COMPOUNDING IN DANGME

BY

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DECLARATION

I, Richard Ayertey Lawer, declare that except for references to works that have been duly cited, this thesis is the result of my original research under the supervision of Dr. Clement K. I. Appah and Prof. E. Kweku Osam and that it has neither in whole nor in part been presented for another degree elsewhere.

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DEDICATION

To Jennifer Afi Segbefia, my wife, for being there for me

To Joycelynn Kathryna Dede Ayertey and Emmanuella Korkor Ayertey, my children

To Pastor Joseph Kwesi Ayertey, my father

To my siblings, Leticia Dede Okum, Charity Korkor Ayertey and Christiana Afi Ayertey

To every Ghanaian who couldn't afford university education, I dedicate this to you.

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I would like to express my profound gratitude to the Lord Almighty for seeing me through the academic ladder up to this point. Though it was tough, you have been with me; your rod and your staff, they have comforted me. I would like to acknowledge those who have helped me to come this far and to make this dream a reality. I would therefore like to thank the following people for their overwhelming support.

Dr. Clement Kwamina Insaidoo Appah, my principal supervisor. You have been more than a supervisor. Your guidance and words of encouragement go beyond this work to other aspects of my life. I really appreciate your time and patience with me. And to Prof. Emmanuel Kweku Osam, I am grateful for your effort and time in supervising this work. I wouldn't have come this far without your assistance.

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ABSTRACT

A general study of Dangme morphology has been done. However, the phenomenon of compounding has not been studied extensively as the previous studies just mentioned it as a kind of word formation process (eg., Hevi 2011; Owulah 2014). Considering the importance of compounding as a nominalisation process in Dangme, therefore, this study looked at the phenomenon to unravel the nature of compounding in Dangme and to attempt to show what they reveal about compounding in general. Data for the study was drawn from interactions with speakers of Dangme, Dangme novels and radio programmes that are broadcast in Dangme. This was supplemented by the native speaker intuition of the author. The study showed that Dangme compounds are nominals and that they may be formed from two nouns (N-N), a noun and a postposition (N-P), a noun and an adjective (N-A), a noun and a verb (N-V), a verb and a noun (V-N) and two numerals. It is shown that Dangme compounds have endocentric and exocentric subtypes and that the endocentric ones could be left-headed or right-headed. Using Construction Morphology, it is argued that the formal and semantic properties of Dangme compounds that are not traceable to their constituents are holistic properties of the constructions. It is again shown that Dangme multiplicative numerals are exocentric constructions. The phonological processes that compounding in Dangme triggers, including vowel deletion, vowel coalescence, vowel lengthening and tone lowering are discussed.

LIST OF ABBREVIATIONS

3PL	3rd Person Plural
ATM	Automatic Teller Machine
ATR	Advanced Tongue Root
CCV	Consonant Consonant Vowel
CONJ	Conjunction
CV	Consonant Vowel
CxG	Construction Grammar
CxM	Construction Morphology
DEF	Definite
Fig.	Figure
FM	Frequency Modulation
HAB	Habitual
N-A	Noun-Adjective
N-N	Noun-Noun
NP	Noun Phrase
N-P	Noun-Postposition
N-V	Noun-Verb
PERF	Perfect
POSS	Possessive
PROG	Progressive
PS	Packing Strategy
PST	Past
RHR	Right-hand Head Rule
SEM	Semantics
SUBJ	Subject
SVO	Subject Verb Object
TAM	Tense Aspect Mood
V	Vowel
V-N	Verb-Noun
WP	Word and Paradigm

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CHAPTER ONE

GENERAL INTRODUCTION

1.1 Introduction

This thesis is about compounding in Dangme, a Kwa language spoken in the south-eastern part of Ghana. The main objective is to describe the nature of compound words in the language. The present chapter is a general introduction to the study. In section 1.2, I present a general background to the study. In sections 1.3, I discuss Dangme language, its sound systems and basic phonological and syntactic information. In section 1.4, I present the problem statement, while in sections 1.5, 1.6 and 1.7, I present the objectives of the study, the research questions and the significance of the study respectively. I present the research methodology and organisation of the thesis in section 1.8 and 1.9 respectively. Section 1.10 concludes the chapter.

1.2 Background of the Study

The principal objective of a linguistic theory is to find out what it is that people know about a language they speak (Chomsky 1986). Chomsky observes that knowing a language is not simply a matter of being able to manipulate a tall list of phrases and sentences that have been stored in the mind. Rather, knowing a language involves having the ability to produce and understand a vast number of words and structures that one might never have heard or produced before.

Knowing the structure of words and their formation in a language equips speakers to form novel words in the language without violating the morphotactics of that language. In other words, knowing the morphology of a

language ensures that speakers of languages do not just produce words they have heard before but also novel ones. Morphology is the study of the study of the internal structure of words and how the various constituents of the complex words are patterned. The constituents which make up the complex words are referred to as morphemes.

A morpheme is either free or bound depending on whether it can stand on its own as a word or has to be attached to another constituent. The form *man* can stand alone and is understandable in isolation; hence it is a free morpheme. On the other hand the constituent *–ly*, which occurs in the word *manly*, making it an adjective, cannot stand alone and be understood and must always be attached to a base. Therefore, it is a bound morpheme. Morphemes, in general are used in two primary ways: to create new words (derivational) and to mark different forms of already existing words (inflectional). Thus, morphology has two main branches: derivational morphology and inflectional morphology.

In this study, my focus is on only derivational morphology, which divides into affixal derivation and compounding. Particularly, this is a study on compounding in Dangme. On the bases of the definition of a morpheme, we observe that not every component of a compound may be considered a morpheme. This is because some of the components of compounds are themselves complex structures. In view of this, the term base, a form to which another form may be attached, will be used to refer to the compound members instead of morpheme.

In pure morphological computation, it is assumed that various components (morphemes) of words contribute their individual meanings and forms to the overall meanings and forms of the words of which they are

constituents. There are instances, however, in which forms that combine to form words in languages do not actually contribute any meaning to the meaning of the words they form part of. That is to say that meaningless morphs which nonetheless combine to form meaningful words are recognised in languages. Anderson (1992: 68) hints on the deviations from the "the one-to-one relation between components of meaning and components of form which is essential to the classical morphological assumption".

Words in human languages have their internal compositions, and their components are combined in a particular acceptable manner called morphotactics (Kiparsky 1992). Nevertheless, compound words in Dangme are not just the concatenation of meaningful forms that combine their meanings to derive the meaning of the morphologically complex word. Thus, there are instances where the derived complex word shows no meaning relationship with it constituents.

This thesis intends to discover the various morphological patterns that are involved in Dangme compound formation. It aims to unravel the systematic formal and semantic relations between the constituents of Dangme compounds, and between the compounds as morphological constructions and the bases from which they are formed.

According to Aronoff (1976: 17), "the simplest goal of syntax is the enumeration of the class of possible sentences of a language, so the simplest task of morphology, the least we demand of it is the enumeration of the class of possible words of a language". This study therefore seeks to explore, among other things, the class of the possible compound words of Dangme.

A compound in Dangme may be formed from different categories but the resultant complex word is always a noun. In chapter three and four, I discuss the categories of words that combine to form compounds in Dangme. I show that the constituents of the compounds show some implicit relation and their combination requires that they have certain semantic properties.

1.3 The Genetic affiliation and speakers of Dangme

Dangme is a Kwa language of the Niger-Congo phylum that extends from the West Atlantic languages such as Wolof and Fula through Central Africa down to South Africa (Dakubu, 1987). Dangme is spoken by about 1.4 million people in Ghana, West Africa. It is spoken and taught in three out of the ten political regions in Ghana: Greater Accra, which is estimated to have the highest number of speakers, is followed by Eastern region and finally Volta region (Akortia 2014: 2).

Dangme has six dialects: Ada, Krobo, Ningo, Gbugbla, Sɛ and Osudoku (Dakubu, 1988). According to Ameka and Dakubu (2008: 215), there are some small communities, east of the Volta Region that trace their origin to Dangmeland. Most of these people have shifted to Ewe as the language of their daily life. There are also some speakers of Dangme in Nyetoe and Gatsi in Togo (Caesar 2012: 19). The language shares boarders with Akan, Ga, Ewe and Hill Guan (Ɔkere and Lɛtɛ) all of which are Kwa languages. The principal towns in which Dangme is spoken are Ada, Somanya, Odumasi, Prampram and Dodowa. The speaker of the language call themselves Dangmeli or Kloli but non-speakers refer to the language and its speakers as Krobo. Figure 1 below is the family tree of Dangme.

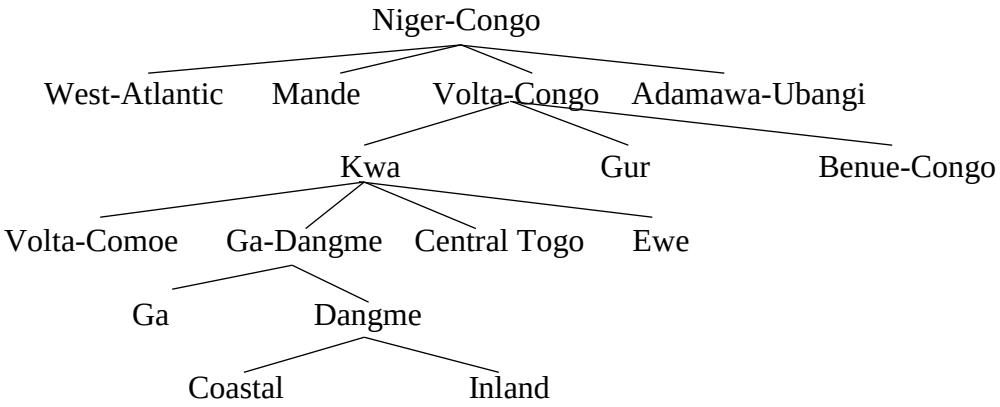


Figure 1: Family tree of Dangme

Dangme is both a medium of instruction and a subject of study at the basic level of education, especially in the principal towns where the language is used. The language is studied at the tertiary level in the Department of Ga-Dangme at the Universityof Education, Winneba. The language also features on radio and television programmes and is one of the nine government sponsored languages in the country. Figure 2 is the language map of Ghana.

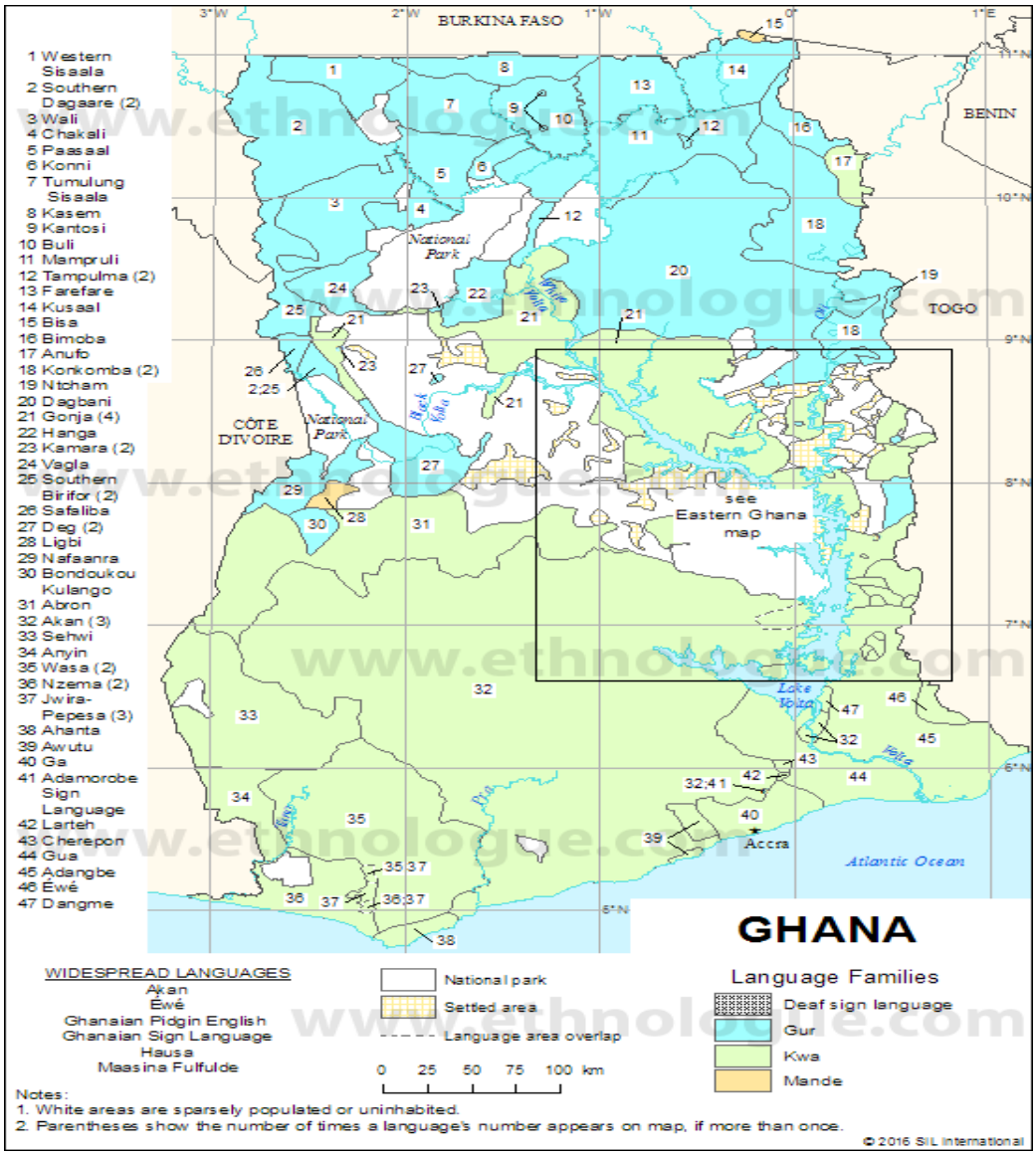


Figure 2: The language map of Ghana (Ethnologue 2016)

1.4 The structure of the Dangme language

This section looks at the structure of Dangme. I look at its sound systems and provide some basic syntactic information on the language.

1.4.1 Dangme speech sounds.

There are twelve vowel phonemes in Dangme. According to Caesar (2012: 18) Dangme has seven oral and five nasal vowels as shown in figure 3 below.

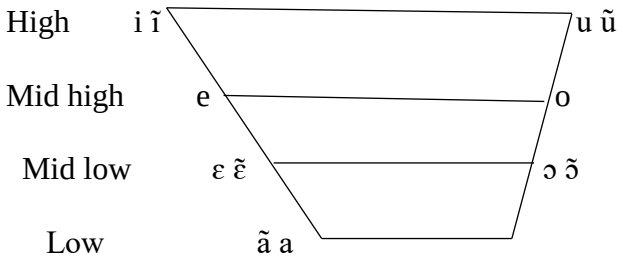


Figure 3: Figure 3: Dangme vowel chart (cf. Caesar 2012)

The oral vowels in the language, / i, e, ɛ, a, u, o, ɔ /, can be lengthened. Lengthening is indicated by doubling the vowel letters in the orthography as in /ii, ee, ɛɛ, aa, uu, oo, ɔɔ/. Table 1 illustrates Dangme oral vowels in words.

Table 1: Dangme oral vowels in words

Vowel	Word	Translation
i	bì	to erect
e	dé	say
ɛ	bɛ́	broom
a	bá	come
u	dú	to bath
o	bō	cloth
ɔ	bɔ́	dew
i:	tii	straight
e:	bèé	to pass
ɛ:	bèɛ́	to sweep
a:	pàá	to borrow
ɔ:	bɔ̀ɔ́	to create
o:	pòó	to cut
u:	bùú	calculate

The five nasal vowels, / ã, ɛ̃, ĩ, ũ,ɔ̃ / may also be lengthened. Lengthening in the language creates contrast in a minimal pair. For instance *tũ̀* ‘jumped’ and *tũ̀ũ̀* ‘very dark’. Table 2 illustrates Dangme nasal vowels in words.

Table 2: Dangme nasal vowels in words

Nasal vowel	Word	Translation
ĩ	sĩ̀	fried
ɛ̃	pɛ̃̀	untied
ũ	tũ̀	jumped
ɔ̃	dɔ̃̀	curve
ĩĩ	sĩ̀ĩ́	to fry
ɛ̃ɛ̃	pɛ̃̀ɛ̃́	to untie
ũũ	tũũ	dark
ɔ̃ɔ̃	dɔ̃̀ɔ̃́	to curve

Nasality is phonemic in Dangme. Contrast in meaning between two words as conditioned by the differences in nasality of the vowels is illustrated in (1).

1. a. tà ‘chewed’ tã̀ ‘palm ‘tree’

   b. dú ‘to bathe’ dṹ ‘to plant’

According to Dakubu (1987:13), Dangme has an inventory of twenty-two (22) consonants. The consonants are /p, b, m, t, d, f, v, s, z, n, ʧ, ʤ, gb, kp, ŋm, ɲ, k, g, ŋ, h, w, l, j /. All the consonants can occur in word initial position. Dangme is a CV syllable structure language with occasional syllabic consonant, usually the bilabial nasal / m / that occurs at word final positions as in *lámm̀* ‘act of singing’, *fiémm̀* ‘ act of playing’ (cf.. Dakubu 1987).

1.4.2 Dangme Tones

Dangme, like other Kwa languages like Akan and Ewe, is a register tone language with three level tones, which are contrastive. The three level tones in Dangme are mid [ā], low [à] and high [á]. For instance, the words in (2) below are different only in the tones that are marked on them. Tone in Dangme can

therefore be considered as having a lexical function as the contrast in tone brings about meaning variation between otherwise identical words.

2. a. mā ‘hearings’ sā ‘rot’
   b. mà ‘town’ sà ‘matress’
   c. má ‘dough’ sá ‘to grind’

Tone does not only perform lexical function in the language, but also grammatical function. This means that, depending on the kind of tone on which a particular grammatical construction is said, the tense, aspect and mood (TAM) of the construction may change. This is illustrated in (3) below.

3. a. À yà wèm̀.
   3PL.SUBJ go.PERF home
   ‘They have gone home.’
   b. Á yà wèm̀.
   3PL.SUBJ go home
   ‘They should go home.’

In (3a), the tone on the 3PL subject pronoun is low and that contrasts with the high tone on (3b). Therefore, the change from indicative mood (3a) to imperative mood (3b) is brought about by the tonal difference on the subject pronoun of the two clauses.

Tone and nasality are not marked orthographically in the language. Nevertheless, for the purposes of this study, instances where the use of a word may create lexical ambiguity, these suprasegmental features will be marked. I

also consider the mid tone as the default tone and therefore, mark only low and high tones, nevertheless, there are contexts in which mid tones are marked to help pronunciation.

1.4.3 Dangme Syllable Structure

According to Dakubu (1987), Dangme is a CV language with occasional syllabic nasals that carry low tone. This is exemplified in (4) below.

4. a. pampuro / pà.m̀.pù.ró/, [CV.C.CV.CV] 'bamboo'
   b. agbeli / à.gbè.lì/ [V.CV.CV] 'cassava'
   c. tsō poku /ʧó̩.pó.kú/ [CV.CV.CV] 'tree root'

Though Dangme words are predominantly CV in structure, occasional CCV structures do exist. In such structures, however, the clusters consist of any of the obstruents /p, b and k/ followed by the alveolar lateral /l / as illustrated in (5).

5. a. blòdò /blò.dò / [CCV. CV] 'bread'
   b. plè /plè/ [CCV] 'wing'
   c. klè /klè/ [CCV] 'big'

Dangme has V syllable and syllabic consonants in addition to CV, CCV. The V syllable always occurs at word initial position as shown in (6). Example (4a) illustrates a syllabic consonant.

6.	a.	akate	/à.kà.té /	[V.CV.CV]	‘groundnut’
	b.	apletsi	/ à.plé.ʧĭ /	[V.CV.CV]	‘goat’

1.4.4 Syntactic Features of Dangme

Dangme has a Subject-Verb-Object (SVO) basic word order in a canonical clause structure. *Àwó* and *Àwísí* in examples (7) are grammatically functioning as subjects of the verbs, whiles the object functions of the sentences (7a) & (7b) are performed by the noun phrases *àtí ɛ̄* and *kpété ɛ̄* in their respective sentences.

According to Dakubu (1987: 56), “Dangme has a verbal system where every verb phrase contains one main verb”. The independent verb bears verbal features of aspect polarity and mood (Caesar, 2012). Dangme, according to Caesar (2012: 20), does not have tense “what exists rather is the aorist which refers to a past action in the indicative mood.” Dakubu (1987: 67) explains that:

> In the Dangme verb system, tense is of secondary importance. Of course, it is perfectly possible in the language to indicate whether an event took place in the past, is taking place in the present or is to happen in the future, for example by using adverbial expression of time, like *mwɔ̀nɛ̀ɔ̀* ‘today’, *hwɔ̀ɔ̀* ‘tomorrow’. However, in the structure of the VP itself, it is not relations of tense or time sequence that are important so much as relations of the kind commonly called aspect.

Example (7) illustrates this.

7. a. Àwó nǔ̀ àtí ɛ̄ hǐ̀ɛ̃̀
Àwó catch.OARIS cat DEF yesterday
'Àwó caught the cat yesterday'

. b. Àwísí yè kpètété ɛ̄ tǎ̀
Àwísí eat.PERF oranges DEF finish
'Àwísí has finished eating the orange.'

