. First, we attribute the two possible interpretations of an unaccusative *de* construction to structural differences rather positing two different instantiations of *de*, i.e. one which introduces a causer and one which introduces an instrument. Second, by assuming that this predicate necessarily bundles with certain transitive verbs like *twa*, ‘cut’, in Twi (i.e. it is part of the lexical specification of *twa*), the generalization that instruments—inanimate, non-volitional

objects—cannot be agents is captured.<sup>13</sup> That the corresponding English sentence (‘The knife cut the bread’) is acceptable for most English speakers may indicate the lack of volitional bundling in certain English predicates. Thus the atomic nature of V-VOL has the ability to account for cross-linguistic as well as inter-linguistic variation.

#### 4.1.1 Cross-linguistic facts

Similar syncretism is observed in unrelated languages, instantiating evidence for a predicate like V-VOL. Causatives and applicatives (frequently benefactives in particular) are introduced by the same morpheme, but the interpretation of the argument as a causer or an applied argument depends on agent-related properties of the predicate. For example, the Javanese causative *-ke* exhibits this behavior (Hilda Koopman, p.c.). Applied to roots, this suffix creates causatives.

##### JAVANESE

- (75) a. m-uteh-**ke**  
 AV-white-KE  
 make white
- b. m-birɔʔ-**ke**  
 AV-blue-KE  
 make blue

With transitive predicates, however, a pattern similar to the Twi facts emerges; the extra argument receives an applied interpretation and crucially, a causative interpretation is disallowed.

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<sup>13</sup>Much more work on the lexical semantics of Twi predicates is required in order to determine the precise requirements of V-VOL as well as the bundling properties of different types of predicates. For the purposes of the present work, it is clear that selectional properties of the predicates found in *de*-causatives differ from the selectional properties of those found in *de*-instrumentals and that these differing selectional properties can be used to form the present analysis.

- (76) Aku nulis-**ke** layang (kanggo) Putri.  
 I AV.write-KE letter (for) Putri  
 I wrote a letter on behalf of Putri; \*I made Putri write a letter.

The active voice present on the transitive verb in (76) (glossed as AV) reflects volitionality; it is this volitional component of the predicate that is correlated with the impossibility of a causative interpretation.

Analagous facts are exhibited in Hualapai, an Upland Yuman language (Ichihashi-Nakayama 1996). The applicative morpheme *-o-* introduces a benefactive argument when combined with an unergative or transitive verb while the same morpheme combines with a non-volitional “experiencer”-introducing predicate to create a causative.

#### HUALAPAI

- (77) a. Jean-ch swa:d-k-i  
 Jean-SUBJ 3.sing-3-AUX  
 Jean is singing.
- b. Jean-ch ba ma-swa:d-**o**-y-k-i  
 Jean-SUBJ PL.OBJ 3/2-sing-APPL-FUT-3-AUX  
 Jean will sing for you all.
- (78) a. Mary-ch diye:-k-yu-ny  
 Mary-SUBJ 3.be.happy-3-AUX-PAST  
 Mary was happy.
- b. nya-ch Mary diye:-**wò**-wi-ny  
 I-SUBJ Mary 1/3.be.happy-APPL-AUX-PAST  
 I made Mary happy.

This cross-linguistically robust phenomenon is generally known as the causative/applicative syncretism (Shibatani & Pardeshi 2002), observed in languages including Pima (Smith 2005), Wolof (Hilda Koopman, p.c.), Mbuun (Bostoen & Mundeke 2011) and Kinyarwanda (Kyle Jerro, p.c.). The *de* morpheme in Twi provides an additional instantiation of this phenomenon, especially interesting because this type of syncretism is previously un-



noticed in serial verb languages, e.g. Kwa languages.

## 4.2 *De*: an “enable” predicate

With the above proposal, I suggest that the roles of CAUSER and INSTRUMENT fall out from the properties of the complement of *de* (i.e. whether or not this complement contains v-VOL). In other words, *de* does not have multiple lexical entries, but rather exhibits the same meaning contribution in both the instrumental and the causative.