The perfective and the past form of the verbs in (7a) and (7b) show no morphological differences. Therefore the interpretation of either kind is dependent on context or adverbial phrase of time like *hìɛ̃̀* in (7a). The verb carries aspect that is either perfective or imperfective.

The perfective aspect indicates that the action has taken place during a period of time and is complete. The imperfective aspect describes actions that are ongoing (progressive) and habitual actions or events described by the verb. According to Caesar (2012: 19), the form "*ngɛ...e* or *hii…e* is a discontinuous auxiliary verb which combines with the independent verb to mark the progressive aspect. Complements of transitive verbs are pre-posed before the verbs while *–e* is suffixed to the verbs to express the progressive in Dangme." Consider the examples in (8).

8. a. Dèdé ngɛ̄ là-é. .
Dèdé be.at sing-PROG
'Dèdé is singing.'

b. Pàpáà hìí hù-é
Pàpáà be.at farm-PROG
'Pàpáà is farming

c. Àtá ngɛ̄ ní yè-é.
Àtá be.at things eat-PROG

‘Àtá is eating food.’

d. Bàbá hìí pà gbè-é.
Bàbá be.at: river beat-PROG
‘Bàbá is fishing in the river.’ (Caesar, 2012: 20)

The verbs in examples (8a & 8b) are intransitive and they express the act of singing and farming respectively as ongoing activities. At the same time, example (8a) can also mean ‘Dèdé is into singing’ while (8b) can mean ‘Pàpáà is into farming’. Caesar (2012) observes that the interpretations of examples (8a) and (8b) involves the use of the progressive aspect to express habitual state of affairs. The verbs in examples (8c & 8d) are transitive and have their objects occurring in between the verb and the modal. Thus, the SVO word order is interrupted in clauses that indicate progressive aspect where the object of the clause intervenes between the subject and the verb. It specifically occurs between the copula verb *ngɛ̄* and the main verb. This is shown in example (9).

9. Àwísɨ́ ngɛ̄ kpɛ́té ɛ̄ yé é
Àwísɨ́ BE orange DEF. eat PROG
‘Àwísí is eating the orange’

The habitual *-ɔ* which sometimes occurs as [-i] or [-a] attaches to the verb stem. Consider the examples in (10) from Caesar (2012:20).

10. a È bá-á.
3SG come-HAB
‘He comes.’

b. È yé- ɔ́.
3SG eat-HAB
‘he eats’

c. È sɨ̀-í.
3SG fry-HAB
‘he fries’

Finally, it has been argued that Dangme has no prepositions but rather relational noun particles which occur after the head noun (cf.. Adi, 1997). These relational nouns include *se* ‘back’, *no* ‘top’, *mi* ‘inside’, and *he* ‘around’. In this study, I argue in favour of Adi (1997) to establish the claim that these words are nouns and they combine with other nouns, especially concrete ones to form nominal compounds. However, they are sometimes used as postpositions, much like Akan (cf. Osam et al 2011). In that case they combine with nouns to form noun-postposition compounds.

1.5 Problem Statement

Compounding, the formation of words by combining two words, is a very common word formation process in Kwa languages. It is also a productive word formation mechanism. For example, Appah (2013b), Akrofi-Ansah (2012) (Mbah & Mbah, 2012) and Dada (2012) have studied the phenomenon in their respective languages, Akan, Lɛtɛ, Igbo and Yoruba. Though the process as well as the product of compounding as a morphological process has received a lot of research attention in many Kwa languages, the phenomenon has, if anything at all, only been noted to occur in some languages. In other words the process and issues of compounding in certain languages have not been studied at all.

Generally, some morphological aspects of Dangme have remained, to some extent, unexamined. The effect is that morphological features of Dangme and related morpho-phonological processes are yet to be described. The extent to which the morphology of Dangme is similar to or different from other languages and how Dangme morphology augments and deepens our

knowledge of morphological operations in Kwa languages is yet to be explored in the area of word formation as a whole and compounding in particular. Hevi (2011) discussed aspects of Dangme morphology in the context of word formation. She mentioned compounding as one of the means of word formation in the language. However, her work couldn't provide extensive analysis of Dangme compounds. There is therefore the need to study the phenomenon of compounding in the language to ascertain how productive the process is in the formation of words as well as the nature of compound words and the morpho-phonological processes that occur during compounding.

1.6 Research objectives

The main objective of the thesis is to document the nature of compound words in Dangme. The work therefore aims to:

i. Identify what constitutes a compound in Dangme
ii. Classify Dangme compounds based on varying criteria, including
    a. Headedness
    b. Syntactic categories of the constituents
    c. The relations that exist between the constituents
iii. Describe the properties of the various types including phonological processes that are triggered in the process of forming compounds in Dangme.

1.7 Research questions

The thesis seeks to answer the broader question of what is the nature of Dangme compounds. Specifically, the following questions are going to be answered in the cause of the study.

i. What is a compound in Dangme?
ii. What grammatical categories of words combine to form compounds in Dangme?
iii. What relations exist between the constituents of Dangme compounds?
iv. What is the nature of headedness of Dangme compounds
v. What kind of phonological processes occur during compounding?

1.8 Signification of the work

This study will add to existing literature on Dangme. The work will supplement the discussion on word formation processes and complement works done on the phenomenon of compounding in Kwa languages. It will serve as a guide for further research on the phenomenon in the language and serves as reference material for further studies.

1.9 Research design and methodology

This study continues the investigation of the mechanisms of word formation in languages of the world and Dangme, in particular, using samples of oral data collected from free speech of native Dangme speakers. The speech from which data is drawn is sampled from electronic media programmes on Rite FM 91.1, a popular radio station at Somanya, one of the main towns where Dangme is

spoken. The programmes include advertisements of different kinds of products and discussions on various political, social, educational and cultural issues.

The radio programme selected is Rite Morning Ride (Rite 90.1 FM). It is a morning show that starts from 5:45 to 10:00 am from Monday to Friday. The show has segments that cut across diverse areas of life. The various components of the show include a motivational segment, headlines from newspapers and websites, weather report from the Ghana Meteorological Agency, sports, and a studio discussion on issues ranging from politics, business, education, farming and health. I selected this programme because the discussions are done in Dangme.

In addition to the radio station, I also attended church services at the Agormanya assembly of the Church of Pentecost International in which services, including the sermons are always conducted in Dangme. I attended funerals in some of the Dangme speaking communities to observe and record some of the activities during the funeral rites to obtain data.

Beside the above mentioned sources, I extracted data from Dangme novels and literature books that I purchased from the Bureau of Ghana Languages. The books include *Ajesiwɔ* 'they left before us' by J.M.T Dosoo (2015), *Nyɛ Ko Pee Ye Ya* 'you should not perform my funeral rite' by Gowdwin A.N. Kubi (2013*)* and *Dangme Ngmami Bɔ* 'Dangme writing system' by Bureau of Ghana Languages (1990). I read all the books and highlighted all the possible compound words I identified. The identified compounds were then typed into my database for analysis.

Lastly, data is generated through introspection and personal interaction with other native speakers. However, data that was generated through introspection was presented to other native speakers for authentication.

1.9.1 Presentation of Data

Data for this study is presented with standard transliteration. The data is presented with Dangme orthography and with their respective English glosses which help with understanding. I first present the bases with their English glosses which is then followed by the compound with its translation. Consider for example, the presentation of N-N compounds in Table 3.

Table 3: Examples of Dangme N-N compounds

Base 1	**Gloss**	**Base 2**	**Gloss**	**Compound**	**Translation**
tsō	tree	pókú	root	tsōpókú	root
àgbélì	cassava	tsō	tree	àgbélìtsō	cassava tree
wē	house	tsɛ̄	owner	wētsɛ̄	brother
blɛ̀fó	foreign	tã̀	palm tree	blɛ̀fótã̀	pineapple

In the examples, base 1 and base 2 represent the constituents of the compounds. The compound members are given in their full word forms.

It must be noted that the Dangme orthography shows little difference from the sound segments and therefore I do not transcribe the words. However, when a situation demands transcription, I provide broad phonological transcription to make the point clearer.

1.10 Organisation of the thesis

Chapter two covers literature on the phenomenon of compounding and Construction Morphology, the main framework for the study. It shows that

Construction Morphology is adequate in handling most of the complex issues of word formation. Regarding the review of current studies on the phenomenon of compounding in some Kwa languages, I deal with key issues such as headedness and syntactic categories of the compound constituents and the compound words. The literature review critically analyses the definition of word, lexeme and stem and how these have informed the definition of compounds. It also considers the typology of compounds.

To ensure that the objectives of the study are met, chapter three analyses the differences between a canonical compound and syntactic constructs. For instance, what differentiates a noun-noun compound from a noun phrase is discussed. In this chapter, I discussed noun-noun, noun-postposition and noun-adjective compounds. The structure of the constituents of these compounds and the relations holding between the compound constituents were also discussed.

Chapter four discusses the formation noun-verb and verb-noun compounds. It also analyses the syntactic categories of compounds and headedness of Dangme compounds. Following Appah (2017b), some exocentric compounds attested in the language were also covered by this chapter.

Chapter five discusses numeral compounds and some notable phonological processes that take place during the process of compounding in Dangme. Processes such as vowel deletion, vowel coalescence, vowel lengthening and tone spreading are discussed. The final chapter provides summary of findings, conclusion of the thesis and some recommendations for future studies on the phenomenon of compounding in Dangme.

1.11 Conclusion

In this chapter, I have discussed the background of the study and showed the need for the study to be conducted. The chapter also discussed the geographical distribution of the speakers and the domains of use of the language. The phonology and syntax of the language have been discussed. I showed how these will be of relevant to the current study.

The chapter also covered the problem statement of the study and further established the need for the study at this point in time. The underlying objectives of the study together with the questions that the thesis seeks answer to ensure that the objectives of the study are achieved are also captured in this chapter. Finally, the chapter covered the methodology of the study and the significance of the work to learners of the language as well as the research community.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This chapter synthesizes the literature on the main areas of concern and discusses the theoretical foundation of the study. It deals with the issues and development in the study of the phenomenon of compounding in section 2.2 and discusses Construction Morphology, the framework adopted for this study, in section 2.3. The section on issues of compounding highlights the themes that are relevant to this study, including the definition (section 2.2.1), typology (section 2.2.2), headedness (section 2.2.3) and the phonological processes that occur during compounding (section 2.2.4). Section 2.4 concludes the chapter.

2.2 Issues of compounding

Many interesting issues come up in the discussion of compounding. These issues include the definition (eg., Bauer 2006; Spencer 1991), interpretation (Scalise & Vogel 2010a), classification (Scalise & Bisetto 2009; Bauer 2010; & Appah 2017b, 2016c) and phonological processes of compounding (Akrofi-Ansah 2012; Anderson 2013; Dada 2012; Aliero 2015).

Compound words attract the attention of researchers for several reasons (Appah 2013b). They are interesting because they exhibit a type of internal syntax which is somewhat not overt (Scalise & Vogel 2010a), as can be observed in the compounds *truck driver* (driver of a truck), *blackboard* (a board that is black) and *singer writer* (a singer and writer). In *truck driver*, for instance, *truck* is the internal argument of the verb *drive* whereas *black*

modifies *board* to make it a kind of *board.* In the case of *singer writer*, none of the constituents modifies the other, but there exists a covert coordination 'and' between the constituents.

According to Scalise and Vogel (2010a: 1), compounds also "present a contact point between crucial linguistic and non-linguistic notions". These notions include (a) syntagmatic and paradigmatic relationships, (b) relationship between syntax and morphology and (c) linguistic knowledge and pragmatic knowledge.

In the compound *truck driver*, the relationship between the constituents is that of predicate-argument relation, so that we can say the verb selects its own argument that must be of a particular kind. Scalise and Vogel (2010a) note that the lexical head of a compound serves as a source of 'attraction' for elements leading to the construction of many similar other compounds. In the compound *truck driver*, we may assume that *driver* is the source of attraction for the formation of compounds such as *bus driver, taxi driver* etc.

With regard to the relations between syntax and morphology, the major issue has been the fact that compound appears as the morphological construction that is very close to syntactic constructions (Appah 2013b). Hence there is no general agreement on which component of grammar should be considered responsible for the formation of compounds (cf.. Scalise & Vogel 2010b).

Another interesting issue about compounds is their interpretation. The interpretation of compounds needs both linguistic knowledge and pragmatic information. Thus, some compounds cannot not be interpreted without recourse to pragmatic information. Scalise and Vogel (2010a) observe that to interpret

the compound *bike girl* 'a girl who left the bike in the vestibule' for instance, we do not only need linguistic information but also pragmatic, contextual information to enable us exclude other possible meanings such as 'a girl who habitually goes to work with a bike', 'a girl who loves bikes', among others.

Furthermore, compound words appear interesting for linguistic enquiry because they exhibit weak compositionality, where their meanings are not always predictable from their constituents. Considering the compound *water mill*, meanings such as 'a mill for processing water', 'a mill located by water', 'a mill which is made out of water' among others are probable. These possible meanings of *water mill*, according Scalise and Vogel (2010a), stem out of the pragmatic relationship holding between the members of the same compound family, rather than by the combinational principle of syntax holding between the compound constituents.

These issues serve as the reasons for the increased interest in the phenomenon of compounding in languages. Scalise and Vogel (2010a: 4) maintain that "compounding is a manifestation of the tendency towards multiword constructions such as idioms, collocations, binominal constructions or the so called prefabs". It is expected that compound formation fulfills a communicative strategy that is at variant intrinsically with syntactic expressions. Thus, expressions that would require complex syntactic structures to convey are carried out by means of two combined lexemes.

In what follows, I first look at some definitions of compounds and show why they have been considered weak in describing the phenomenon. In doing so I will look at the notions of morpheme, lexeme, stem, base, root, and 'word' as used to describe the compound members. I also look at some interesting

issues of compound words such as interpretation, headedness, typology of compounds and phonological processes that are evident in compounds.

2.2.1 Definition of compound

As a morphological process, compounding has been defined differently by different writers. The lack of consensus among linguists on the definition of compound stems from the data that is available to them.

According to Ndimele (1999: 71) compounding involves the process of forming words by joining two or more independent roots to form a single word. Spencer (1991: 305) describes the phenomenon as "a concatenation of words to form other words." A compound word according to Haspelmath (2002: 85), is a word that "consists of two lexemes that are joined together (called compound members)". Harley (2009: 130) describes a compound word as "consisting of two roots". Plag (2003: 135) and Lieber (2004: 47) describe a compound as a combination of two stems. Katamba and Stonham (2006:55) describe a compound as consisting of two bases. Bauer (2003:40) defines compounding as "the formation of a new lexeme by adjoining two or more lexemes". Finally, Fabb (1998: 66) characterizes a compound as "a word which consists of two or more words".

As can be seen from the various definitions, researchers are not in agreement on what constitutes a compound, and this is due to the lack of consensus on the terms to describe the compound members: Roots, stems, lexemes, bases and words have been used to refer to the compound members by different writers.

Root, according to Katamba and Stonham (2006:46), is the "irreducible core of a word with absolutely nothing attached to it." The root is considered to be the part of the complex word that is left, possibly with some level of modification in the lexeme after all affixes are stripped off. For instance, *talk* is a root that appears in the various word forms that instantiate the lexeme *TALK* such as *talking, talked* and *talk.*

Roots in general are of two kinds: free and bound roots. Ndimele (1999) seems to restrict the description of the compound members to only independent or free roots and Katamba and Stonham (2006) provide some level of motivation to consider bound roots, arguing that words that are formed from two bound roots could be considered as compounds. They intimate that there are some compound words that are formed by a combination of a bound root to a base as in the compound *cranberry.* The constituent *cran-* is a bound root since it does not exist as a free word in English language. Fabb (2001: 69) supports this assertion by explaining that bound morphemes of this kind are neither words nor affixes and that appears to have informed Ajiboye (2014: 14) to conclude that "theses morphemes have lexical rather than grammatical meanings", and therefore cannot be categorized among affixes but words.

Amiot (2005: 194) defines root 'as "a multi-stratal entity, underspecified for flexion, which is characterized by three properties: a phonological representation, a syntactic category, a semantic representation". From this definition, we can argue that bound roots cannot be considered compound members because we cannot specify their syntactic category. This view contrasts with the view of Katamba and Stonham (2006) who see bound roots in words they call "neo-classical compounds" as compound members.

On the use of "word" as a compound member, Ramat, (2005) posits that the prototypical word is characterized by the properties of cohesion (no morphological material can appear inside of it), autonomy (i.e. it may appear in isolation) and mobility (can be used in different positions in a sentence).

Katamba and Stonham (2006:55) describe the compound members as two bases while Dolphyne (1988) uses stems or reduplicated forms. The base, according to Katamba and Stonham (2006:55), is any unit whatsoever to which affixes of any kind can be added. They assert therefore that "[a] compound word contains at least two bases that are both words, or at any rate, root morphemes." Stem, as used by Dolphyne (1988), is then subsumed under base as defined by Katamba and Stonham (2006: 55).

The problem with the definition of a word appears to influence the definition of what constitute a compound, even by the same author. For instance Bauer (1998a: 404) uses the term "stems" whiles "lexemes" is used in Bauer (2005: 105). The difficulty of linguists in defining a word and for that matter the appropriate terminology for describing the components of compounds informed Bauer's (2005: 106) argument that:

> "Giving the difficulty that has been for many years in defining a word, it is not surprising that there should be difficulty with the borderline of compounding. Items which fit poorly into the category of word should also fit poorly in the category of possible compound element"

In an attempt to ameliorate the problem of defining a compound, Scalise and Vogel (2010b) posit that the items referred to as stems, roots and words must

be identified differently in different languages. They observe that, for instance, in Greek, stems are bound forms whiles in English, they are free forms. Additionally, words in some languages (eg. Mandarin Chinese) tend to be mono-morphemic whereas in languages like Swahili, they may consist of many morphemes. This therefore necessitates the need for what constitute a compound and a compound constituent in a language to be defined and described based on the morphology of the language. For instance, Bauer (2006: 719), uses "sub-word" to describe the constituents of compounds. Bauer's choice of changing the terminology for the same notion is apparently due to his exposure to data from languages belonging to different morphological types, such as Chinese, which do not show any markers that will identify a word in terms of gender and number for nouns. He concludes that the forms in which the individual sub-word units manifest in languages may be defined differently in diverse languages; "a citation form in one, a stem in another, a specific compounding form in yet a third, a word form in a fourth" (Bauer 2006: 719).

From the discussion so far, we observe that the definition of compound in most cases depends on the units that are assumed to form the compound. This, however, worsens the problem as researchers are not in agreement on the basic morphological components (lexemes, roots, bases, stems or words) that form compounds (cf.. Fábregas & Scalise 2012: 2). To deal with the problems associated with the definition of compounding, we need to take a language-specific approach to the definition of the compound constituents. This is because, as suggested by Bauer (2006) and Fábregas & Scalise (2012), the compound members appear differently in different languages. Thus, in some languages, all roots are free standing forms while there exist some bound roots

in other languages. Also, there are languages like Manderin Chinese (isolating languages), in which inflectional morphemes do not exist and therefore, per the definition of stem by Katamba and Stonham (2006), we cannot call compound members stems.

Guevara and Scalise (2009), in an attempt to define compound devoid of all the weaknesses present in the definitions of other authors, resorted to categorial terms: $[X\ r\ Y]_{Z,}$ where X, Y and z are lexical categories with 'r' representing an unexpressed grammatical relation between X and Y. This definition, as can be observed, assumes that a compound (roots, stems, lexemes or words) has a lexical category z which may be different from its constituent X or Y, or both (Scalise & Vogel 2010a).

In this thesis, a Dangme compound is defined as a lexeme that consists of two lexemes where a lexeme in this regard is a linguistic form with a specific meaning and can stand on its own in an acceptable phrase or sentence in the language.

2.2.2 Classification of Compounds.

There are diverse criteria for classifying compounds in the literature and that shows that, as there are challenges with the definition of compounds, so are there challenges with the classification of compounds. The main criteria for classifying compounds are the categories of the constituents of the compounds, the category of the resultant compound and the presence or absence of head constituents. In what follows, I discuss the categories of compounds.

2.2.2.1 Compound classes by Syntactic category of constituents

Compounds are formed by combining lexemes of the same or different categories. For instance, Akrofi-Ansah (2012) identifies noun-noun, noun-verb and noun-adjective compounds in Lɛtɛ, with noun-noun being the commonest type. She maintains that besides these three compound types, compound numerals are also found in the language. She observes further that verb-noun and adjective-noun compounds in Lɛtɛ are mostly borrowed words from Akan and, therefore, concludes that compounds with such combinations are not productive in the language. This is interesting, as Appah (2013a) argues that adjective-noun compounds don't exist in Akan.

In Akan, compounds of the types noun-noun, noun-adjective, verb-noun, noun-nerb and verb-verb have been identified (cf. Anderson 2013; Appah 2013b; Dolphyne 1988). Abakah (2006), writing on the tonology of Akan compounds, for instance, lists as many as nine different classes of compounds in the language, with all of them resulting in nominal compounds. He includes de-verbal noun-noun, phrasal verbs and nominalization as other types of compounds in the language. Appah (2013a: 74), however, argues that the "variation in number [of Akan compounds] results from the unsystematic application of criteria, leading to the separation of types that belong together".

Though most of the authors who have contributed to the discussion of compounding in Akan include adjective-noun compounds, Appah (2013a) argues that such a category does not exist and that the supposed adjectives in such combinations are rather nouns. He explains that the putative adjective stems in the compounds bear prefixes which they do not bear when they occur in isolation and therefore posits that the "prefixes nominalize the adjectives

which then must occur as left-hand nominal modifiers in noun-noun compounds which are predominantly right-headed in Akan" (Appah 2013a: 74).

In C'lela, a language spoken in Nigeria, three types of compounds, based on the categories of the constituents, have been identified: noun-noun, noun-adjective, and verb-noun, with noun-noun compounds being the commonest and most productive (Aliero 2013). It has been observed that noun-adjective compounds in C'lela obey noun-adjective ordering in attributive use; and therefore conform to the word order of the language (Aliero 2013: 36). Like Akan and Lɛtɛ, compounding in C'lela is a nominal derivation process as the word class of the resultant compound, irrespective of the categories of the constituents is always a noun, with the exception of verb-noun combination in the language which tends to produce both nominal and verbal compounds. Aliero (2013) observes that verb-noun compounds in C'lela occur in the order VO, hence conform to the SVO word order in the language.

2.2.2.2 Compound classes by headedness

The presence of a head constituent in a compound is one of the main criteria for classifying compounds in the literature. Headedness relates to whether one of the constituents of the complex word shares formal and/or semantic properties with the whole compound. The head of a morphological construction describes the dominant and privileged constituent in an asymmetrical relation which determines the properties of the whole (Appah 2016a). The prediction of the asymmetrical relation is that in a compound of two constituents, only one of them qualifies to assume the role of the head.

Andreou (2014: 12) argues that the head of a complex construction is "the most important in the structure and it dominates the whole complex word."

Studies on headedness of compounds (eg., Andreou 2014; Booij 2007; Scalise & Fábregas 2010) have shown that a compound may have different kinds of heads, represented by different constituents; but these different heads could also cluster on one constituent. Though they observe that there is evidence for the existence of heads in compounds cross-linguistically, they posit that detailed language-specific research is needed to specify the exact properties of heads.

With respect to the identification of heads in compounds, Scalise and Fábregas (2010: 110) propose that the underlined elements in the following compounds qualify as the head of their formations since"[they have] several properties which are imposed on the whole compound"

1. a. Italian. Cassa forte [box+strong], 'safebox'
   b. Spanish. Camposanto [field+holly] 'graveyard'
   c. English. Green card (Scalise & Fábregas 2010: 110)

They argue that in the compound *cassa forte*, for instance, *cassa* is the head and not *forte* since the category of the compound comes from *cassa* which is a noun and not *forte* which is an adjective as shown in (2)

2. $[cassa]_N$ $[forte]_A \rightarrow [cassa\ forte]_N$ [box+ strong] 'safe'

(Scalise & Fábregas 2010)

In example (1b), *campo* is the head of the compound because the category of the compound as a noun originates from that constituent which is also in a hyponymy relation with the compound. Thus, both the semantic and formal properties of the compound are inherited from *campo.* The same observation can be made about (1c), where *card* plays the role of head in the compound *green card.* The meaning of the compound is a type of *card* and not *green,* and the compound shares the same syntactic category with *card* and not *green.* However, whereas the head of the Spanish and Italian compounds (1a) and (1b) are the left-hand constituents, the head of the English compound, *green card,* is the right-hand member.

In recent studies of the morphology of languages, researchers have tended to argue that morphologically complex words have heads. Williams (1981: 248) proposes the right-hand head rule (RHR) by establishing that the right-hand constituents of complex words are the heads of such words. In this regard the head of the compound *seablue* is *blue* and that of *blackboard* is *board.* Again, the head of *seablue* is *blue*, the right-hand constituent, because the semantic and syntactic properties of the compound originate from *blue*. The same, however, cannot be said about *honeymoon* as the semantic properties of the compound have no direct relation with *moon,* the right-hand constituent.

Owing to this fact, Selkirk (1982: 20) argues that "the right-hand head rule (RHR) is not adequate to characterize the headedness of English word structure, if verb- particle sequences are left-headed components and if the head of an inflected word is not the inflectional affix, which in English is on the right". Owolabi (1995) in agreement with Selkirk (1982), explains that the head of Yoruba complex words is the left-hand member and that is confirmed

by Táíwò (2009) who concludes that most morphologically complex words in Yoruba have their left-hand members as heads.

Similar observation is made by Appah (2013b) on endocentric compounds in Akan. He observes that though most of the endocentric N-N compounds are right-headed, there are also left-headed ones. Thus, morphologically complex words may have head constituents which could either be the right or left members.

2.2.2.2.1 Types of head

A constituent of a compound is considered the head when it determines all the properties of the compound through the process of feature percolation (cf. Lieber 1992). The study of headedness of compounds in languages shows that different types of compound heads exist. The types of heads posited in the literature include semantic head, syntactic head, formal head and morphological head. For instance, Dressler (2006) distinguishes between semantic head, syntactic head and morphological head. He maintains, regarding the compound *pickpockets,* that there is no semantic head because the meaning of the compound is not traceable to any of its constituents. However, the constituent *pick* is the syntactic head since it is the constituent that selects *pocket* as its internal argument. He posits that the morphological head of the compound is the constituent of the compound that takes the inflectional morpheme, hence in the compound *pickpockets, pocket* is the morphological head since the plural inflection is marked on it. However, Appah (2013b: 156) argues that "the use of plural marking in this manner to distinguish between a morphological head and a syntactic head can be

misleading since the position of a plural marker may be the default pattern in a language."

A principal distinction in the classification of the head of compounds in the literature is that between semantic head and formal head (cf. Andreou 2014; Appah 2013b; Táíwò 2009). Semantic head and formal head categorisation of the head constituents of compounds is made, depending on which of the constituents of the compound shares what property with the compound. Appah (2013b) argues that, though these categorisations exist, both semantic and formal head may coincide on one constituent.

According to Scalise and Guevara (2006: 190), "the semantic head is the constituent that shares its lexical conceptual information with the whole compound". This implies that the class of elements that the compound denotes is a subset of the class of elements that the semantic head denotes. For instance, *seablue* is a type of *blue*, the head. In other words, *blue* is a natural class within which one can identify *seablue* as one of its members.

Regarding the formal head, Scalise and Guevara (2006:190) maintain that it "is the constituent of the compound that has the same formal features, including lexical categories, as the compound and has the same distributional properties with the compound". In other words, any syntactic slot that the compound can fill in a sentence, the formal head can also fill it. That is, *blue* can occur at where *seablue* can occur without a drastic change in meaning or rendering the sentence ungrammatical. However, the non-head constituent *sea* cannot occur alone where the compound can occur as shown in (3).

3 a. The man has painted his house blue

b. The man has painted his house seablue

c. *The man has painted his house sea

d. Blue shirts are very expensive.

e. Seablue shirts are very expensive

f. *Sea shirts are very expensive

Appah (2016a: 2) observes that the formal head is attributed to the constituent of the compound that shares "its sub-categorisation frame and lexical category with the entire compound so that the compound has the same [syntactic] distribution as the formal head constituent."

2.2.2.2.2 Endocentric and exocentric compounds

We may make another categorisation of compounds based on the presence or absence of a head constituent. As observed about the head of a compound, the compositional meaning of a compound like *seablue* is a type of *blue.* We can say, therefore, that the compound *seablue* has a head based on the semantic properties of the compound. On the other hand, there are compounds like *honeymoon* that do not share some or all of their semantic properties with either of their constituents. Compounds that have heads are endocentric whereas those without head constituents are exocentric (Fabb 2001).

Fábregas and Scalise (2012: 127) posit what they call categorial exocentricity to explain the compounding process whereby the categorical head of the compound is absent or cannot be attributed to any of the constituents as in the compound *man-made.* The category of the compound *man-made* as an adjective is not present in any of the constituents and therefore the compound is categorially exocentric.

On the compound *sneak-thief*, Fabb (2001: 67) explains, *thief* is the head because a *sneak-thief* is a kind of *thief* and both *thief* and *sneak-thief* are nouns. Though he did not explain clearly whether his term *head* as ascribed to a constituent only holds when both formal and semantic head coincide on that constituent, he emphasizes that the "distinction between endocentric and exocentric compounds is sometimes a matter of interpretation" (Fabb 2001: 68). Citing the compound *greenhouse*, he argues that whether one thinks *greenhouse* is an endocentric or exocentric compound depends on whether one thinks the meaning of the whole compound is a kind of house.

Namiki (2001), on the contrary, claims that the head should be identified on the basis of several parameters: semantic, morphological and, furthermore it should be taken into consideration the claim that the head is the morphosyntactic locus. To Namiki (2001), a compound may be semantically exocentric but may be endocentric in other parameters.

Guevara and Scalise (2009) argue contrary to the claim of Namiki (2001) by positing that the head of a compound is not always the locus of inflections and maintain that there are endocentric compounds that do not put any inflection on the head constituent (eg snake bite) and also there are exocentric compounds that take inflections (eg. pickpockets).

In this thesis, I make a distinction between formal and categorial exocentricity, though both may coincide on one constituent.

2.2.2.2.3 Types of exocentric compounds

Bauer (2008) posits bahuvrihi, exocentric synthetic, transpositional exocentric, exocentric co-compounds and metaphorical exocentric compounds as types of

exocentric compounds, based on cross-linguistic data from about fifty typologically different languages. According to Bauer (2008: 56) a bahuvrihi compound "expresses some salient facet of the denotatum." The term *bahuvrihi* (from Sanskrit) 'much rice' itself is an example of this type of compound since it refers to 'one who has much rice', although the meaning *one who* of the compound is not expressed by either of the compound constituents.

Appah (2016c) proposes two subclasses of bahuvrihi compounds: possessive and non-possessive. A possessive bahuvrihi compound refers to any compound whose meaning is the possessor of the compositional meaning of the compound and may therefore be schematized as "entity which possesses X" where X is the compositional meaning of the compound (Appah 2016c: 108). In Kayardild (Indo-European, Indo-Iranian), the form *kirr-maku* [lit. face + woman] means 'an effeminate looking man' (Evans 1995: 197), where the meaning of the compound is the possessor of the compositional meaning of the constituents of the compound. Non-possessive type of bahuvrihi compounds may include the agent or *causer* type which refers to the entity which causes the compositional meaning of the compound to undergo a particular effect.

With exocentric synthetic compound, the syntactic head (Dressler 2006) of the compound, usually a verb, and its internal argument form a noun that refers to the entity that plays the role of an external argument (Bauer 2008, 2010b). The French compound *gratte-ciel* 'skyscraper' [lit. scratch + sky], consists of the verb and its internal argument; however, the meaning of the whole compound refers to the external argument, *that which scratches the sky* (Bauer 2008).

Transpositional exocentric compound, according to Bauer (2010b: 171) is the type of exocentric compound that may be compositional or inherits its meaning from one of the constituents. However, the lexical category of the compound is not inherited from any of the constituents. It thus "functions as a member of an unexpected word-class" (Bauer 2008: 64) and thereby makes the compound appear like conversion. For instance, the Akan compound *gyédí* 'faith' [receive + eat] which is made up of two verbal constituents has a nominal category (Appah 2017a). Also, the Swahili nominal compound *ujau-zito* 'pregnancy' (lit. come + heavy), which consists of a verb and an adjective exemplifies this type of exocentric compounds (Bauer 2008). Fábregas and Scalise (2012) describe these compounds as categorially exocentric.

Exocentric co-compounds are those compounds in which the two constituents of the compounds are covertly coordinated and therefore enjoy parity in terms of meaning contribution to the compound as a whole. Thus, both constituents of the compound share headship. The Chantyal compound *nhe thara* 'dairy products' [lit. milk + buttermilk], exemplifies this type of exocentric compounds (cf. Bauer 2010a). Bisetto and Scalise (2005) call these compounds class changing co-compounds.

According to Bauer (2010a) metaphorical exocentric compounds refer to a class of compounds that fail the hyponymy test because the head constituent or the whole compound has a metaphorical interpretation. The compounds, *dust bowl* 'an area with no vegetation' and *catlick* 'quick wash' are examples of this type of exocentric compounds (cf. Bauer 2010a). Appah (2017b) explains that metaphorical exocentric compounds may arise when the head of the compound has metonymic interpretation (e.g., *phone neck* 'pain in the neck

caused by using a phone') or the whole compound is metonymic (e.g., *bear skin* 'hat won by certain soldiers'). Thus, metaphoric compounds "name an entity to which the denotatum of the compound is compared." (Bauer 2008:65).

Discussing exocentric compounds in Akan, Appah (2017b) observes that out of the five types identified by Bauer (2010a), bahuvrihi, exocentric synthetic and transpositional exocentric compounds are attested in Akan. The noun-noun compounds *àsò-kètέ* [àsó + kètέ] (lit. ear + mat) 'person with big ears' and *tòí-pàpà* (Gà) (tòí + pàpà) [lit ear fan] 'a person with ears resembling a fan' are examples of possessive bahuvrihi compounds because the meanings of the compounds are the possessors of the compositional meaning of the compound (Appah in press). The Akan noun-noun compound *àbírékyíré ábɔ́dwèsέ* [lit. goat + beard] 'elephant grass' and Ewe noun-noun compound *àŋɔ́-to* [lit. paint ear] 'dandelion' (Appah in press) are examples of non-possessive bahuvrihi compounds. These examples fall in the category Appah (2017b) calls property bahuvrihi compounds. This is because the meaning of the compound is the entity that has the property of the compositional meaning of the compound.

Appah (2017b) identifies the N-N compound, *àfíásé* (àfí+àsé) [lit.house + under] 'prison' as a kind of exocentric bahuvrihi compound that belongs to the class Location bahuvrihi. He observes that compounds of this type refers to a location in space as the case of *àfíásé* or time as depicted by the compound *m̀mòfrásé* (m̀mòfrá + àsé) 'childhood' [lit. children + under]. Appah (2017b) describes the compound *kɔ́ǹsúó* (kɔ́ + ǹsúó) 'one who fetches water' [lit. go water] as an example of agentive exocentric compound, while *díàmìá* (dí + àmìá) 'one who has suffered a misfortune [lit. suffer + trouble] is a patient

exocentric compound. Figure 4 illustrates the typology of exocentric compounds in Akan.

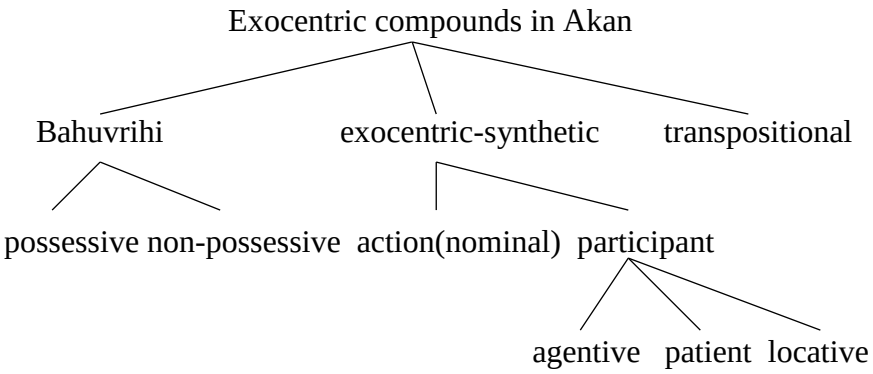


Figure 4: Typology of exocentric compounds (Appah 2017b:166)

This work classifies the various exocentric compounds in Dangme based on the typology of Appah (2017b). This will prove interesting as both Akan and Dangme belong to the Kwa language family, share boarders and are not too different in terms of their morphology. This work will therefore help us to find answers to the questions of which types of exocentric compounds may be found in Dangme and how are these Dangme exocentric compounds similar or different from that of Akan.

2.2.3 Distinguishing between compounds and other constructions

The issue of how to distinguish between compounds and phrase is very important because compounds are the closest morphological construction to phrases (Appah 2013b). For instance, compounds combine words just like phrases and the order of elements and relation between them can be just like those of syntactic phrases. Thus, it is important that we are able to find ways of clearly showing when to consider a group of words to be a phrase and when to

consider a group of words as a compound. This is particularly so with certain categories such as noun-adjective and verb-noun (cf. Appah 2013b).

Lieber & Štekauer (2009b), identify two crucial reasons why researchers on the phenomenon of compounding find it difficult to provide satisfying and universally applicable definition or features for determining compoundhood. They argue that "on the one hand, the elements that make up compounds in some languages are not free-standing words, but rather stems or roots. On the other hand, we cannot always make a clean distinction between compound words on the one hand and derived words or phrases on the other." (Lieber & Štekauer, 2009b:3).

According to Booij (2007: 75), compounding as a means of forming new lexemes has a defining property of "consisting of the combination of lexemes into larger words". Though this may not be a universally applicable distinction between compound and other constructions as observed by Omachonu and Onogu (2012), the fundamental distinction between compounds and derived words in most languages is that compounds consist of free-standing lexemes whereas derived words, in most cases, contain affixes (Lieber & Štekauer, 2009b; Omachonu & Onogu 2012).

The demarcation between compound and other structures is sometimes difficult to ascertain. For instance, Booij (2007: 85) posits that "a lexeme may develop into a derivational morpheme". Also, the elements that make up compounds in some languages may not be free-standing words, but rather stems or roots. (cf. Lieber & Štekauer 2009a). Nevertheless, Lieber and Štekauer (2009a: 2) argue that the use of the term lexeme is "specific enough to exclude affixes but broad enough to encompass the roots, stems, and free

words that make up compounds in typologically diverse languages." In the words *un-faith-ful-ness* and *seablue*, we may observe that whereas the forms in *unfaithfulness* do not occur as free forms in English with the exception of *faith*, the forms in *seablue* are free forms. Also, while *ọ̀là ọ́dà* (ọ̀là + ọ́dà) 'law' [lit. word command] is a compound in Igala, because the constituents are free lexemes, ùkoche (ù + koche) 'lesson' is a derived complex word in the language because the form *–ù* is a prefix and does not occur in isolation in any syntactic structure. Thus, the formation of the complex words, *unfaithfulness* in English and *ùkoche* in Igala, is via affixal derivation, while that of *seablue* and *ọ̀là ọ́dà* is compounding.

The question of when do we take a group of words to be a phrase and when we take a group of words to be a compound is very crucial to this study. This is particularly so with certain categories of compounds such as noun-adjective and verb-noun compounds. That is why some differences between compounds and phrases in the literature have to be considered to enable us clearly separate constructions that are compounds from those that are phrases.

In stress languages, one of the key properties of a compound that distinguishes it from a phrase is the stress pattern. It is observed that nominal compounds in English, for example, are stressed on the first element (compound stress rule); while noun phrases receive stress on the final element (nuclear stress rule). Plag (2003) observes that the systematic variation between stress asignment in a noun phrase and a compound headed by noun may result in a minimal pair, where the stress pattern alone distinguishes between the nominal compound and the noun phrase in terms of their interpretations. This is exemplified in (4).

4	**Nominal compound**	**Noun phrase**
a.	′blackboard	a black ′board
	‘ board for writing’	‘a board that is black’
b.	′greenhouse	a green ′house
	‘a glass building for growing plants’	‘a house that is green’

(Plag, 2003: 173)

In the examples in (4), the shift of stress causes a change in meaning. When the stress is on the first word as found in those in left column, a compound is formed. On the other hand, when the stress is placed on the second word as found in right column, a phrase is formed. Plag (2003: 178) maintains that “[c]ounterexamples to this generalisation exist, but in their majority there seem to be systematic exceptions that correlate with certain types of semantic interpretation or that are based on the analogy to existing compounds”. It is possible, also, that these stress patterns may change depending on the intentions of the speaker, especially during speech.

Compounds can be distinguished from phrases by internal modification. For instance, the nominal compound *blackbird* cannot allow an adjective to be inserted between the constituents so that the adjective modifies the right-hand constituent as in **black ugly bird* but the adjective has to modify the whole nominal compound as in *ugly blackbird.* However, the adjective *ugly* can intervene between *black* and *bird* if the construction is considered a phrase, as in *black ugly bird.*

Bauer (1998b: 77) observes that a construction like *blackbird* may be considered a compound if the second member of the structure cannot be replaced with a pro-form. Thus, in the structure *black 'bird,* the noun *bird* can be replaced with *one,* as in *the black one,* because it is a phrase. However, we

cannot replace *bird* in the compound *'blackbird,* which is a type of bird, to give us **'blackone.*

There are other properties that may distinguish compound words from phrases. They include how they are written and the position of the nucleus of inflection. Regarding how they are written, compounds are known to have three different forms. Sometimes, compounds are written together without space between the constituents as in the Akan compounds *díàmìá* (*dí* + *àmìá*) 'one who has suffered a misfortune and *àfíásé* (*àfí* + *ásé*) 'prison' or Lɛtɛ compounds *ńdámfʊ̀búé* (ńdámfʊ̀ + búé) 'friendship' and *ǹyìrèbíkyí* (ǹyìrèbí + kyí)'child care'. There are other compounds that are written as hyphenated words as are observable in the Ga compound *gbátsù-nàà* (gbátsù + nàà) 'prophecy room' (Appah in press) or the English compounds *man-made* and *spoon-feed*. Also, some compounds are written as two separate words as in *yellow fever* and *horse shoe.* There are however, no specific rules on these writing conventions, as some hyphenated and combined words in these languages are sometimes written as separate words. Therefore, how these compounds are written is not a major determinant of what constitutes a compound and what constitutes a phrase.