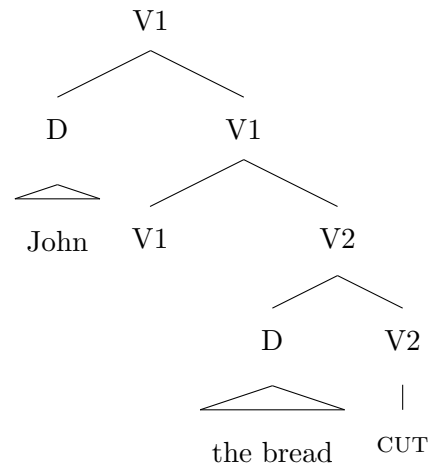
Indeed, the causer and the instrument play similar roles in relation to the predicates with which they combine—the role of the enabler. Conceptualizing instruments as enablers leads to a natural semantic interpretation; it is feasible to imagine the knife enabling Kofi’s bread-cutting. Kural’s (1996) proposal is a similar one—instruments are introduced by an indirect causative with the semantics of *let*. In an analogous way, the actions of the causer enable the event denoted by the lower predicate. There is no requirement of physical contact or force; not even psychological pressure is inferred. A common scenario in which a *de* causative is used is a case in which the enabler financially supports a trip or is responsible for transportation and other necessary arrangements in order to allow for the event to transpire. In this way, the syncretism between what I have called causatives and instrumentals is explained; the arguments can be seen to play the same role in relation to their respective predicates, but characteristics of their complements lead to the interpretive differences.

## 4.3 Structural implementation

My final goal is to propose a structural implementation of the theory introduced at the beginning of Section 4 that is consistent not only with the interpretive generalization, but also with syntactic properties of the *de* construction. In doing this, I discuss the relationship between thematic role and syntactic structure. In accord with a long line of research going

back to Baker (1988), I maintain that syntactic position strictly correlates with thematic role. In particular, we are concerned with the role of the agent, which is generated as the specifier of a verbal head that merges with the VP containing the verb and the theme. The relevant configuration is one given in the adapted tree below from Baker (1997), in line with Hale and Keyser (1993).

(79)



Regardless of what we label this agent-introducing verbal element (V1 in the structure above, V for Koopman & Sportiche (1991), *Voice* for Kratzer (1996), *v* for Chomsky (2000, 2001)), the external argument is interpreted as an agent because it is introduced in this configuration. For present purposes, “agent” is defined as a form of causer; the cause of the event denoted by the predicate is mapped to this particular syntactic position.<sup>14</sup>

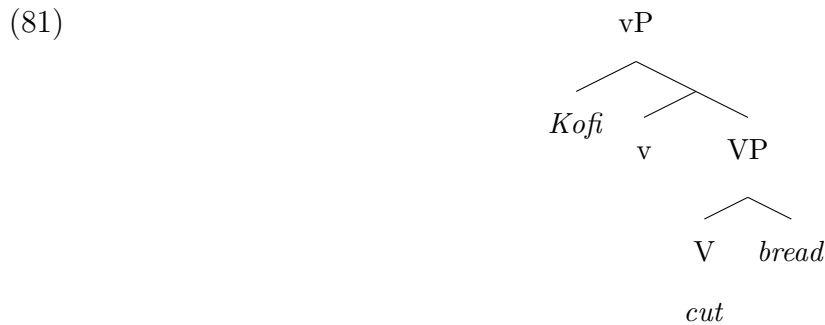
Returning to the case at hand, the instrumental construction appears to present a contradiction when compared with a simple transitive based on the same predicate.

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<sup>14</sup>As Baker (1997) points out, labeling this argument as some form of causer is more felicitous than “agent”; experiencers of verbs like *fear* are also introduced in this position, which correlates with their creation of mental representations. This creation—a form of causation—differentiates these experiencers from experiencers of verbs like *frighten*, which undergo a change of state.

- (80) a. Kofi twaa brodo no.  
 Kofi cut.PST bread DEF  
 Kofi cut the bread.
- b. Kofi de sikan no twaa brodo no.  
 Kofi DE knife DEF cut.PST bread DEF  
 Kofi used the knife to cut the bread.

The subject, Kofi, is playing the same role in relation to the bread-cutting event in both cases; the difference between the two is that there is an added enabler in (80-b). How can we maintain that the thematic relationship between *Kofi* and the VP *cut bread* is the same for these two sentences while also accounting for the presence of the instrument? The syntactic relation we wish to encode is as follows.