Concerning position of nucleus of inflection, we observe that inflectional morpheme is sometimes attached to the first constituent of compounds, as in *mothers-in-law* vs **mother-in-laws*, and sometimes to the second constituent, as observable in **dropped kick* vs. *drop kicked.* In chapter three, I look at what distinguishes compounds from derived nouns and NPs in Dangme. I explain, for example, that compound may trigger vowel deletion but a noun phrase may not.

2.2.4 Phonological Processes in Compounds

Phonological processes are often triggered during compounding. This shows explicitly the interface between morphology and phonology. These phonological processes include assimilation, segment deletion, segment insertion and prosodic alterations. This section looks at some of these phonological processes that are triggered during compounding in some Kwa languages.

Dolphyne (1988) observes several phonological properties occurring in Akan compounds. These phonological processes include homorganic nasal assimilation, affix vowel deletion, vowel harmony, tonal changes and nasalisation of voiced stops. She explains that these phonological processes do not occur in phrases and thereby help to distinguish between compounds and phrasal constructions.

According to Anderson (2013: 91) vowel harmony in Akan "is triggered by a [+ATR] vowel and spreads regressively to the preceding syllable in compounds, although, in non-compounds all vowels within a word must harmonise". Homorganic nasal assimilation occurs at morpheme boundaries when a nasal consonant precedes a stop. Hence, the nasal consonant takes the place of articulation of the adjacent stop. The examples in (5) illustrate this.

5. a. sɔ́ + ɐqɛ́ → ǹsɔ́ɐqɛ́, 'temptation'

   b. àsɛ́ḿ + bìsá → àsèm̀mìsá 'a question'

   c. àsɛ́ḿ + húnú → àsèǹhúnú 'senseless argument'

(Anderson, 2013: 91)

In (5a), the alveolar nasal /n/ that precedes the compound maintains its form because the adjacent sound is also an alveolar. However, in (5c), the final sound of the first constituent /m/ changes to [n] because the consonant it precedes is not bilabial. In (5b), the bilabial stop /b/ that begins the right-hand constituent *bìsá* 'ask' assimilates to the manner of articulation of the bilabial nasal /m/ that ends the left-land constituent *àsém̀* to become [m]. However, it is not always that these changes do occur. For instance, one would have expected that in the compound *àsémṕá* (àsɛ́m + pá) 'good news', the bilabial stop /p/would have changed to [m].

Dolphyne (1988) identifies two different tonal patterns of Akan compounds. These are compounds in which every syllables of the first stem is said on low tone irrespective of the tone pattern of the stem in isolation and those in which the syllables of the first stems are not said on low tone. The situation where all the tones of the first stem change to low tones has been described as H-Deletion (cf. Marfo, 2004). Examples (5b) and (5c) illustrate this. According to Anderson (2013: 91), "this process reflects a common phenomenon called tonal compactness in West African languages, whereby the tones of the first stem neutralise."

Anyidoho (1990) cited in Appah (2013b: 252) analyses down-stepping patterns of some noun-verb compounds in Akan and posits that a nominalising vowel or nasal stop with a low tone that occurs as a prefix to the second stem of the compound is usually deleted. She observes that the deletion of the prefix leaves the low tone floating, and that causes down stepping in the Akan compounds. This is seen in the compounds *nwóń!tó* [song + sing] 'singing'

and *ǹtáḿˡká* [oath + say] ‘oath taking’. In these examples, Anyidoho (1990) explains that the floating low tone of the second stem triggered the lowering of the high tones of the second constituents.

On the phonological processes of compounding in Lɛtɛ, Akrofi-Ansah (2012) observes that when two nouns are juxtaposed with vowels occurring at the boundary between the two constituents, the initial vowel of the second component is elided. This can be observed in the noun-noun compounds in (6) where the vowels /ø/ and /ə/ which precede the second stems are deleted in the compounds.

6. a. à-sɔ́ˡr í + ø-tsá [church + house] → àsɔ́ˡrítsà ‘chapel’

b. ó-wúrɛ̀ + ə́wú [chief + home]→ ówúréwù ‘palace

(Akrofi-Ansah 2012: 118)

Vowel harmony is another phonological process that occurs in Lɛtɛ compounds. In example (6b) she notes that there is regressive assimilation where /ɛ / is assimilated to become /e/ in line with vowel harmony principle after the vowel /ə / has been elided.

Furthermore, she observes tonal pattern change where a high tone on the second stem in its citation form becomes low when it combines with the first element. For instance, the final high tone on the stem *ə́wú* in the compound *ówúréwù* ‘palace’ in (5b) changes to a low tone. Akrofi-Ansah (2012: 119) explains that “[i]t is usual to produce the final syllable of a compound with a low tone when its tone in citation form was previously high”.

On the phonological processes in C'lela compounds, Aliero (2013) mentions segment metathesis, final-vowel deletion, vowel lowering, and nasal-insertion as probable when compounding occurs. Consider example (7).

7. a. ə̀rmə́ + gyə̀zó [man + red] → ə̀rə́m gyə̀zó 'brave man'
   b. d'bà + kàrgà [place + gathering] → bàd gàrkà 'assembly hall'
   c. k'kùrú + s'tə̀ [room + soup] → kùr-k s'tò 'vegetable'
   d. ká + ù'bù [someone + house] → ká nù'bù 'landlord'

(Aliero 2015: 37).

In (7a) it can be observed that the sequence of the sounds / a / & /m/ in the constituent *ə̀rmá* has been changed in the process of combining it with *gyə̀zó,* a process he calls segment metathesis. Non-adjacent metathesis (Aliero, 2015) is found in C'lela, where the prefix of the first constituent in a compound transposes to the final position of that constituent. Example (7b) illustrates this.

As observed by (Aliero 2013, 2015), compounding in C'lela may trigger deletion of the final vowel of the first disyllabic compound member. This occurs when the final vowel of the first stem has a preceding sonorant. For example, the deletion of the final vowel /-u/ in example (7c) may be perceived as the consequence of the occurrence of the stem-final liquid-vowel sequence in a compound construction (Aliero 2015: 37).

Nasal insertion is yet another phonological process observable in C'lela compounds. A compound in which the second constituent begins with a vowel usually has the alveolar nasal, /n-/ inserted before the vowel as shown in example (7d). The motivation for the insertion, as Aliero (2015) observed,

stems from the “general assumption that in syllabification, onsets are preferred over codas in the compound medial position in C’lela, a reason which conformably attracts nasal consonant insertion to help change syllabification in that environment so as to ease pronunciation”. (Aliero 2015: 40).

In this work, we attempt to find out which of these morpho-phonological processes occur in Dangme compounds. In chapter five of the thesis, I discuss vowel deletion, vowel lengthening and vowel coalescence as some of the phonological processes that occur during compounding in Dangme and argue that they serve as the yardstick for distinguishing compounds from noun phrases.

2.3. Theoretical Framework: Construction Morphology

Construction Morphology (CxM) is a theory of linguistic morphology that builds on insights from Construction Grammar (CxG) in the early 2000s. The theory deals with the structure, formation and meaning of words. It is an approach to the grammar of words which seeks to account for the proper characterization of the internal composition of complex words. Appah (2013b) argues that a morphological theory must seek to specify the acceptable constituents of complex words, the order in which those constituents can appear and indicate well-formedness constraints on complex words. Such a theory should also indicate what sorts of new words a speaker could form. Construction Morphology meets all of these criteria.

According to Booij (2010c: 543), CxM “aims at a better understanding of the relation between syntax, morphology, and the lexicon, and of the semantic properties of complex words”. CxM, therefore, provides a framework within

which both the differences and the commonalities of word level and phrase level constructs can be accounted for (Booij 2010b). With CxM, morphologists are able to account for the meanings of morphological constructs. The prediction of CxM is that the meaning of any morphological construct is a property of the construction and may not necessarily be a function of the meanings of the individual constituents (Booij 2010b).

The constructionist approach can be justified and argued for when we consider the cause-motion construction in (8) where the meaning of the construction does not depend entirely on the meanings of the constituents.

8. Pat sneezed the foam off the cappuccino. (Goldberg 2006: 73)

In this example, the intransitive verb is used transitively and correlates with the presence of an object that moves along a path, specified by the preposition off. The transitive use of the verb *sneeze* and the meaning that the action sneezing which caused the foam to move must be understood as a holistic properties of the construction (cf. Goldberg 2006; Appah 2013b: 25).

Another construction whose semantic properties cannot be fully accounted for by the rule of compositionality is the English “time-away” construction with the structure [V NP away] as illustrated in (9).

9. Francis slept the holidays away. (Appah 2013b: 25)

In example (9), the semantic properties of the construction cannot be fully accounted for by strict compositionality and therefore the meaning of the

utterance cannot be ascertained by just considering the meanings of the words that make up the utterance. For instance, 'sleeping the entire holiday period' which the meaning of the utterance evokes does not appear obvious, especially, as the verb *sleep* is prototypically intransitive. Thus, in CxM, "any set of form-meaning constraints that cannot be derived compositionally from the form-meaning constraints on its constituent elements is considered a construction" (Gurevich 2006:49). This implies that the meaning of the sentences (8&9) are holistic properties of the constructions. Hence, to account for the meanings of these constructions, we need a framework that views the meanings of constructions as holistic properties and not necessarily compositional.

The main tenets of Booij's CxM are a theory of word structure, a theory of the notion 'construction' and a theory of the lexicon. Stressing the strength of Booij's model of CxM in accounting for the semantic properties of complex words, Gurevich (2006) maintains that Booij's model lays the foundation of CxM in Construction Grammar because it gives an insightful account of the properties of words (Booij 2010b). In the subsections that follow, I discuss the tenets of CxM.

2.3.1 The theory of word structure in CxM

Two main approaches to linguistic analysis of complex words are found in the literature: morpheme-based (Halle 1973; Kiparsky 1982; Siegel 1974) and word-based (Aronoff 1976; Anderson 1992). Morpheme-based morphology assumes that word formation rules operate over morphemes. In the morpheme-based approach, a morphologically complex word is seen as a concatenation of morphemes. According to Booij (2010b: 1) this approach to morphological

analysis may be understood as "syntax of morphemes". Appah (2013b: 47) posits that the "morpheme-based approaches isolate recurrent bases and exponents within a system and encapsulate each in a rule or entry that represents its grammatical properties."

The principal goal of morphology in morpheme-based approaches is to account for the relationship between a word and its constituents. According Appah (2013b: 47) "morphological analysis in this approach therefore involves morphotactics (a process of segmentation and classification) and allomorphy (responsible for the shape of the morphemes in the complex words)". Considering the word *singer,* we would assume that it is formed through the concatenation of verbal morpheme *sing* and the nominalising suffix *–er* that encodes the meaning 'agent'. Booij (2010b: 2) maintains that "morpheme-based approach sees morphologically complex words as the outcome of the manipulation of morphemes that takes place in the syntax." The basic assumption behind the morpheme-based approach is that "variation in form is determined by variation in meaning: smallest elements of form correspond to smallest elements of meaning, and so when one changes, so does the other" (Gurevich 2006:36).

The main challenge to this approach to morphological analysis is that a form may appear in another construction but may not carry the supposed meaning (Booij 2005). For instance, in the word *cooker*, and *villager*, the suffix *–er* does not carry the meaning 'agent', *one who V's* but *instrument* and *one who lives at village* respectively. The same argument can be made about the *–er* in *stronger* which does not carry the meaning 'agent' but 'comparative' (cf.

Lieber 2004). This shows that the meaning of the morpheme depends on the construction and not necessarily the morphem.

Another problem with the morpheme-based approach is its inability to account for polysemous words where a particular form may have different context-specific meanings. For example, the form *chair* sometimes means, "an object that we sit on" or "the leader of a meeting or a committee". There are times too that different affixes tend to have the same function or create the same kind of derived words. For example, English *-ize* and *-ify* create causative verbs whilst *-er* and *-ant* form agentive nouns. This problem is referred to as "multiple affixation question" (cf. Appah 2013b; Lieber, 2010).

The issue of semantic mismatch, where the correspondence between form and meanings usually deviates from the one-to-one ideal, is also a huge challenge to this approach to morphological analysis (Appah 2013b; Booij 2010b; Gurevich 2006). The semantic mismatch takes the form of 'empty morphs', which are forms that make no meaning contribution to the complex words they form constituents of. For instance the *–it-* in *compet**it**ive* and the *–in-* in word *attitud**in**al* do not seem to add anything to the meanings of the respective words. Also, the forms *–re, -di,* and *-a* found in non-absolutive noun forms as suffixes that intervene between the roots and the case marking morphemes in Lezgian do not carry any meaning as shown in (10) below.

10.	Absolutive:	sew	fil	Rahim
	Genitive:	sew-re-n	fil-di-n	Rahim-a-n
	Dative:	sew-re-z	fil-di-z	Rahim-a-z
	Subessīve:	sew-re-k	fil-di-k	Rahim-a-k
		`bear'	`elephant'	'male nam'

(Haspelmath 2002)

In the word *geographical* the form *-al* does not mean anything because the word as an adjective has already been established by the preceding form *–ic*, a situation described as "derivational redundancy" (Lieber 2004: 2).

Meaningful units that do not have any physical shape, usually known as 'zero morph' like the plural in English words like *sheep* and *luggage* is another meaning mismatch problem of the morpheme-based approach. Portmanteau morph, a formal unit which cumulatively expresses two or more meaning units, as in the case of the form *-s* which occurs on English verbs to express third person, singular and present tense, is another challenge for morpheme-based approach (Gurevich 2006). This is because portmanteau morphs have several grammatical functions associated with a single morph.

These issues show that the formal or semantic properties of a word form cannot be fully attributed to its constituent parts, and that sub-word units may not necessarily carry enough information to reconstruct the original meaning of a word (cf. Blevins, 2006). These weaknesses of the morpheme-based approach form the basis for the need for an alternative approach, word-based approach to morphological analysis which will consider the word as the basic unit of analysis (Blevins 2006; Booij 2005; Gurevich 2006).

The word-based approach to morphological analysis, unlike the morpheme-based approach, considers the word as the basic unit of morphological analysis (Booij 2005; Gurevich 2006). In the word-based approach, new words are formed by applying a word formation rule to a single already existing word which results in a new word. Both the novel word and

the already existing word from which it was formed are members of major lexical categories (cf. Booij 1977; Scalise 1984). The implication of the word-based approach is that each word is a linguistic sign, form-meaning pair. The form of a word comprises of its phonological form and its morphosyntactic properties (Booij 2010b).

The holistic property of a construction can be observed from the fact that bound morphemes do not have any meaning of their own. For example, the suffix *-ion* in the words *correction* and *creation* does not carry a meaning of its own when it occurs in isolation and therefore it is the constructional schema as a whole which consists of the combination of the base verbs and the suffix *-ion* that evokes the meaning of *that which is corrected* and *that which is created* respectively. The understanding that *-ion* as well as other affixes like *–er* do not occur all by themselves comes from the fact that CxM is not morpheme-based but word-based. CxM, as observed by Gurevich (2006), reinstates the role of whole words as the surest means of capturing morphological generalizations. In this respect, CxM is consistent with Word and Paradigm (Hocket 1954) morphology in taking a "top-down" view of the structural properties of words, where larger structures determine both the overall meaning and the selection of smaller units within the complex forms.

Being abstractionist and word-based, the theory of word structure in CxM builds on the idea that the word is the minimal linguistic sign, a form-meaning pair. Thus, the structure of a word consistsof its phonological form and its morphosyntactic properties. Three types of information are thus linked to a word: PHON(ological), SYN(tactic) and SEM(antic) and as Booij (2010d: 5) argues, "any morphological system or the grammar of words must deal with

the systematic relation between all three components." The theory of word structure in CxM then portrays a word as a complex piece of information that connects a particular sequence of sounds to a particular meaning as illustrated in Figures 5 and 6.

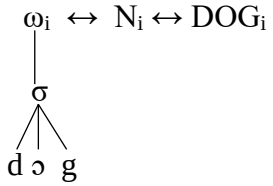


Figure 5: Lexical representation of dog (Booij, 2010b: 7)

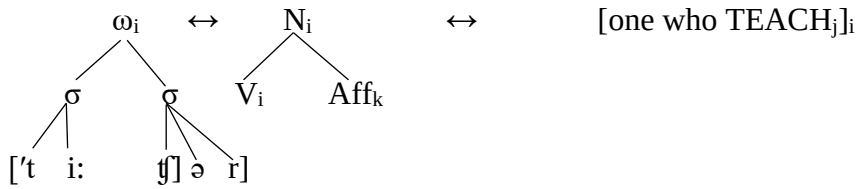


Figure 6: Lexical representation of teacher (Booij 2010b: 7)

The first piece of information in Figures 5 & 6 is the phonological properties of the words (ω) that consist of the one syllable in Figure 5 and two syllables in Figure 6. The phonological word bears the same syntactic information (N) and is co-indexed with the semantic information. According to Booij (2010b: 7) "co-indexation is used to specify the correspondence between the three kinds of information involved in knowing a word and thereby reflecting the tripartite parallel structure."

Booij (2016) maintains that the phonological representation of a complex word may not necessarily be isomorphic with its morphosyntactic representation. For example, the word *teacher* in Figure 6 has the morphosyntactic structure $[[\text{teach}]_V$ -er$]_N$, and is a phonological word that is disyllabic, with primary stress on the first syllable $(\text{ 'ti:• ʧər})_\omega$. The dot in the

transcribed form of the word marks syllable boundary, whiles the symbol *ω* stands for ‘phonological word’. It must be noted that the word-internal syllable boundary does not coincide with the word-internal morphological boundary, which is located after the sound / ʧ /, as in / 'ti:ʧ •-ər/. The suffix *-er* forms one domain of syllabification with its verbal stem which means that the morpheme boundary is ignored in the syllabification (Booij 2016).

Though the word’s internal phonological boundary does not correspond to morpheme boundary, the boundary of English compounds coincides with syllable boundaries. For instance, Booij (2016: 432) observes that “in the compound *dance-act* [dæns.ækt], the sound /s/ is not syllabified as the onset of the second syllable, because the compound is made up of two phonological words, dance (dæns)ω and act (ækt)ω”. The two types of interfaces, shown in the words *teacher* and *dance* act, indicates that two different schemas are required: one for cohering suffixes and one for compounds. In other words, these two words are formed from two different schemas, a schema for affixation and a schema for compounding, respectively.

Phonological representations sometimes tend to correspond to specific syntactic or morphological constructions. Thus, constructions may exhibit holistic phonological properties, as noted by Inkelas (2014). The morphosyntactic properties of complex words consist of the part of speech of the complex word as well as that of its base, the inflected forms that mark number, tense, aspect and mood or agreement properties such as gender.

2.3.2 Construction and schemas

CxM assumes that speakers of languages are able to asign meanings to the internal structures of words if there is a systematic correlation between form

and meaning based on comparison between sets of related word forms (Booij 2016). For example, the English complex words with the suffix *–less* in (11) are in paradigmatic relationship with their base nouns *home, end, fear, sense* and *hope,* respectively.

11.	a.	*home*	b.	*homeless*
		end		*endless*
		fear		*fearless*
		sense		*senseless*
		hope		*hopeless*

The suffix *-less* in the examples in (11) denotes the property of being without something (Booij 2016). The words in (11) can be asigned internal structure as shown in (12).

12. $[[home]_N less]_A$
$[[end]_N less]_A$
$[[fear]_N less]_A$.

The form–meaning correspondences observable from the complex words in (12) can be illustrated in constructional schemas that serve as templatic representations of the complex morphological constructions as shown in (13).

13. $< [X]_{Ni} less]_{Aj} \leftrightarrow [\text{Property of being without } SEM_i]_j >$ (Booij 2016: 425)

The double arrow in the schemas (13) indicates the correlation between form (of the word) and meaning (of the word). The systematic correlation between

form and meaning is specified through co-indexation. The index *i* in the examples indicates that the meaning of the base word (SEM) recurs in that of the corresponding complex word (Booij 2016). The index *j* on the other hand shows that the meaning of the construction as a whole correlates with the form of the complex word as a whole. The angled bracket (<, >) demarcates the boundaries of the construction. The variables *X* in these schemas represent the phonological content of the base of the word, and therefore indicates an unoccupied slot which must be filled with a concrete base. These complex words instantiate the schema in (13).

According to Booij (2010b: 2), words in example (11) reflect a paradigmatic relationship between those in the right column (b) and those in the left column (a) as opposed to syntagmatic relationship that holds for words in sentences and phrases.

Compounding has been one of the areas in linguistic study where CxM has been used (Appah 2013, 2015, 2017; Booij 2005, 2010b, 2013, 2016). Accounting for the meaning of exocentric compounds, for instance, requires a framework that sees meanings of constructions as constructional properties. For instance, Appah (2015: 110) establishes that the compounds *kɔ́ǹsúó* and *kɔ́àyíé* which are formed from the bases *kɔ́* + *ǹsúó* (fetch + water) and *kɔ́* + *àyíé* (attend + funeral) denote *one who fetches water* and *one who attends funeral* respectively. However, the meaning *one who* which denotes the agent is not inherited from the constituents of the compounds and can therefore be said to be a holistic property of the entire construction. Also, Booij (2013) observes that in the Italian verb-noun compound *lava piatti* ‘dish washer’ [lit. wash-

dishes], the meaning *AGENT* does not come from the constituents and therefore must be considered a constructional property.

Compound formation patterns as represented in the form of constructional schemas enable us to posit generalisations about subcategories of complex words by resorting to subschemas, in between the most general schemas and the individual words. The essence of schemas is exemplified by the right-headed endocentric compounds in Akan as illustrated in (14).

14. $< [[a]_{Xi}\ [b]_{Yj}]_{Nk} \leftrightarrow [SEM_j \text{ with relation } \Re \text{ to } SEM_i]_k >$ (Appah 2013b: 70)

In this schema, the double arrow symbolizes the relationship between a particular form and a particular meaning. The upper case variables *X* and *Y* stand for the major lexical categories (nouns, verb, adjective, and adverb). The variables *a* and *b* stand for arbitrary sound sequences. The variables *i*, *j*, and *k* stand for the lexical indexes on the phonological, syntactic, and semantic (SEM) properties of the words (Appah 2013b: 70).

The schema in (14) is for a right-headed compound of the type *black board*, where *X* is instantiated as *black* and *Y* as *board* with the relation ℜ spelled out as " is". That is, *blackboard* **is** a *board* that is **black** (cf. Booij 2010a, 2013, 2016).

The existence of abstract schemas, as shown in (13) and (14), in the lexicon enables language speakers to be creative as they are able to coin novel words and word forms that are consistent with the abstract schemas (Booij 2010b). Originating from CxG, CxM sees the basic unit of linguistic analysis as a construction rather than a single morpheme.

The notion *construction* is defined as "a pairing of form and meaning" (Booij 2010b: 2). Analyzing words in terms of construction enhances a better understanding of the properties of complex words (cf. Appah 2013b, 2016b; Booij, 2010b, 2013, 2016 Wulff 2013). According to Jackendoff (2008: 15), "pieces of syntactic structure can be listed in the lexicon with associated meanings, just as individual words are; and these are the meaningful constructions in the language." CxG from which CxM emanated makes no distinction between words and rules.

Constructionists have argued that the "basic units stored in the lexicon are constructions, which are individual schemas consisting of pairs of forms and meanings, and they are used to organize the existing forms in the lexicon and create new forms" (Fábregas and Scalise 2012: 38). In this regard, meaning is not associated with individual constituents but the word as whole.

In CxM, language users are assumed to make generalisations about the predictable properties of existing complex words which are captured in templates, referred to as schemas (Booij 2013, 2016; Wulff 2013). These morphological schemas are considered as associations between lexical items that occur at phonological, syntactic, morphological and semantic levels. On the phonological level, lexical items might be marked by initial segment, rhyme, stress pattern, or the number of syllables. On the syntactic level, they might be marked by categorial membership (e.g., noun or verb). On the semantic level, they might be identified by being similar or opposite in meaning, or by belonging to the same semantic field (Appah 2013b: 75) as shown in Figure 7.

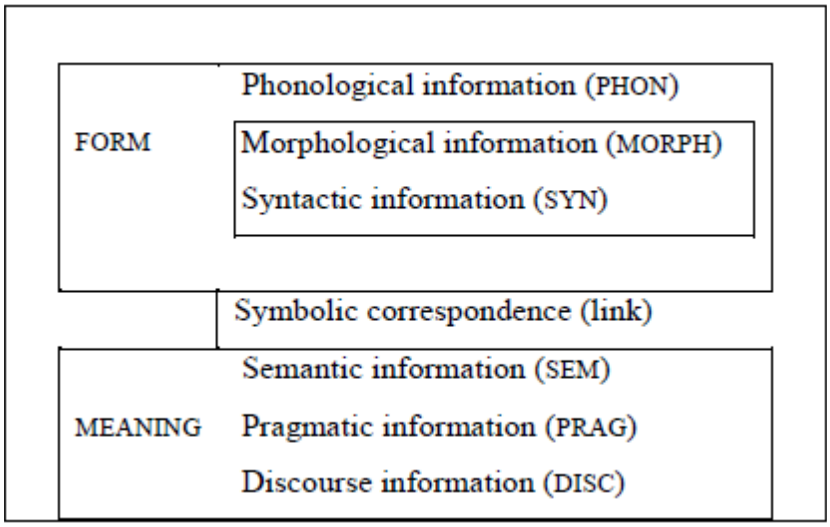


Figure 7:A construction in CxM (Booij 2016)

The form of a morphological construction, as can be seen in Figure 7, encompasses both phonological and morphosyntactic properties. Morphological construction schemas indicate "how new words are formed and they have the function of motivation with respect to the set of existing complex words of a language, the conventional lexicon" (Booij 2016:343). Motivation is used to mean the reduction of the degree of arbitrariness between form-meaning pairs (Fábregas & Scalise 2012). Jackendoff (2002) observes that word formation consists of multiple "generative engines" connected by interface models. Schemas, therefore, conflate different levels making the grammar of natural languages to have a tripartite parallel architecture comprising of the phonology, morphosyntax, and meaning.

The meaning component of the morphological construct may consist of semantic properties, pragmatic and discourse properties. In other words, the level of meaning in complex words comprises various sublevels. A typical example of a morphologically expressed pragmatic property is that of the diminutive words in Akan, where the diminutive morpheme ***ba***, when attached

to bases, express various pragmatic meanings including, endearment, member of, young and insignificance (Appah & Amfo 2011: 87) as show in (15).

15. a. ɔ̀hénébá (As./Ak.), _henba (Fa.) ‘prince/princess, [lit. child of a king]
    b. ɔ̀krábá (As./Ak.), agyīnamoaba (Fa.) ‘kitten’ [lit. offspring of a cat]
    c. ɔ̀bùròníbá ‘a young white or lightly coloured person’
    e. àsɔ́rébá ‘a church member’ [lit. child of a church]
    f. ɔ̀mámbá ‘citizen’ [lit. child of a nation] (Appah & Amfo 2011)

2.3.3 The Lexicon in CxM

The term LEXICON has been used to refer to a synchronic component of the language faculty or a component of the grammar of a language which minimally contains a specification of the lexical units of that language (Appah 2013b; Bloomfield 1933; Kiparsky 1982). Booij (2005: 17) describes it as the “repository of all information concerning the established words and other established expressions of a language.” The lexicon is sometimes called mental lexicon to emphasize the fact that it should be seen as a cognitive concept. For instance, Booij (2005: 17) argues that “ the lexicon is an abstract linguistic entity, to be distinguished from the notion dictionary, which refers to practical sources of lexical information for the language user in some material (paper or electronic) form.” According to Spencer (1991:47), “the lexicon must contain any idiosyncratic information about its entries (lexemes)”

The lexicon is assumed to be structured and contains structures of different internal complexity (cf. Aronoff 1976; Katamba & Stonham 2006). Language speakers have the intuition of what qualifies as a word or a potential

word in their language. Thus, speakers of a language are able to tell (a) what a word in their language is, (b) what the components of words are, if any, and (c) which combinations of those components are acceptable and which are not (Appah 2013b; Spencer 1991). For example, an English speaker knows that, (i) *boy* is an English word, but *nyùmũ* is not, (ii) certain words have internal structure (e.g. un-faith-ful-ness), and (iii) word-internal structure must occur in a certain order of arrangement of the constituents, so that the arrangement of the constituents in *un-faith-ful-ness* is acceptable but, **un-ful-ness-faith* and **faith-un-ness-ful* are not (Appah 2013b; Spencer 1991).

The lexicon contains words and complex structures whose meanings need to be memorised. Thus, any conventionalised or lexicalised structure needs to be stored in the lexicon with its meaning. The lexicon is thus construed to contain form-meaning correspondences (constructions). For example, the arbitrariness of relation between the form and meaning of *transmission* 'a part of a car' and *bookworm* 'someone who likes reading', means that these constructions have to be stored in the lexicon independent of their constituents (Appah 2013b; Lieber 1992). Di Sciullo and Williams (1987: 3) argue that "[t]o the extent that an object does not have the form or interpretation specified by the recursive definition of the objects of the language, that object and its properties must be memorised". They call the memorised elements in the lexicon *listemes* and the property of being memorised as *listedness* (Di Sciullo & Williams 1987: 3).

However, the lexicon does not only contain irregularities and arbitrary facts. From the lexicalist perspective, the lexicon is the component of grammar that houses the vocabulary and word formation rules of a language. With this

view, the "lexicon emerges as an active component of the grammar" (Appah 2013b: 89).

The items stored in the lexicon are called lexemes. These lexemes, both simplex and complex, are listed in the lexicon to the extent that they are established, conventionalised units. The lexicon specifies the properties of each word, its meaning, phonological form and its morphological and syntactic properties. The basic structure of lexical entries for the lexemes SWIM and SWIMMER is shown in (16).

16. /swim/ /swim er/

$[x]_V$ $[[x]_V \text{ er}]_N$

SWIM $_{\text{ACTIVITY}}$ PERSON PERFORMING SWIM $_{\text{ACTIVITY}}$

(Booij 2005: 17).

The first line in these lexical entries specifies the phonological form of these lexemes, the sequence of sound segments between slashes. The categorial information and internal morphological structure are specified in the second line. On the third line, the meaning of the lexeme is specified. Thus any entry in the lexicon "expresses a correspondence between phonological, syntactic, and semantic pieces of information, just like morphological rules or templates, which do the same at a more abstract level, in a generalised fashion, with variables taking the place of the individual properties of lexemes" (Booij 2005:17). Anytime a word is formed, it gets established in the language as an acceptable word. Thus, it is used by more than one native speaker of the language and it is used on different occasions. The established word then becomes part of the "lexical norm or lexical convention" of that language.

According to Booij (2005: 18), “the lexicon as the set of established lexical units of a language may have a blocking effect on the creation of new words.” Hence, the fact that *money machine* is not used in English to refer to a machine that dispenses cash is because there is another word, *automatic teller machine* (ATM) blocking it (cf. Aronoff 1976; Katamba & Stonham 2006; Kiparsky 1982).

2.3.3.1 The hierarchical lexicon

The prediction of CxM is that morphological constructions exist in the lexicon together with schemas that they instantiate. This results in two main relations: “part of” relation and “instantiation relation”. The relation between the complex word and its components is called “part of” relation (Booij 2010b; Appah 2013b) whereas the relation between the abstract schema and the complex word that is formed by the schema is called *instantiation*. That is, the compound is formed by the schema that is dominating it. The *part of* relation is exemplified in (17) below because both *àsɔ́ré* ‘church’ and *dáǹ* ‘building’ are constituents of the compound *àsɔ́rédáǹ* and therefore constitute ‘part of’ the complex construction (compound).

17. $< [[N]_i\ [N]_j]_{Nk} \leftrightarrow [SEM_j \text{ meant for } SEM_i]_k >$

$[\text{àsɔ́ré}]_{Ni}\ [\text{dáǹ}]_{Nj}]_{Nk} \leftrightarrow [\text{dáǹ}_j \text{ used for àsɔ́ré}_i]_k >$

church building “chapel” (Appah, 2015: 363)

The relationship between words determines the nature of relation between morphological schemas in the lexicon. This morphological model has been

regarded as the network model with the notion ‘network’ considered an appropriate term for conceptualising the kind of relationships that exist between words as they appear in the lexicon (cf. Appah 2013b). The lexicon is assumed to be structured hierarchically as a result of the multiple relations constructions and schemas keep (Appah 2015b).

The schema in (17) above is linked with other schemas in the lexicon that contain either *àsɔ́ré* such as *àsɔ́ré twènέ* ‘church drum’ and *àsɔ́ré káá* ‘church vehicle’ or *dàǹ* such as *súkúúdáǹ* ‘school building’ and *dɔ̀tèdáǹ* ‘mad building’(cf.. Appah 2015). This, according to Appah (2015: 364), “creates the network of related words, a conceptualisation of the lexical knowledge of the speakers of the language”.

2.4. Chapter Summary

The chapter discussed some of the core issues in compounding, dealing with the definition of compounding, interpretation of compounds and classification of compounds. It has been shown from the literature on compounding that linguists do not agree on the definition of compound, a situation attributed to the lack of uniformity in the choice of terminology in describing the constituents of compounds. The chapter has shown that different authors have different terminologies for compound members which shows in the definitions of compounds. The problem however is understandable, given the fact that languages are not the same and what constitutes a root, stem or word in one language may be different in another language.

The chapter also reviewed the literature on compounding in Akan, Lɛtɛ and C’lele. The review of works on these Kwa languages has shown that

compound words are either left-headed or right-headed or even headless and so their meanings must be regarded as holistic constructional property. On the category of words that combine to form compounds, has been observed that several combinations including noun-noun, noun-adjective, noun-verb and verb-nouns exist in languages. In Akan and Lɛtɛ, all compounds are nominals irrespective of the categories of the constituents.

On the morpho-phonological processes that are triggered by compounding, the literature has shown varied processes. They include vowel deletion, which is very pervasive in these languages, and vowel harmony, homorganic nasal assimilation and tone pattern changes common in Lɛtɛ and Akan.

The chapter has discussed CxM, the framework for the analysis of the data in this study. It has been shown that in CxM, complex words are seen as constructions at the word level where *construction* defined as a pairing of form and meaning in the lexicon which is assumed to contain not only simplex words but also complex ones. I have shown with examples that CxM is an adequate theory to handle complex morphological constructions, because it is able to account for constructions whose meaning and syntactic properties are not traceable to any of their constituents, making it the ideal theory for the analysis of the data in this study.

CHAPTER THREE

THE NATURE OF DANGME COMPOUNDS

3.1 Introduction

Compound words have been studied across languages. However, there has not been an agreed general definition for compound words among linguists. This has resulted in linguists calling for language specific description of compounds (cf. Bauer 2005, 2006; Omachonu & Onogu 2012; Scalise & Vogel 2010b). Omachonu and Onogu, (2012), put it better when they observe that:

> A critical look at the extant literature on compounding in the languages (even African linguistics in general) would reveal that providing satisfactory criteria for defining or determining compoundhood still requires both language specific and cross-linguistic investigations for dependable linguistic generalizations.
>
> (Omachonu & Onogu 2012)

This chapter, based on the need for language specific description of compounds, looks at the nature of Dangme linguistic constructions that qualify as compound words. The classes of Dangme compounds based on the grammatical categories of the compound constituents, relations holding between the compound constituents and headedness of the compounds are also discussed in this chapter.

Concerning how to determine compoundhood of words in Dangme, I show that both formal and semantic criteria may be used to distinguish compounds from other structures such as noun phrases and derived complex

words. On the classification of Compounds in Dangme based on the syntactic categories of the constituents, the identified possible combinations of syntactic categories in the formation of Dangme compounds are noun-noun, noun-postposition, noun-adjective, noun-verb and verb-noun. In this chapter, I look at N-N, N-P and N-A compounds in the language. In section 3.2, I discuss the nature of Dangme compounds by establishing what constitutes a compound in the language and the criteria by which we can judge the compoundhood of Dangme words. In section 3.3, I present the discussion of the types of Dangme compounds. I classify Dangme compounds based on syntactic categories of the constituents. The section also discusses some of the relations that exist between the compound members. The summary of the chapter is presented in section 3.4.

3.2 Determining compoundhood in Dangme

The concept of compounding is really pervasive in most languages in the world, and there are volumes of literature on the phenomenon. However, universally accepted criteria for determining compoundhood are barely available. A critical assessment of the existing literature on the phenomenon shows that the definition and criteria for determining compounhood require "language specific and cross-linguistic investigations for dependable linguistic generalisations" (Omachonu & Onogu 2012: 93). Hence, the focus of this section is to show how to determine compoundhood of words in Dangme and provide the answer to the question: what features characterize compound words in the language? The criteria used are formal (syntactic and phonological) and semantic.

3.2.1 Formal properties of Dangme compounds.

Compound words are differentiated from derived words in most languages by the fact that in most languages compounds consist of free-standing forms whereas derived forms contain affixes (cf.. Lieber & Štekauer 2009b). As Booij (2007: 85) observes, this distinction may not work for all languages because "a lexeme may develop into a derivational morpheme" and the elements that make up compounds in some languages in the world may be bound roots or stems. Nevertheless, Lieber & Štekauer (2009b: 2) consider the term lexeme to be "specific enough to exclude affixes but broad enough to encompass the roots, stems, and free words that make up compounds in typologically diverse languages".

In Dangme, the examples in Table 4 are typical nominal compounds because the constituents are attested free forms in the language.

Table 4. Dangme nominal compounds

Base 1	Gloss	Base2	Gloss	Compound	Type	Translation
blɛ̀fó	foreign	tã̀	palmtree	blɛ̀fótã̀	N-N	pineapple
lā	fire	zũ	soil	lazũ	N-N	ash
tsō	tree	gbá	split	tsō gbám̀	N-V	lumbering
tɛ́	stone	sà	bed	tɛ́sà	N-N	bedrock
nyɛ̀	mother	ngūā	big	nyɛ̀ngūā	N-A	elderly aunt
sɔ̀lèm̀	church	tsũ	house	sɔ̀lèm̀tsũ	N-N	chapel
yī	head	àgbò	big	yī àgbò	N-A	big headed

The complex words in (1) below are derived words with overt derivational suffixes. Deverbal nouns in Dangme are formed when the suffix *lɔ̄* 'one who'

attaches to verbs, as in (1a-b) below. This is a very productive derivational process in Dangme, even though the language does not show much of agglutination. In example (1c), we observe the clitic form of the noun *mi* 'inside' on the noun *tsũ* 'house'.

1. a. já + lɔ̄ → jálɔ̄
   'worship' suffix (agent) 'worshiper'
   b. mã + lɔ̄ → mãlɔ̄
   'to build' suffix (agent) 'builder'
   c. tsũ + m → tsũm
   'house' inside 'room'

In Table 4, we observe that both base 1 and base 2 are free forms in the language whereas the right-hand constituents of the words in example (1) are not free forms: they are suffixes because they cannot stand on their own in any syntactic structure but must always be attached to a base as illustrated in examples (2) and (3). In the examples in (2), we see that the constituents in the compounds *sɔ̀lɛ̀mtsũ* 'chapel', *tsō gbám* 'lumbering' and *nyɛ̀ngūā* 'elderly aunt' can stand on their own as words in sentences (2a – 2f). This shows that these words are independent lexemes in Dangme.

2. a. Àdwó yà sɔ̀lɛ̀m̀.
   Àdwó go.PST church
   'Àdwó went to church'
   b. Àdwó mã tsũ.
   Àdwó build.PST house
   'Àdwó built a house'

c. Àdwó jè sɔ̀lèm̀tsũ ɔ̃ mĩ.
Àdwó leave.PST chapel DEF inside
'Àdwó left the chapel'

d. Tɛ̀tɛ̀ gbá tsō ɔ̄.
Tɛ̀tɛ̀ split.PST tree DEF
'Tɛ̀tɛ̀ sawed the tree'

e. Àdwó jí Tɛ̀tɛ̀ nyɛ̀.
Àdwó BE Tɛ̀tɛ̀ mother
'Àdwó is the mother of Tɛ̀tɛ̀'

f. Tsō ngūā ā kũ.
tree big DEF break.PST
'The big tree broke'

On the other hand, not all constituents of derived words, as shown in example (1) are independent words in the language as illustrated in example (3).

3. a. Wɔ́ já-lɔ̄ jí Àdwó
idol worship-AGENT BE Àdwó
'Àdwó is an idol worshipper'

b. *Àdwó nǎ já lɔ̄ ɔ̄.
Àdwó see. PST worship suffix DEF
'Àdwó saw the worshipper'

c. Tɛ̀tɛ̀ jè tsũ-m̀.
Tɛ̀tɛ̀ leave.PST house-inside
'Tɛ̀tɛ̀ left the room'

d * Tɛ̀tɛ̀ jè tsũ m̀.
Tɛ̀tɛ̀ leave.PST room inside
'Tɛ̀tɛ̀ entered the room'

In the sentences (3a-c) above, we see that the suffixes -*lɔ* and *m* are attached to the verb base *já* 'to worship' to derive agentive deverbal noun, *jálɔ̄* 'worshipper' and the noun *tsũ* 'house' to derive *tsũm* 'room' respectively. In (3b &d), however, because the suffixes have been presented as though were lexemes by appearing as free forms, the sentences are unacceptable.

Dangme compounds may trigger vowel deletion in rare cases and this is exhibited in noun-adjective compounds and numeral compounds. Consider the examples in (4).

4. a. lɔ́lé + éhé → lɔ́léhé
   lorry new 'new vehicle'
   b. [Lɔ́lé éhé ɔ̄] bà bè mɔ̀tù ɔ̄.
   vehicle new DET come pass morning DEF
   'the new vehicle came and passed in the morning'
   c. Tɛ̀tɛ̀ lá kpɛ́té nyìgmítɛ̃.
   Tɛ̀tɛ̀ pluck.PST orange thirty
   'Tɛ̀tɛ̀ plucked thirty oranges'
   d. Tɛ̀tɛ̀ ngɛ̄ kpɛ́té nyìgmítɛ̃ kɛ̄ étɛ̃.
   Tɛ̀tɛ̀ has orange thirty CONJ. three
   'Tɛ̀tɛ̀ has thirty oranges'

In (4a), we observe the deletion of the vowel /e/ that begins the adjective *éhé* 'new' while the same segment is maintained in the noun phrase in (4b). In (4a) the two bases are written together as a single lexeme and that triggers the deletion of the vowel of the adjective constituent in the noun-adjective nominal compound. In (4b) however, the two forms are considered as a noun phrase. They are written separately and the initial vowel of the adjective is maintained. Also, in (4c), we realize that the initial vowel of right-hand constituent *étɛ̃*

'three' is deleted because the two lexemes are fused into one lexeme. On the other hand, in (4d), the vowel deleted in (4c) is preserved.