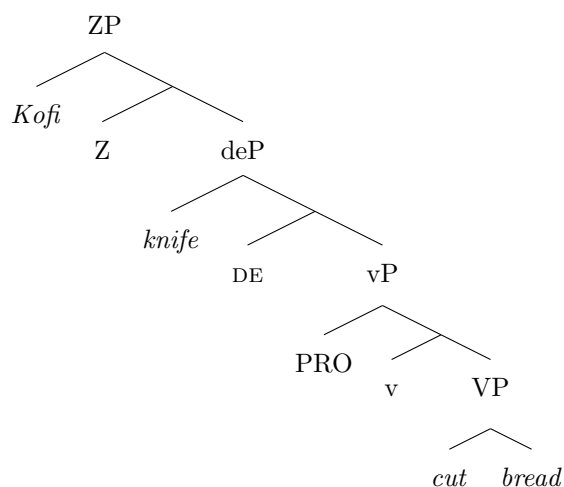
To achieve the demonstrated order while maintaining this strict mapping, I propose that the derivation begins with the formation of a simple transitive predicate; the volitional agent-introducing head is merged to VP. (For the sake of simplicity, I have condensed the external argument introducing v and v-VOL.)



In a construction in which no instrument appears, the agent is merged in the specifier position of v. In the present case, however, a PRO is merged, which is controlled by a

subject independently introduced later in the derivation, i.e. in a position higher than the instrument. The resulting structure is presented below.

(83)



PRO appears in the syntactic position mapped to the agent thematic role; if it is controlled by the higher introduced *Kofi*, we maintain strict mapping by means of control.<sup>15</sup>

There are several alternatives to the above analysis that do not make significantly different empirical predictions; I discuss them briefly here. The first is an analysis in which the agent is merged above the instrument, requiring that a strict-mapping hypothesis is abandoned. This is parallel to Pyllkaenen’s (2008) analysis of high applicatives, sketched below.

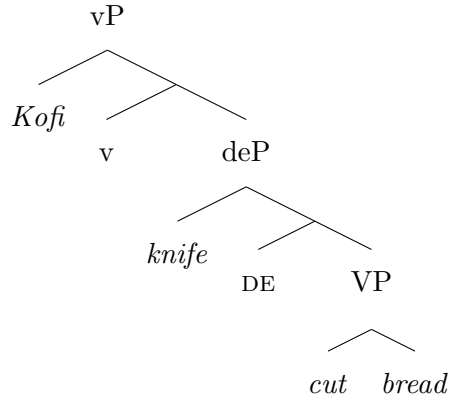
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<sup>15</sup>We must stipulate that the agent may control the lower PRO despite the apparent violation of minimality requirements—the instrument is the closest argument that c-commands PRO. The fact that the applicative argument is inanimate can be cited as the reason preventing *knife*, for example, from controlling PRO, which must be volitional. However, in the (semantically questionable) cases in which the instrument is animate, we expect the instrument, not the subject, to control PRO.

- (i) Kofi de Ama tɔɔ ɛdan.  
 Kofi DE Ama buy.PST car  
 Kofi used Ama to buy a car.

This is clearly not the case because the above is felicitous in a context in which Kofi was the purchaser of the car, but his relationship with Ama, e.g., allowed him a cheaper price. At present, I leave this an open question.

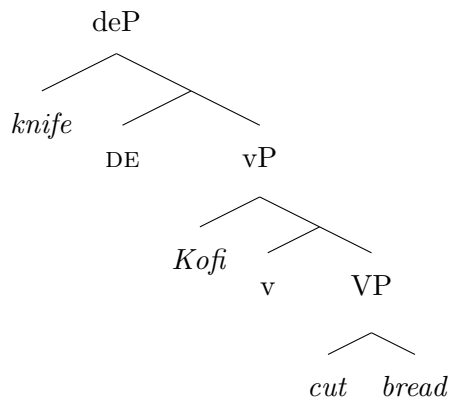
(84)



This derivation involves the same pieces of syntactic structure, results in the same c-command relations, and makes the same constituency predictions. The only difference is a theoretical one—that it must rely on a mechanism other than that encoded in syntactic configuration to lead to the interpretation of *Kofi* as the agent. Pylkkaenen (2008) invokes Kratzer’s (1996) Event Identification; the interpretation of the external argument is not dependent on its position in relation to the verb, but rather on the head which introduces it. In the structure above, *v* is replaced with Voice, the head specifically responsible for introducing the agent. The knife is not interpreted as the agent simply because it is not introduced by Voice.