Vowel elision is not so prevalent in Dangme compounding because most syllables in the language have CV structure and, this implies that in compounding in Dangme, hiatus, the prerequisite for vowel elision, is not pervasive. Vowel elision cannot therefore be considered as an absolute distinguishing feature of compounds in the language because it is rare and there are exceptions too. In the compound *yīàgbò* 'one who has a big head', the initial vowel of the right-hand constituent, *àgbò* 'big' is not deleted though the preceding word ends with a vowel. Vowel deletion does not occur in Dangme compounds when the two constituents are not written together.

Syntactic impenetrability or inseparability is another means by which compounds may be contrasted with noun phrases in Dangme. Impenetrability or inseparability means that a morphologically complex form that is construed as a compound (as opposed to a phrase) cannot have other element(s) inserted between the two constituents of the compound (cf. Lieber & Štekauer 2009a; Omachonu & Onogu, 2012). This is exemplified in (5).

5. a. Àdwó hé tsũm̀ sɛ́.
Àdwó buy.PST room chair
'Àdwó has bought a room chair'

b. Àdwó hé tsũ̀m sɛ́-hi.
Àdwó buy.PST room chair-PL
'Àdwó has bought room chairs'

In (5b), we observe that *tsũ̀m sɛ́* is marked for plurality and the construction is acceptable. This is because the two constituents are conceptualised as a single unit with a specific referent. In this regard, the two constituents that form the

unit have to be pluralised as a unit (one lexeme). In (6a) below, however, the plural morpheme is marked on the left-hand constituent as *tsũhi* and that renders the construction unacceptable. This suggests therefore that in Dangme, we usually do not find one of the constituents in a compound inflected for plurality; rather, the whole construct, considered as a compound (lexeme) must be marked for plurality as shown in (5b).

Unalterability which is another syntactic criterion for compoundhood deals with the modification of the non-head constituents in nominal compounds. In English, for example, a non-head first constituent of a compound usually does not accept modification, whiles in NPs, modification of the non-head is possible. For example, while it is possible in English to have *a very black board* for NP, it is not acceptable to modify the non-head constituent, *black* in the nominal compound *blackboard.* Thus, whereas *a very black board* is acceptable as a noun phrase, **very blackbird* as a nominal compound is not acceptable (cf. Omachonu & Onogu 2012).

As exemplified in (6b), the nominal compound *tsũm sɛ̃* 'room chair' has the constituent *tsɯ̃̀m* 'room' as a non-head constituent. The construction therefore is unacceptable because we can see the non-head constituent being modified by the adjective *yáyáá* 'bad' as in **tsɯ̃̀m yáyáá sɛ́.*

6. a. *Àdwó hé tsɯ̃̀-hi sɛ́.
Àdwó buy.PST room-PL chair
'Àdwó has bought rooms chair'

b. *Àdwó hé tsɯ̃̀m yáyáá sɛ́.
Àdwó buy.PST. room bad chair
'Àdwó has bought a bad room chair'

Though these criteria (phonological and syntactic) seem useful for distinguishing compounds from NPs and derived complex words, they do not seem to be all that we need to establish the differences between compounds and other structures, including NPs. For example, non-count nouns are not marked for plurality. Hence, plural marking on the head or non-head constituent may not help to determine the compoundhood of such constructions. In other words, the formal properties of nominal compounds discussed so far does not seem reliable in making a distinction between nominal compounds and NPs in Dangme.

3.2.2 Semantic properties of Dangme compounds

A semantic criterion has been proposed to account for the compoundhood of morphological constructs. Nwaozuzu (1991) cited in Omachonu and Onogu (2012) posits that any complement-head structure (eg. N+N combination) that satisfies any three of these four semantic criteria could qualify as a nominal compound (in Ìgbò): (i) unity of concept, (ii) semantic specialization, (iii) permanent aspect, and (iv) unitary representation of concept.

Unity of concept as a semantic criterion in determining compoundhood of structures in Dangme, means that a Dangme compound must denote a single new idea rather than a combination of the ideas borne by the constituents of the structure. Thus, the structure considered as a compound must name a new referent or concept independently from the constituents. Considering the Dangme compounds *mìtɔ̄* ‘someone with pot belly’ [lit. stomach + bottle], *nyɛ̀ ngūā* ‘elderly aunt’ [lit. aunt big] and *tsō kú* ‘fire log’ [lit. wood male], we see that the meanings expressed by the compounds are not completely inherited

from the members of the compounds. The combined constituents of each of the compounds have therefore become one lexeme that denotes something specific.

With semantic specialisation the meanings of the constituents of compound words are not always "directly predictable from the meanings of the constituents because the meanings of these constituents may have depleted through various semantic extensions and associations" (Omachonu & Onogu 2012: 102). A Dangme compound thus consists of a concatenation of words with unique meaning in the language so that it qualifies to be described as lexicalised and semantically specialised. Thus, the specific meanings, denotations or connotations of the compound members may no longer be directly accessible in the compound they form part of. For instance, the noun-adjective compound, *mɑ̀̀tsɛ̄ ngūā* 'great king' [lit. king big] has lexicalised so that the meaning BIG associated with the right-hand constituent is no longer directly accessible in the compound *màtsɛ ngūā* 'great king' in the sense that the right-hand constituent of the compound is not describing the physical size of the left-hand constituent. This is also observed about the compound *yò sàá* 'a barren woman' [lit. woman castrated], where the meaning *castrated* included in the lexeme *sàá* is not directly available in the compound *yò sàá.*

Permanent aspect, as another semantic criterion for determining compoundhood in Dangme, requires that there exist a semantic bond between the components that form the compounds in the language. This bond, according to Omachonu and Onogu, (2012: 103), must "be intimate, irreversible, and permanent and not just a casual association." For instance, in the Dangme compound *sɔ̀lèm̀tsɯ̀̃* 'chapel', the constituent *tsɯ̀̃* 'house' can only refer to a building or house where *sɔ̀lèm* 'worship' is done on regular basīs. In

the same vein, *pókú* ‘root’ in the compound *tsō pókú* ‘tree root’ is a permanent part of the *tsō ‘tree’*.

Unitary representation of concept, as characteristic of compounds in Dangme, means that unlike NPs where the head-word alone can take the place of the entire phrase, none of the elements constituting a compound in Dangme can semantically and wholly stand in for the compound as a single word in the grammar of the language. Thus, compounds that fail the hyponymy test may be used to illustrate this criterion. For instance, in the compound *nɜ̃́négédé* ‘one who has lean legs’, neither *nɜ̃́né* ‘leg’ nor *gédé* ‘lean/thin’ can replace the compound in clauses to encode the same meaning the compound evokes. In examples (7b) and (7c), unlike (7a) we observe that the sentences are ungrammatical because the subject positions are occupied by inanimate arguments.

7. a. Nɜ̃́négédé tù fo.
   Nɜ̃́négédé run.PST race
   ‘Nɜ̃́négédé ran a race’
   b. *Nɜ̃́né tù fõ.
   leg run.PST race
   ‘Leg ran a race’
   c. *Gédé tù fõ.
   thin ran.PST race
   ‘Thin/lean ran a race’

However, the NP *tsō gédé* ‘tree thin’, *tsō* ‘tree’ the head of the NP can occur in place of the NP when the speaker does not intend to describe or modify the head. Similar observation could be made about the compound *làzũ* ‘ash’ [lit.

fire soil] in which the combined lexemes holistically represent the entity the compound names.

From the discussion so far, we have seen that a Dangme compound may be distinguished from derivatives and NPs by syntactic, phonological and semantic criteria. Regarding phonology, I have shown that there are combinations of words that may be considered as compounds but not NPs because in the compound, segments may be deleted, whiles the segment that is deleted in the compound may be preserved in the same combination in NPs. Syntactically, the discussionhas underscored that internal modification, especially of non-head constituents in NPs, is possible; but we cannot modify the non-head constituent in compounds. Semantically, I have shown that Dangme linguistic structure are compounds when they show some of these attributes: unity of concept, semantic specialisation, permenet aspect and unitary representation of concept.

Though these criteria help us to determine compoundhood in Dangme, none of them is adequate in itself. Therefore, we need to combine more than one of these criteria in determining compoundhood of a construction in Dangme.

3.3 Classification of Dangme Compounds.

In this section, I discuss the classification of Dangme compounds. I categorise the compounds in Dangme based on the syntactic category of the constituents of the compounds. The relationships that hold between these constituents are also discussed. I look at the issue of headedness in Dangme compounds and

based on that classify the Dangme compounds into two: endocentric and exocentric.

3.3.1 Classification of Dangme Compound by syntactic category

Compounds are formed by combining words that already exist to form new words. The words that are joined to form a compound may be of the same or different word classes; for instance, noun-noun (N-N), noun-verb (N-V), among other combinations. In terms of syntactic category, there are two dimensions along which compounds are classified. The first dimension is the classification of compounds based on syntactic category of the output. This classification yields classes of compounds which are nouns (nominal compounds), compounds which are verbs (verbal compounds), compounds which are adjectives (adjectival compounds), etc. The other dimension is based on the syntactic category of the constituents. The latter classification distinguishes compounds made up of two nouns (N-N), a noun and a verb (N-V), two verbs (V-V), a noun and an adjective (N-A), an adjective and a noun (A-N), among others.

This section focuses on the various types of compounds that are found in Dangme based on the syntactic category of the constituents. Thus, I look at the categories of words that combine to form the compounds (N-N, N-P and N-A), the category of the compounds and the relations that exist between the compounds and the compound constituents as well as between the compound members themselves.

3.3.1.1 Dangme Noun-Noun (N-N) compounds

If there is anything about compounding that can be confidently claimed to be a near-universal, it is the existence of N-N compounds. Almost every language that has compounding as a word formation process has N-N as one of the categories (cf. Akrofi-Ansah 2012; Andreou 2014; Bauer 2001; Booij 2010; Dolphyne 1988; Omachonu & Onogu 2012; Scalise & Vogel 2010b). N-N compounds are the commonest types of compounds in Dangme. They are formed by combining nouns of various semantic types to form new words. The nouns that form the bases of N-N compounds in Dangme may be concrete (eg., *wē* 'house'*, sàī* 'matress', *tsō* 'stick' *etc*), abstract (*sɔ̀lɛ̀m* 'prayer'*, mű́nyű́* 'speech', etc), animate (eg., *yēlɔ̄* 'glutton', *tsɛ̄* 'father'*, yò* 'woman', etc), inanimate (eg., *dɛ̀̃* 'wine', *wē* 'house'*, kùé* 'hut', etc), mass (eg., *sìklì* 'sugar'*, dɛ̀̃* 'wine'*, zũ* 'soil', *etc*), count (*eg., yò* 'woman'*, mɛ̀̃* 'town', *tsō* 'tree', *etc*) or human relation (eg., *tsɛ̄* 'father'*, bí* 'child'*, nyɛ̀* 'mother', *etc*). N-N compounds in the language are mostly right-headed, hence endocentric. That is, the right-hand constituent of the compound functions as the semantic head, whiles the left-hand member modifies it. Examples of Dangme N-N compounds are presented in Table 5.

The base *àkàté* 'groundnut', for instance, combines with the base *hùényũ* 'soup' to form *àkàténhùényũ* 'groundnut soup'. The left-hand member *àkáté* 'soup' functions as the non-head and modifies the right-hand member which is the head in the compound. The same can be observed in the compound *sɔ̀lɛ̀mtsũ,*'chapel' where the left-hand member of the complex construction, *sɔ̀lɛ̀m* 'church' modifies the right-hand member, *tsũ* 'house'.

Table 5: Dangme N-N compounds

Base 1	Gloss 1	Base 2	Gloss 2	Compound	Translation
tsō	tree	pókú	root	tsōpókú	tree root
gɔ̀	pawpaw	tsō	tree	gɔ̀tsō	pawpaw tree
àkáté	groundnut	hùényũ	soup	àkátéhùényũ	groundnut soup
pàm	river	lò	fish	pàmlò	fish
sɔ̀lem	prayer	tsũ	building	sɔ̀lem tsũ	church building
pà	river	tsō	tree	pàtsō	bridge
sà	matress	tsō	tree	sàtsō	bed
blɛ̀fó	maize	gbà	hut	blɛ̀fó gbà	maize hut
àgbèlì	cassava	bà	leaf	àgbèlìbà	cassava leaf
lā	fire	zũ	soil	lazũ	sandy soil
wɔ́	idol	yò	woman	wɔ̀yò	priestess
lā	fire	tsō	wood	lātɛ́	firewood
mɜ̀	town	tsɛ̄	father	mɜ̀tsɛ̄	king
wɔ́	idol	tsũ	house	wɔ́tsũ	shrine
tɛ́	stone	sà	mat	tɛ́sà	bedrock
mŭ́nyŭ́	speech	yē-lɔ̄	eat-agt	mŭ̀nyŭ̀ yēlɔ̄	judge
lātɛ́	fire stone	kùé	hut	lātɛ́kùé	kitchen
wē	house	sè	back	wēsè	menstruation
yī	head	nyɜ̀	mouth	yīnyɜ̀	forehead
sɪ́klì	sugar	dɜ̀	drink	sìklídɜ̀	mineral drink
nɪ̀́né	hand	ngwɛ́	finger	nɪ̀́né ngwɛ́	finger
mɜ̀tsɛ̄	king	dɜ̀	wine	mɜ̀tsɛ̄ dɜ̀	wine for kings
wē	house	tsɛ̄	father	wētsɛ̄	landlord
bí	child	nyɛ̀	mother	bínyɛ̀	lactating mother

Dangme N-N compounds look like their counterparts in Lɛtɛ (Akrofi-Ansah, 2012), Akan (Appah 2015b) and C'lela, a Kainji language spoken in Nigeria (Aliero 2013). However, while in C'lela N-N compounds the first constituent signifies the meaning of the compound and therefore serves as the semantic head, in Dangme, Lɛtɛ and Akan, the second constituent of N-N compounds rather determines the meaning of the compounds in most cases and therefore serves as the semantic head. Let's compare Dangme N-N compounds to the following examples (8) from Lɛtɛ, Akan and C'lela respectively.

8. Lɛtɛ: sùkúú 'school' + Ø-tsá SG-house' → sùkúútsá 'school building'
(Akrofi-Ansah, 2012)

Akan: àsɔ́ré ‘church’ + dáń ‘building’ → àsɔ́rédáń ‘church building’
(Appah 2015b)

C’lela: d’kàk ‘pancake’ + c’sèn ‘bee’ → kàk d c’sèn ‘beehive’
(Aliero 2013)

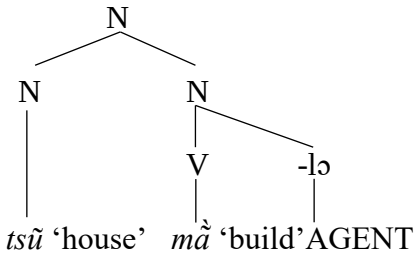
We observe that in Lɛtɛ and Akan, the left-hand members of the N-N compounds, *sùkúú* and *àsɔ́ré* modify their respective right-hand members making them function as modifiers of the right-hand members, the heads of the compounds, *Ø-tsá* and *dáń* respectively. These examples in Lɛtɛ and Akan are consistent with Dangme endocentric N-N compounds as shown in Table 5. The C’lela example, however deviates from the head-modifier order. In the N-N compound, d’kàk c’sèn, *d’kàk,* the left-hand component is the head, while the right-hand member, *c’sèn* serves as the modifier. The C’lela N-N compound is therefore a left-headed endocentric nominal compound; while those of Dangme, like Lɛtɛ and Akan are right-headed.

3.3.1.1.1 Structure of N-N Compound Constituents

The constituents of Dangme N-N compounds may be simplex or complex. A nominal base constituent is considered simplex if the constituent is not derived or itself a compound. Complex bases on the other hand consist of constituents that are derived or compounds. The compounds *àgbèlìtsō* ‘cassava stick’ and *wɔ̀tsũ* ‘shrine’[lit. idol house] are made up of sīmplex constituents, because none of their constituents is a compound or a derived word. Dangme endocentric synthetic compounds are compounds with one of the constituents being a derived complex word. In the compound *tsũ* + *mɛ̃̀-lɔ* ‘mason’ [lit.

house + build-er], we identify the agentive suffix on the right-hand verbal base. The derivation process is shown in (9) below.

9.

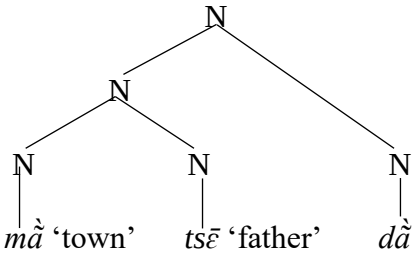


Dangme has limited number of derivational affixes and therefore derivation as a word formation process is not very productive in the language. As a result of this, complex words in the language are usually compounds. It is therefore possible, as found in the data, that some compound constituents are themselves compounds. For examples *mɑ̀̃tsɛ̄dɑ̀̃* [[*mɑ̀̃ + tsɛ̄]*$_N$ + [*dɑ̀̃*]$_N$]$_N$ ‘wine for a king’ and [[sɔ̀lɛ̀m̀+ tsũ̀m̀]$_N$ + [s*ɛ̃*]$_N$]$_N$ ‘chapel seat’ are made up of complex left-hand constituents. This is because the constituents *mɑ̀̃tsɛ̄* ‘king’ and *sɔ̀lɛ̀m̀tsũ̀m̀* ‘church auditorium’ are made up of the bases *mɑ̃* ‘town’ and *tsɛ̄* ‘father’, and *sɔ̀lem* ‘church’ and *tsũm̀* ‘room’ respectively. We may observe from (9) the feature of “recursīvity” of compounds (cf. Plag 2003:134), where the compound constituent *mɑ̀̃tsɛ̄* ‘king’ which is itself a compound combines with *dɑ̀̃* ‘wine’ to form another compound. Though this shows that the constituents of N-N compounds may themselves be compounds, it appears, based on the present data that most of the complex bases are left-hand constituents as shown in (10) below with the compound *mɑ̀̃tsɛ̄dɑ̀̃*.

It has been observed (eg., Plag 2003; Spencer 1991), that recursive compounds may be of any length (a number of compounds), however, to

minimise the difficulty of understanding recursive compounds, speakers need to avoid combining too many words in compounds. We can argue that in Dangme, morphological additions in nominalisations are directed rightwards and the added unit is mostly simplex.

10.



Compounding in Dangme is the most productive nominalisation process and every N-N compound in the language results in a nominal compound, much like what has been noted to be the case in the neighbouring languages, Akan (cf. Appah 2015b; Dolphyne 1988) and Lɛtɛ (cf. Akrofi-Ansah 2012).

3.3.1.1.2 Semantic Relations between the Constituents of N-N Compounds

N-N compounds are very interesting in the sense that they are formed from nouns of varied semantic properties. Though there seems to be some flexibility on the semantic properties of nouns that combine to form N-N compounds (cf. Scalise & Vogel 2010a), there appears to be a particular relation between the constituents. Bauer and Traasova (2013: 2) observe that “though a *sleeping pill* is supposed to encourage sleeping, a *sea-sickness pill* is not supposed to encourage sea-sickness”. They noted about the compounds *firehouse, framehouse, glasshouse, henhouse, and townhouse* that different relations are exhibited between the left-hand constituent of the compounds and *house,* the element that fills the right-hand position.

Considering the example *library book*, Bauer and Tarasova (2013) view the semantic relation between the constituents of N-N compounds in the light of the statement from Guevara & Scalise (2009: 108) that a compound is defined as being of the structure [X ℜ Y]Z where *X, Y* and *Z* are labels for major syntactic categories and ℜ represents an implicit relationship between them. Thus, in order to interpret any compound the nature of ℜ for that particular compound needs to be ascertained. Since ℜ is not explicit, we need to reconstruct this missing semantic information that ℜ represents in order to adequately interpret any given compound. In doing so, one may reconstruct ℜ, as library CONTAIN book in order to interpret *library book* as a compound word (Bauer & Tarasova 2013).

The relation between elements in N-N compounds sometimes requires pragmatics to ensure their full interpretation. As Bauer & Tarasova (2013: 3) observe, "the morphosyntactic structure provides minimal semantic information (compatible with all compounds); most information on interpretation comes from the context of use." Thus, in order to interpret N-N compounds, we need to identify the semantic information that is available in the constituents and the morphosyntactic structure in which they occur (Bauer 1979).

Dangme N-N compounds are not different from what has been observed in English (cf. Bauer & Tarasova 2013). In Dangme N-N compounds, the modifyīng constituents have meaning relation with their head constituents. This relation, however, occurs when the compound is endocentric. In exocentric N-N compounds, however, the constructions may have different constraints holding between the constituents and this limits their relation as compound

constituents (cf. Bauer & Tarasova 2013). For instance, in the compound *àkòtó hɛ́gmɛ́* 'jagger bush' [lit. Akoto eye], because the construction limits the relation between *àkòtó* and *hɛ́gmɛ́,* the interpretation of the compound as 'the eye of Àkòtó' is constrained.

The relation that exist between the nominal constituents of an N-N compound is linked with the lexico-grammatical characteristics of the nouns. This relation appears to be recurrent in different endocentric N-N compounds in the language to establish the fact that constituents of Dangme N-N compounds are related. The different relations existing between the constituents of Dangme N-N compounds, as shown in Table 6, reflect the dependency of the constituents on each other.

The relations, as shown in Table 6 below, include 'aspect of', 'ingredient of', 'part of', 'nature of' etc. For instance, in the compound *àkátéhúényũ* 'groundnut soup', the constituent *àkáté* 'groundnut' is the ingredient of *húényũ* 'soup'. The same relation can be said to exist between *síklí* 'sugar' and *dɛ̀̃* 'wine' in the compound *síklí dɛ̀̃* 'soft drink' [lit. sugar + wine] where *síklí* is construed as the ingredient for making *dɛ̀̃.* Other examples with this kind of relation include *wíé- húényũ* 'palm nut soup' and *bàtsīpã* 'herbal medicine'.

Table 6: Relations between Dangme N-N compounds

Base	Relation	Base	Example	Translation
N1	INGREDIENT FOR	N2	àkáté-húényũ	groundnut soup
N1	LOCATION OF	N2	tsũm-sɛ̃	room chair
N2	PART OF	N1	brɔ̄-nyɛ̀̃	junction
N2	MADE FOR	N1	blɛ̀fó-gbà	maize barn
N1	CAUSED	N2	la-zũ,	ash
N2	MAKES	N1	jé-bɔ̀lɔ̄	creator of the unverse
N2	USED FOR CROSSING	N1	pà-tsō	bridge
N2	NATURE OF	N1	zíá-zũ	sandy soil

Conflated relations are sometimes observed between constituents as shown in (11).

11. a. Àdwó sṹɔ̏ síklì dȁ
Àdwó like sugar drink
'Àdwó likes mineral drink'

b. Àdwó hòó *àkáté* *hùényũ̃.*
Àdwó cook.PST groundnut soup
'Àdwó cooked groundnut soup'

In example (11), the left-hand constituents are not just ingredients but also properties of the right-hand constituents. The 'ingredient for' relation between the constituent of *àkáté hùényũ̃* 'groundnut soup' instantiates the schema in (12).

12. < [[N]$_i$ [N]$_j$]$_{Nk}$ ↔ [SEM$_i$ *is ingredient for* SEM$_j$]$_k$ >

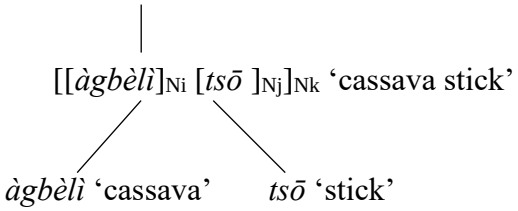
[[*àkáté*]$_{Ni}$ [*húényũ̃*]$_{Nj}$]$_{Nk}$ [àkáté$_i$ is ingredient for húényũ̃$_j$]$_k$

àkáté 'groundnut' *hùényũ̃* 'soup'

Another relation that is revealed between the constituents of N-N compounds in Dangme is 'part of' relation. This is observable in the compounds *brɔ̄nyã̄* 'roadsīde' [lit. road mouth] from the constituents *brɔ̄* 'road/path' and *nyȁ* 'mouth'. The compound has the constituent *nyȁ* 'mouth' which is part of *brɔ̄* 'path/road'. The right-hand constituents of N-N compounds that exhibit this kind of relation are considered part of the referent of the left-hand constituent (part of a whole). The same relationship exists between the constituents *àgbèli* 'cassava' and *tsō* 'tree' in the compound *àgbèlìtsō* 'cassava stick' where *tsō* is

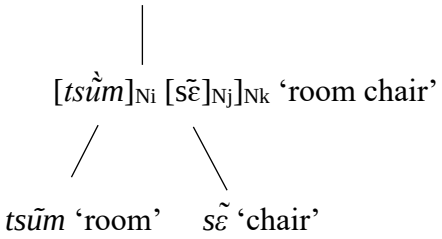
part of *àgbèlì*. 'Part of' relation is captured in (13) with the compound *àgbèlìtsō*.

13. $< [[N]_i\ [N]_j]_{Nk} \leftrightarrow [SEM_j\ \textit{is part of}\ SEM_i]_k >$



'Location of', is another relation that can be observed between the constituents of N-N compounds in Dangme. For instance, the referents of the left-hand constituents of the compounds *tsǔ̀m̀sɛ́* 'room chair' and *pàm̀lò* 'fish' [lit. river meat] describe the location of the right-hand constituents, *sɛ́* 'chair' and *lò*[1] 'meat' respectively. Thus, *sɛ́* 'chair' is located in *tsǔ̀m̀* 'room', while *lò* 'meat' is also located in *pàm̀* 'river'. The 'location of' relation is shown in (14) below with the compound *tsũ̀m sɛ̃*

14. $< [[N]_i\ [N]_j]_{Nk} \leftrightarrow [SEM_j\ \textit{located at}\ SEM_i]]k >$



'Used for' relation can also be observed between some constituents of Dangme N-N compounds. This is revealed when one of the constituents names the

[1] Dangme does not have separate lexemes for fish and meat. They are both called *lò.* To distinguish them, *pàm* 'river inside' or *de* 'hunting' or the name of the animal whose meat is implied is mentioned to qualify *lò*

entity that is used for doing something related to the left-hand constituent. For instance, in the compound *pà-tsō* ‘wooden bridge for crossing streams’ [lit. river tree], we may realise that *tsō ‘tree’* is used for crossing *pà* ‘river’. This relation cannot be seen in the compound *àgbèlì-tsō* ‘cassava stick’ where the stick of the cassava is part of the whole cassava which comprises the leaves, branches, stems and root, therefore *tsō* is in a ‘part of’ relation with *àgbèlì*. There may be trees at the bank of the river, but these are not called *pàtsō because* they are not used for crossing the river. ‘Used for’ relation is captured in (15) with the compound *pàtsō*.

15. $< [[N]_i\ [N]_j]_{Nk} \leftrightarrow [SEM_j$ *used for crossing* $SEM_i]_k >$

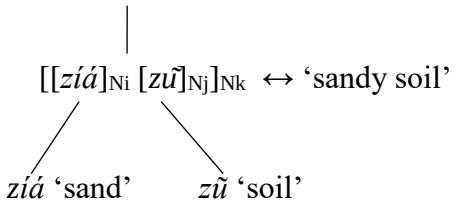
$[[pà]_{Ni}\ [tsō\ ]_{Nj}]_{Nk} \leftrightarrow$ ‘wooden bridge’

pà ‘river’ *tsō* ‘tree’

‘Property of’ relation is yet another relation observable between the constituents of Dangme N-N compounds. This relation occurs when the left-hand constituent of the compound exhibits attributive function by ascribing to the right-hand constituent some of it salient core semantic properties. Considering the compound *zíà-zũ* ‘sandy soil’ for instance, *zũ* ‘soil’ is understood to have the property of *zíà* ‘sand’ which is the left-hand constituent of the compound. Another compound that exhibits this kind of relation is *ngònyũ* ‘salty soup’ [lit. salt water], where soup, with salt as one of its ingredients, is described as having too much of the property of salt. ‘Property

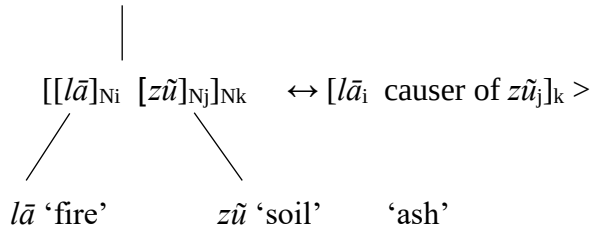
of' relation is instantiated in the schema (16) with the compound *zíázṹ*, where *zũ̀* 'soil' contains too much property of *zíà* 'sand'.

16. $< [[N]_i\ [N]_j]_{Nk} \leftrightarrow [SEM_j$ *contains too much of* $SEM_i]_k >$



Property of relation as seen in (16) can be contrasted with the relation existing between the constituents of the compound *lāzṹ* 'ash' [lit. fire soil] in which the left-hand constituent *lā* 'fire' does not ascribe its property to *zṹ* 'soil' but rather understood as the causer of *zṹ* 'soil'. The 'causer' relation is illustrated in schema (17) with the compound *lazṹ* 'ash'

17. $< [[N]_i\ [N]_j]_{Nk} \leftrightarrow [SEM_i$ *causer of* $SEM_j]_k >$



The relations between constituents of Dangme N-N compounds, as explained provides us insīght into understanding compounds. The relations holding between the constituents guide us in ascertaining the possible nouns that we combine to form compounds in the language. The interpretation of the relationship between the constituents may be subject to pragmatic interpretation and to some extent the individual nouns involved or their

semantic information may be required in determining the more precise relationship that exists between a given set of compound constituents.

This section has looked at N-N compounds in Dangme. It has been shown that the constituents of N-N compounds are of various semantic types, including concrete, abstract, animate, mass and human relation. Though the constituents of the N-N compounds may be of different semantic types, a particular relation exists between them. The relations existing between N-N compound constituents include 'location of' (eg. Pàmlò 'fish' [lit. river inside+ meat], 'used for' (eg.*pàtsō 'wooden* bridge' [lit. river + tree] and 'part of' (eg. *brɔ̄nyã̀* 'roadside' [lit. road + mouth].

The left-hand members of the N-N compound usually have attributive function, modifying the right-hand constituent, which is the semantic head of the compound.

3.3.1.2 Noun-postposition (N-P) compounds in Dangme

Another class of Dangme compounds is the one that consists of a noun and postposition. Hevi, (2011) discussing aspects of Dangme morphology, treats words such as *no* 'top'*, sè* 'back', *he* side', etc as postpositions and, therefore, classifies compounds they form constituents of as noun-postposition compounds. This is not too surprising though, as earlier works on Akan (Christaller 1875), Ewe (Duthie 1988) and Gã (Dakubu 1988) treat this category of words which express spatio-temporal and locative concepts as postpositions. This notwithstanding, Balmer and Grant (1929:54) cited in Osam et al. (2011: 2) state about the so called postpositions in Fante, a dialect of Akan that:

> In Fante there are no prepositions exactly corresponding to those in English. The words used as equivalents of prepositions are either nouns or verbs. ... it may be said that prepositions are particles that have become worn down from larger words which were once fuller and more concrete in meaning, such as nouns are.

Taking a similar view, Welmers (1946:53) cited in Osam et al. (2011: 2) refers to the Fante forms *mu* 'inside', *dó* 'top', *àsé* 'bottom', *ǹkyéǹ* 'side' *ànyímǹ* 'front' *èkyír̀* 'back', *hó* 'side/ body' as nouns.

Apronti (1972:1) commenting on the inappropriate description of these Dangme and Ga words as postposition stresses the influence of translation equivalents in usage by pointing out that:

> The word-class POSTPOSITION appears to me to fit uncomfortably into the description of some languages I know of to which it is applied. It is true that where it is applied, it is meant in some sense to reflect a distant affinity to the more familiar PREPOSITION. But even this affinity may turn out to be a false one, based as it is on translation equivalents rather than on structural evidence
>
> (Apronti 1972:1 cited in Osam et. al. 2011).

To Apronti, therefore, it appears more appropriate to consider these so-called postpositions as nouns. Though this work is not attempting to take a stand and defend it, as that will go beyond the scope of this work, I have decided to keep

their category as postposition. This is because in the data, they seem to function as postpositions and nouns. Following the argumentation of Osam et al. (2011) about this category of words in Akan, we would consider them to have developed from nouns through grammaticalization, where both lexical words diverge functionally without any change in their forms. I have therefore decided to call compounds formed with these relator nouns as noun-postposition compounds (N-P). Table 7 captures some examples of N-P compounds in Dangme.

Table 7: Table 4: Dangme N-P compounds

Base 1	**Gloss**	**Base 2**	**Gloss**	**Compound**	**Meaning**
pà	river	nõ	top	pànõ	river top
pà	river	mì	inside	pàmì	insideriver
tsō	tree	nõ	top	tsō nõ	tree top
pà	river	sè	back	pàsè	river back
yī	head	nyɛ̃	mouth	yīnyɛ̃	fore head
fɔ̀m	birth	sè	back	fɔ̀msè	placenta
nɛ̃né	leg	sī	under	nɛ̃nésī	sole
tsũ	house	mì	inside	tsɔ̃̀m	room
kpō	outside	nõ	top	kponõ	compound
Pà	river	túé	ear	pãtùé	riverside
mɛ̃	town	nyɛ̃	mouth	mɛ̃nyɛ̃	suburb
tsō	tree	kɔ̃	branch	tsō kɔ́	tree branch

3.3.1.2.1 Characteristics of Dangme N-P compounds

As indicated, the right-hand constituents of the N-P compounds express location and physical space. Structurally, these forms are mono-syllabic and usually consist of not more than three-letter words. These words are somehow different from prototypical nouns because they cannot be inflected for number as the following examples illustrate: * *nyɛ̀hi, *sèhi, *túéhi, *hɛ́hi, *nõhi*. These words do not take plural markers because, they are conceptualised as singular. Thus, their property of being body part nouns makes them to be perceived as

singular since each individual or entity that these relator nouns are associated with cannot have more than one of them. Though *túé* 'ear' and *hɛ̃́* 'eye' are two, they are conceptualised as one because they are used simultaneously.

Another feature of this category of words is that they tend to occur at the possessum slot of genitive constructions. This makes them behave like nouns. For instance, in the examples in (18b), (18d) and (18e), the forms *nõ, sè* and *nyɛ̃̀* can be interpreted as possessed nouns.

18. a. Àdwó lē mɛ̃̀-hi à-bíɛ́.
Àdwó know town-PL 3POSS-name
'Àdwó knows names of towns'

b. Àdwó yà pà-nõ.
Àdwó go.PST river-top
'Àdwó went fishing (on the river)'

c. Àdwó yà pà.
Àdwó go.PST river
'Àdwó fetched water from the stream'

d. Àdwó yà wē-sè.
Àdwó go.PERF house back
'Àdwó menstrated'

e. Àdwó yà pà-nyɛ̃̀.
Àdwó go.PERF river-mouth
'Àdwó went to the riverside'

Another feature these words exhibit, at least as they appear in the data set, is that they usually don't carry their primary meaning into the compounds they form constituents of. In example (18b) and (18e), we observe that the words have different metonymical interpretation. That is, while *pà-nõ* in (18b) means

fishing and not just on top of a river, (18e) means barter trading of fish by the river side.

Considering the relator nouns *túé* ‘ear’, *nyɜ̀̃* ‘mouth’ and *hɛ́̃* ‘face’ in the compounds *pàtúé* ‘river bank’, *pànyɜ̀̃* ‘riversdie’, *nyúhɛ̃* ‘face of water’, we observe that these body part nouns (*túé* ‘ear’, *nyɜ̀̃* ‘mouth’ and *hɛ́̃* ‘eye’) are not in a part-whole relationship or directly associated with inanimate nouns they combine with, but because they don’t maintain their core semantic properties, we see them combining with these nouns. To understand these compounds, therefore, requires that one interprets the right-hand constituents metaphorically.

On the relation between the constituents of Dangme N-P compounds, one can observe that of ‘part-whole’, where the right-hand constituent can be assumed to be part of the left-hand constituent. Thus, *túé* ‘ear’ is part of *mɜ̀̃,* and *nyɜ̀̃* ‘mouth’ is part of *pà* ‘river’. This relation is illustrated in (19) below.

19. $< [[N]_i\ [N]_j]_{Nk} \leftrightarrow [SEM_j \text{ part of } SEM_i]_k >$

$< [[pà]_{Ni}\ [nyã]_{Nj}]_{Nk} \leftrightarrow [nyã_j \textit{ being part of } pà]_k >$

pà ‘river’ *nyɜ̀̃* ‘mouth’ > ‘edge of a river’

The part-whole relation between the constituents of Dangme N-P compounds may be bound, where the constituents are physically attached, as in the compound *glɛ̀̃nyɜ̀̃* ‘edge of a wall’ [lit. wall mouth] or be detached as in the compound *pàsè* ‘back of a river’ [lit. river back] and *wēsè* ‘menstruation’ [lit. house back] where *sè* ‘back’ is not directly part of the left-hand constituents *pà* ‘river’ and *wē* ‘house’ respectively.

The question that arises from these compounds, as shown in Table 4 is which constituent of the compound can be considered as the head? While some of them, like N-N compounds, are endocentric, others are exocentric. Considering the compounds with *nyɜ̀* 'mouth' as the right-hand constituent such as *glɛ̀nyɜ̀* 'edge of a wall', *wenyɜ̀ '*around the house'*, mɜ̀nyɜ̀* 'around the town' and *tsũnyɜ̀* 'entrance of a house', we can argue that the left-hand constituents modify the right-hand constituent *nyɜ̀* 'mouth' and thereby establishes the compounds as types of *nyɜ̀* 'mouth'. The right-hand constituents must be interpreted metaphorically in order for their endocentric interpretation to prevail.

These compounds are exocentric because they fail the hyponymy test and thereby do not constitute subtypes of the denotation of either of their constituents. Examples of N-P compounds in Dangme that are semantically exocentric include *pànyɜ̀* 'barter trading at bank of a river' [lit. river edge] *wēsè* 'menstruation' [lit. house back]. In these two examples, the meanings of the compounds appear to encode the activities that take place at the location named by the compositional meaning of the compound and not the location per se. consider the examples in (20).

20. a. Kòfí yà pà-nyɜ̀ hìɛ̃.
    Kòfí go.PST river-mouth yesterday
    'Kòfí went to the riverside to exchange fish'
    b. Mɜ̀mí ɛ̄ kpá wē-sè yàṁ.
    woman DEF stop house-back going
    'The woman has stopped menstruating'

The literal meaning of example (20a) is 'the woman went to the riverside yesterday'. However, as this meaning is implied, the addressee takes it for granted or assumes it to be a background information and then moves on to present the implicit meaning rather. Again, though the sentence in (20a) means the woman went to the riverside, the activity of exchanging fish is more crucial as far as the meaning of the sentence in concerned. Since the activity of exchanging fish occurs at the location denoted by the compositional meaning of the compound, we would assume that the meaning of the complex word *pànyɑ̀̃* 'riverside' has broadened metonymically to encompass the activities that go on at that place. Hence anytime the word *pànyɑ̀̃* is mentioned, the activity of exchanging fish is evoked in the mind of the interlocutors. In other words their meanings are not always compositional; sometimes, they are totally idiosyncratic like the case of *wesè* 'menstruation'.

The meanings of compounds the *pànyɑ̀̃* and *wesè* help us to explain the assertion that compounds in general are subject to semantic drift which may include metonymy and metaphor (Ajiboye 2014; Fabb 2001). The compounds *pànyɑ̀̃* and *wēsè*, as well as most of the N-P compounds, may be described as metaphorical exocentric compounds, which according to Bauer (2010b) arise when a compound fails the hyponymy test because the head element or the compound as a whole has a metaphorical interpretation such as is observable in the English compounds *dust bowl* 'an area with no vegetation' and *catlick* 'quick wash' or when the head or the whole compound has metonymic interpretation as in the case of the compound *phone neck* 'pain in the neck caused by using a phone', or the whole compound is metonymic (cf. Appah 2016b).

The interpretation of the compound *wēsè* ‘menstruation’ [lit. house back] is similar to that of *pãnyɑ̃̀*. The meaning of *wēsè* is not the back of the house but rather what is done at the back of the house, the activity. Thus, the compound has to be interpreted metonymically to refer to the activity that is carried out at the location (the compositional meaning) of the compound.

The metonymic interpretation of Dangme N-P compounds is illustrated in (21) below with the compound *wēsè.*

21. $< [[N]_i \ [P]_j]_{Nk} \ \leftrightarrow \ [SEM]_k >$

$< [[wē\ ]_{Ni} \ [sè]_{Nj}]_{Nk} \leftrightarrow [Activity_Z \textit{ that occurs at } [SEM_k] >$

wē ‘house’ *sè* ‘back’ → ‘menstruation’

3.3.1.3 Dangme noun-adjective (N-A) compounds

Schlücker and Hüning (2009) note that although there is unambiguous formal difference between compounds and phrases no distinction can be drawn between them in terms of their semantics and pragmatics. They argue that neither semantics nor pragmatics can be a determining factor, whether a given A+N combination is a compound or phrase in German. Concerning the structure of N-A compounds, Appah (2016c) has noted that N-A compounds in Akan have constituents that are usually simplex, without any restriction on the semantic type of both the noun and adjective constituents, though there is a relation between them. He observes further that N-A compounds in Akan do not have a straightforward interpretation as the adjective constituents sometimes lose their core meaning.

Compounds consisting of nouns and adjectives have been discussed considerably in the literature, with the main concerns of the researchers being the nature of the modification relation between the constituents of the compounds (cf. Appah 2016c) and the nature of the morphology-syntax interface (cf. Giegerich 2005). The latter concern is about how to distinguish between N-A compounds and noun-adjective phrases. N-A compounds in Dangme are either endocentric left-headed or exocentric. The endocentric N-A compounds in Dangme deviate from what is universally preferred, where most endocentric compounds are expected to have their right-hand constituents as heads. Considering the compound *zũ tsū* 'red soil' [lit. soil red], the left-hand element *zũ* serves as the semantic head of the compound because it encodes the core meaning of the compound as a whole. Table 8 below exemplifies of N-A compounds in Dangme.