A second possibility is that the instrument is merged above the agent argument.

(85)



We maintain strict-mapping, but achieving the correct order of arguments is inhibited by intervention of the instrument. To move *Kofi* to a sentence-initial position, we assume that a higher head must probe for an argument; the most local argument to this higher head is the instrument. Thus movement of the agent instead seems to violate minimality principles upheld by constraints like Attract Closest (Chomsky 1995). How, then, does the agent move around the instrument to become the subject if both the agent and the instrument are DPs? In principle, smuggling a la Collins (2005) could achieve this; phrasal movement of a constituent containing the agent results in the agent eventually appearing above the instrument (also, Kayne 2005).

Neither of these alternatives make radically different empirical predictions than the PRO analysis initially suggested; the major differences are in the theoretical approaches. Having captured the interpretive generalizations related to the *de* construction, I leave distinguishing between these accounts until further independent evidence is available.

#### 4.4 Section summary

In summary, this section has presented an analysis that is consistent with additional properties of the *de* construction. Returning to Table 7 at the beginning of Section 4, we can evaluate the remaining properties of the *de* construction. I show that a basic interpretive generalization holds; properties of *de*'s complement predict whether the construction is interpreted as an instrumental or a causative. Structurally, this generalization is captured by a volitional predicate, which necessarily bundles with certain transitive and unergative predicates in Twi (j) and optionally with certain unaccusatives (k). Cross-linguistic data supports the idea that a predicate like this plays a defining role in the causative/applicative syncretism.

Additionally, in Twi, the instrument and the causer—the extra arguments in *de* constructions—

are interpreted as enablers bearing the same relation to the predicates with which they combine regardless of the seemingly different interpretations of the constructions themselves. The fact that *de* takes a predicate as its complement is consistent with its semantics (h); *de* enables an event denoted by the main predicate. Similarly, its inability to appear independently as the verb ‘take’ (i) is attributed to its selectional properties.

The structural account I propose for the thematic domain is consistent with the fact that the linear order of elements in the *de* construction reflects the c-command relations (m)–(o); each argument is introduced by a head within the verbal shell. This account is also consistent with the theory that the agent thematic role is linked to a particular syntactic position, namely the specifier of a verbal head which takes VP as its complement (Baker 1988, 1997).

## 5 Conclusion

In this thesis, I have adopted a modular account correlating the puzzling syntactic features of the *de* construction with an independent property of language—the movement of verbal shells, a syntactic process that is predicted under our theory of verbal shell decomposition. As such, evidence that verbal shells are syntactic projections, behaving as syntactic objects and undergoing internal merge, is the main theoretical contribution. A number of independent properties of the language are suggestive of the type of remnant movement I argue for here; the empirical correlations that are consistent with the analysis I propose are evidence that the core of this thesis is correct.

We also see that different predicates in Twi exhibit different volitional requirements, another property independent of the *de* construction. Some predicates require a volitional subject, while others do not. A theory in which *de*’s interpretive properties are influenced

by the presence/absence of this volitional component in *de*'s complement makes predictions. We expect that predicates with a strict volitional component will show only one type of interpretation when combined with *de*, while predicates that do not exhibit a required volitional agent will show variation in their interpretive properties when combined with *de*, which aligns with the Twi data.

At the same time, Twi is a language that we still know relatively little about; investigation into these constructions has of course unearthed new puzzles. A detailed understanding of surface constituency in the language is one such area which could continue to refine our understanding of the movement properties of verbal shells. Additionally, having shown that lexical decomposition is responsible for interpretive properties of the *de* construction, we still wonder why components like volition exhibit varying properties cross-linguistically. Why, for example, does the predicate ‘cut’ in Twi require this volitional component while the same is not true for its English counterpart. And why do “applicative” heads combine with this type of volitional component to yield instrumentals in some languages, but benefactives in others?

Despite these further questions, the contributions of this thesis are significant. We see evidence for decomposition of verbal shells which is in line with our theory of the behavior of syntactic projections as syntactic constituents. Indeed, the remaining puzzles are a component of my empirical contributions, bringing to light properties that will undoubtedly be fruitful for further understanding of the *de* construction, Twi, and verbal shells cross-linguistically.

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