Table 8: Dangme N-A Compounds

Base 1	**Gloss**	**Base 2**	**Gloss**	**Compound**	**Meaning**
zũ	soil	tsu	red	zũtsu	red soil
tò	sheep	kú	male	tòkú	ram
nyɛ̀	mother	ngūā	big	nyɛ̀ngūā	elderly auntie
tsɛ̄	father	wayó	small	tsɛwayó	younger uncle
mǎ	town	mómó	old	mǎmómó	old town
lólé	vehicle	éhé	new	lóléhé	new vehicle
mìmì	stomach	àgbò	big	mìmì àgbò	pot belly
nyǎ	mouth	píɔ̃	pointed	nyǎpíɔ̃	protruded mouth
tàdé	dress	éhíɔ́	white	tàdéhíɔ́	white dress
nǎné	leg	gédé	slim	nǎnégédé	small legged
nítsúlɔ	worker	nɔ̀kɔ́tɔ́mǎ	old	nítsúlɔ̄ nɔ̀kɔ́tɔ́mǎ	senior worker (director)
mǎtsɛ̄	king	ngūā	big	mǎtsɛ̄ngūā	great king
nyǎdālɔ̄	leader	nítsɛ̄	good	nyǎdālɔ̄ní tsɛ̄	good leader

The second constituent, *tsu* ‘red’ on the other hand occurs to modify the semantic head. Per the data, all endocentric N-A compounds in Dangme are left-headed. Thus, the compounds are hyponyms of the left-hand hand constituents.

Like N-A compounds in Akan (cf. Appah 2016c), the modifier role in the compounds is performed by underived adjectives of different semantic properties. Dangme N-A compounds are not different in this regard. This is because the adjectives tend not to be ascriptive in Dangme N-A compounds. They often do not encode actual properties of the nouns they modify. This is consistent with the observation about Danish A-N compounds (e.g. *hvid-vin* ‘white wine’) in which the “modifying adjectives always have a classifying function rather than the function of a genuine attributive modifier.” (Bauer 2009a: 403).

Discussing why the German compound *Rotwein* ‘red wine’ could be the name of a kind of wine that is not necessarily red, Spencer (2011: 503) maintains that the adjective *red* is not actually in the compound *red wine* because it does not contain its meaning. Making a similar observation about the compound *blackbird*, Plag (2003: 151) argues that “stating that *X is a blackbird* does not imply that the particular bird is indeed black.” In consonance with the argument of Spencer (2011) and Plag (2003), the Dangme N-A compound *mɔ̀̌tsɛ̄ ngūā* ‘great king’ [lit. king big] is not a king who is big or large as the adjective *ngūā* ‘big’ in a NP will ascribe to the head noun.

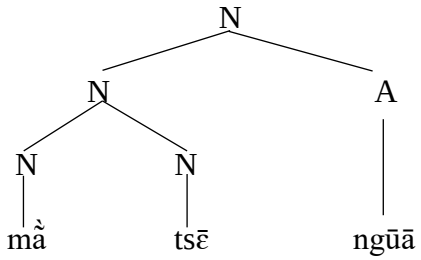
Following the suggestion of Spencer (2011: 501), we would have to assume therefore that some N-A compounds in Dangme are ‘semantically opaque’. This view of the semantics of Dangme N-A compounds implies that

relying on compositionality to interpret these N-A compounds in Dangme is sometimes problematic. As argued about compounds in general "it seems rare that we can say that the meaning of a compound is determined by the meanings of its constituents. At best, constituent semantics enable good guesses at the whole word meaning" (Libben 2014: 22). In the compoun*d nyɛ̀ ngūā* 'elderly aunt' [lit. mother big], the adjective *ngūā* 'big' is not describing the size of *nyɛ̀* 'mother' but the age. The interpretation of Dangme N-A compounds is therefore not completely straightforward, because the adjective members of the compounds may sometimes not preserve their pure adjectival meaning in the compounds.

3.3.1.3.1 The constituents of Dangme N-A compounds

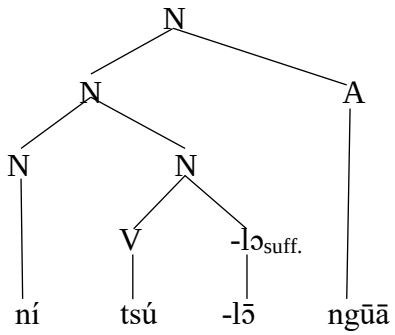
Appah (2016c) observes about Akan N-A compounds that their noun constituents are mostly simplex nouns. This observation about N-A compounds in Akan is true about those in Dangme. Though there are some nominal constituents of Dangme N-A compounds that are derived such as *nítsúlɔ̄ nɔ̀kɔ́tɔ́mà* 'director of a company' [lit. worker old], most of the nominal constituents are simplex as shown in Table 5. Owing to the fact that compounding is a very productive word formation process in the Kwa phylum (cf. Akrofi-Ansah 2012; Appah 2013; Omachonu & Onogu 2012), Appah (2013b) posits that it is not exceptional to find constituents of compounds in these languages being themselves compounds (cf. Spencer 1991). The Dangme compound *màtsɛ̄ ngūā* 'great king' for instance, we see the left-hand constituent, *màtsɛ̄* 'king' being a compound, *mà* 'town' and *tsɛ̄* 'father'. The derivation is captured (22) below.

22.



Though Dangme morphology does not show much of agglutination, there are examples of N-A compounds that have derived nominal constituents. These nouns contain the agentive suffix *-lɔ̄*. This is observable in the compound *nítsúlɔ̄ ngūā* ‘director’ [lit. worker big]. In this compound, the nominal left-hand constituent is a synthetic compound as captured in (23).

23.



The left-hand nominal constituents of Dangme N-A compounds are not inflected for plurality. For instance, if we attempt to inflect *mà̰* ‘town’ in the compound *mà̰ mómó* ‘old town’ for plurality, the word becomes unacceptable as in **mà̰hi mómó*. This confirms the general characteristic about compounds, that internal modification is usually unacceptable.

Unlike the noun counterparts in which some are complex, all the adjective constituents of N-A compounds in Dangme are simplex. They are neither compounds nor derived words. However, they vary in their semantic

types. They express semantic properties such as value (eg., *nɪ̀ttsɛ̄* 'good'), dimension (eg., *ngūā* 'large'), colour (eg., *tsū* 'red') and physical property (eg., *gbígblí* 'dried').

Appah (2016c) notes about N-A compounds in Akan that the noun and the adjective constituents exhibit some semantic relation between them. This observation holds for Dangme N-A compounds as well. For instance, a dimensional adjective needs to combine with a noun that has dimension in appropriate sense. Thus, while *nyɛ̀̃ ngūā* [lit. mother big], *tsō gbígblí* [lit. tree dried] and *zũtsu* [lit. soil red] are possible N-A compounds in Dangme, **mɑ̀̃gbígblí* [lit. town dried], **mɑ̀̃ tsu* [lit. town red] and **zũ ngūā* [lit. soil big] do not seem to be acceptable N-A compounds in Dangme.

3.3.1.3.2 Interpretation Dangme N-A compounds

Based on their interpretation, Appah (2016c) identifies transparent and lexicalised N-A compounds in Akan. A transparent N-A compound is the one in which the compound is usually in a hyponymy relation with the nominal head constituents and the adjective constituents merely express the actual property of the head nouns. Transparent N-A compounds in Dangme include lɔ̀lèhè 'new car', *juɛ̃̀m kpákpá* 'good intension', *tsō ngūā* 'big tree' and *mɑ̀̃ mómó* 'old town'. In these N-A compounds, the meanings of the whole compounds may be worked out from the meanings of the constituents. That is *tsō àgbò* 'big tree' is a kind of *tsō* 'tree' that is *àgbò* 'big', and *jùɛ̃m kpákpá* 'good intension' is a kind of *juɛ̃m* 'intension' that is *kpákpá* 'good'. The adjective constituents of the compounds in transparent N-A compounds retain their core semantic properties (cf. Appah 2016c).

Dangme endocentric N-A compounds are left-headed and instantiate the schema in (24). The relationship between the constructional schema and the compound *tsō ngūā* ‘big tree’ is shown in (24).

24. $< [[N]_i\ [A]_j]_{Nk} \leftrightarrow [SEM_i \text{ which has } PROPERTY_j]_k >$

$[[tsō]_{Ni}\ [ngūā]_{Aj}]_{Nk} \leftrightarrow [\text{tsō}_{\ i} \text{ which has the PROPERTY of } \text{ngūā}_j]_k$

tsō ‘tree’ *ngūā* ‘big’ ‘big tree’

Dangme transparent N-A compounds, like their counterparts in Akan (cf. Appah 2016c), are left-headed semantically. For instance, in the compound *tsō ngūā* [tree-big] ‘big tree’ the constituent *tsō* ‘tree’, the left-hand nominal, is the semantic head. The class of elements denoted by N-A compound are subsets of the class of elements denoted by the heads of these compounds (cf. Scalise & Guevara 2006: 190). These compounds are therefore endocentric N-A compounds. Considering the compounds *zũtsū* [zũ ‘soil’+ *tsu* ‘red’] ‘red soil’ and *mɜ̀ ngūā* [*mɜ̀* ‘town’ + *ngūā* ‘big] ‘city’, we can observe that the meanings of the compounds are the subtypes of the referents of the left-hand members. Endocentric N-A compounds are captured in schema (25) below with the compound *zũtsū*

25. $< [[N]_i\ [A]_j]_{Nk} \leftrightarrow [SEM_i \text{ is } SEM_j]_k >$

$< [[zũ\ ]_{Ni}[tsū]_{Aj}]_{Nk} \leftrightarrow [SEM_i\ \textit{which has property}_j\ ]_k >$

zũ ‘soil’ *tsū* ‘red’ > ‘red soil’

Lexicalised N-A compounds, according to Appah (2016c), are compounds whose meanings cannot be fully worked out from the meanings of their constituents. He notes that some of the adjective constituents in these compounds do not retain their core meanings in the compounds and this makes such compounds somehow opaque. Some Dangme N-A compounds fit into the category Appah (2016c) calls lexicalised type because they have meanings that are not absolutely transparent. For example, the adjective *ngūā* 'big' cannot be interpreted literally in the compounds *màtsɛ̄ ngūā* 'a type of king' [lit. king big] and *nyɛ̀̃ ngūā* 'elderly aunt' [lit. mother big] because these compounds do not mean the kind of king who is big in sīze and the kind of mother who is big in sīze respectively as the compound *tsō ngūā* 'big tree' and *mɛ̀̃ ngūā* 'city' evoke. *Mɛ̀̃tsɛ-ngūā* then has to be metaphorically interpreted to evoke the sense of a 'great king'. The meaning of *big* is not in the compound whose literal meaning is 'big king'. Rather, the adjectives *ngūā* 'big' has a classifying function (cf. Spencer 2011).

Also, a compound's meaning may not be fully transparent because it contains some meaning components that do not emanate from its constituents (cf. Appah 2016; Spencer 2011). Appah (2016c) observes that for each lexicalised N-A compound in Akan, the form has to be mapped directly onto the corresponding meaning. This applies to lexicalised N-A compounds in Dangme as well. For instance, for the interpretation of the compound *nyɛ̀̃ ngūā* 'elderly aunt' [lit. mother big] as a kind of 'mother who is older than one's mother' to be evoked, the form must be directly paired with the meaning component of the entire construction. We may observe that, none of the

constituents contains the meanings *age* and *comparative,* yet these meanings are conveyed in the compound as constructional properties.

Comparing *nyɛ̀̃-ngūā* 'elderly aunt' [lit. mother big] to the compound *mɑ̀̀tsɛ ngūā* 'great king' [lit. king big] which evokes metaphorically, the meaning *a king who is very powerful and or rules a large kingdom,* we can observe that though *ngūā* 'big*'* occurs in both constructions, the kinds of meanings these compounds evoke, though the form of the adjective right-hand constituent is the same, are idiosyncratic. This explains the idea of holistic property of morphological constructions (Appah, 2013b; Booij 2010, 2016; Goldberg 2006). Thus, though these compounds pass the hyponymy test by being types of their left-hand constituents, there are some meaning components that are purely constructional in nature.

Unlike *nyɛ̀ ngūā* and *mɑ̀̀tsɛ̄ ngūā* which are lexicalised, but pass the hyponymy test, there are other N-A compounds in Dangme such as *nɑ̀̃négédé* [lit. *nɑ̀̃né* 'leg' + *gédé* 'slim'] 'someone with lean legs' and *mìmì àgbò* [lit. stomach big] 'someone with pot belly' that are exocentric. The referent of *nɑ̀̃négédé,* for instance, is neither a type of *nɑ̀̃né* 'leg' nor a type of *gédé* 'thin'; rather, 'someone who has thin legs'. The schema in (26) illustrates this with the compound *nɑ̀̃négédé.*

26. $< [[N]_i\ [A]_j]_{Nk} \leftrightarrow [SEM]_k >$

$< [[$*nɑ̀̃né*$]_i\ [$*gédé*$]_j]_{Nk} \leftrightarrow [\text{possessor } [SEM\tilde{}_k]_k >$

nɑ̀̃né 'leg' *gédé* 'thin' > 'one who has thin legs'

On the discussion of N-A compounds in Dangme it has been clear that while the noun constituents may be complex, either compounds or derived, the adjective constituents are always simplex. It has been noted that both the noun and the adjective constituents of Dangme N-A compounds are of varied sematic types.

Concerning the interpretation of N-A compounds, transparent and lexicalised types have been observed based on Appah (2016c). The interpretation of the transparent type of N-A compounds, as I have shown, is quite direct as they tend to be compositional. On the other hand, the lexicalized types have to be interpreted by means of metaphor or metonymy because the adjectival constituents of the compounds may not preserve their core meanings, or there may be some additional meaning components that are not in the constituents and therefore demands that the compound be interpreted holistically.

3.4 Chapter Summary

Though compounding is adjudged to be a universal linguistic phenomenon, the lack of universally acceptable criteria for determining what a compound is across languages has made compounding a language-specific phenomenon so that what establishes a morphological construct as a compound in one language may not apply in another. Hence this chapter has focused on how to determine compoundhood and the types of compounds in Dangme. I have presented the nature and characteristics of compounds in Dangme and have analysed what constitute a compound in the language by differentiating compounds from other structures like NPs and affix-derived complex words. It has been

observed that whereas vowel deletion is possible in compounds, it does not take place in NPs.

Also, with relevant examples, I have illustrated that non-head modification is possible in Dangme phrases but not in compounds. Concerning how to distinguish between derived complex words and compounds, I have argued that Dangme derived complex words have the agentive suffix *-lɔ̄* and the clitic form *-m* of the relator noun *mì* 'inside'. I have argued that semantic criterion helps better than formal criteria since the attested formal properties of Dangme compounds such as vowel deletion and non-head modification, are not prevalent in the language. Concerning the categories of constituents of Dangme compounds, N-N, N-P and N-A compounds have been identified and discussed in this chapter.

The chapter has also looked at the various relations that exist between the constituents of Dangme compounds as observed from the data. While some of these relations are direct, others are metonymic or metaphorical. Though the constituents of Dangme compounds may have different semantic properties, the relation between them determines their possible combination to form compounds. Hence the semantic properties and the relation that exist between the words in Dangme cannot be taken for granted as these could render the complex word unacceptable. Relations such *part of, ingredient of, causer of, location of* etc. have been found to exist between the constituents of Dangme compounds. I have argued that some constituents of the compounds lose their core semantic properties when they occur as members of compounds and this results in non-compositional meaning of some compounds in the language.

CHAPTER FOUR

DANGME NOUN-VERB AND VERB-NOUN COMPOUNDS

4.1 Introduction

This chapter looks at the other classes of Dangme compounds in terms of the categories that combine to form the compounds. These categories are the noun-verb and verb-noun compounds. Discussing these types of compounds, I focus primarily on their structure, semantics properties of the constituents and the constituents that function as heads of these compounds. The chapter also discusses the category of Dangme compounds and pointed out that irrespective of the categories of the constituents, the compound would be a noun.

In section 4.2, I discuss N-V compounds in the language, focusing on the semantic properties of the constituent as well as their structure and the relations that exist between the constituents and the compound as whole, and between the constituents themselves. Section 4.3 looks at V-N compounds, their structure and the semantic properties of the constituents. I argue that most of these compounds are exocentric because the meanings they evoke cannot be traced to their constituents. Section 4.4 and 4.5 discuss the syntactic category and headedness of Dangme compounds respectively. Regarding the category of Dangme compounds, I argue that compounding in the language is a nominalisation process and, therefore, we cannot make a case that the compounds inherit their syntactic category from the nominal constituents. Regarding classification based on headedness of Dangme compounds, I show that some Dangme compounds have meanings that are not inherited from the constituents of the compounds, even though others have head constituents,

which may be the left-hand or right-hand member of the compound. The section further discusses the types of exocentric compounds that are attested in Dangme. I show that Dangme has both possessive and non-possessive bahuvrihi compounds, as well as exocentric synthetic compounds. I go on to argue that non-compositional meanings of Dangme compounds stem from a semantic operator that appears to be a constructional property of the compounds. On headedness, I show that Dangme has both endocentric and exocentric compounds. Types of exocentric compounds that are attested in the language are also discussed. Section 4.6 concludes the chapter.

4.2 Dangme Noun-Verb Compounds

Noun-verb (N-V) compounds are very pervasive in Dangme. This is because almost every noun in the language can pattern with an action verb to derive N-V compound. As the label suggests, the nominal base precedes the verb base in the compound. In the formation of N-V compounds, action verbs usually combine with nouns to form a compound which usually denotes an activity, which may either be concrete or abstract.

One peculiar characteristic of Dangme N-V compounds is that most of them end with the bilabial nasal, /m / as a constructional property. Hevi (2011: 121) discussing Dangme morphology posits that, “it is required of the verbs in N-V compounds to be converted into action nominals through the suffixation of the nominal suffix *–m* for a new word to be formed.” Though this assertion may sound appealing, the data for this study shows otherwise. Table 9 below presents examples of N-V compounds in Dangme.

Table 9: Dangme N-V compounds

Base1	Gloss	Base 2	Gloss	Compound	Meaning
tsùí	heart	pō	cut	tsùípòm̀	frightening
hé	location	híí	to stay	héhìm̀	dwelling
nyã	mouth	kpɛ́	to sew	nyã̀kpɛ	wonder
ní	things	lé	to know	nílem	knowledge
nĩ́	things	sĩ̀ɛ̃́	to discuss	nisíɛ̃m̀	discussion
tsũ	house	mã́	to build	tsũmã̀m̀	building
túé	ear	gblàá	to pull	túégblàm̀	reprimand
hē	skin	yé	to eat	heyem	freedom
dã̀	wine	nṹṹ	to drink	dã̀nṹm̀	drinking
dò	drum	fìá	play	dòfìàm̀	drumming
yò	woman	ngɔ̀	receive	yòngɔ̀m̀	marriage
wɔ́	idol	já	worship	wɔ́jám̀	idol worship
nõ̀	person	gbè	kill	nõ̀gbèm̀	man slaughter
nyã̀	mouth	gbá	rive	nyã̀gbáḿ	disturbing
yīm̀	head	kpá	shave	yīm̀ kpá	bald headed
nyã̀	mouth	gbè	kill	nyã̀gbè	conclusion
sīsī	under	jè	origin	sīsījèm̀	beginning

As pointed out, the assertion of Hevi (2011) that the verb constituents nominalise prior to the compounding process has to be re-considered. Let's consider the examples in (1).

1. a. [[*tsō*]$_N$ 'tree'-*m*]$_N$ 'insidea tree',

   b. [[*júā*]$_N$ 'market'-*m*]$_N$ 'insidemarket'

   c. [[*mã̀*]$_N$ 'town'-*m*]$_N$ 'insidetown',

We can observe that the various bases of the words in (1) are nouns prior to the addition of the bilabial nasal. That is, *tsō, júā* and *mã̀* are underived nominals without the meaning *containment* (inside) being implied. However, the addition of the bilabial nasal contributes the meaning containment (inside) to the base. The bilabial nasal is a clitic of the word *mi* 'inside' and contributes the meaning *inside* to the base to which it is attached. The sentences in (2) explain this.

2. a. Àdwó ngɛ júā mi
Àdwó BE market inside
'Àdwó is in the market'
b. Àdwó ngɛ̄ júām̀
Àdwó BE market.inside
Àdwó is in the market'

This shows that the bilabial nasal in the examples in (1) semantically encodes 'containment' and not a categorial determinant of the base. In (2), we observe that both (a) and (b) have the same meaning. The constructions are nouns, whiles the bases are also nouns. From this observation, we can argue that the presumed suffix is a clitic of the form *mi* 'inside' because the nouns to which we see the bilabial nasal attached has the meaning 'inside'. Thus, the words in (1) could be written as *tsō mi* 'tree inside', *júā mì* 'market inside' and *mā̀ mi* 'town inside' and their meanings would not change as reflected in (2).

We observe that whenever *mi* 'inside' is attached to a base, they are written together with the form *mī* occurring as a clitic [-m] on the noun as shown in (1) above. The examples in (3) below are verb bases with the bilabial nasal.

3. a. [*fíé*]$_V$ 'to play' [*fíé –m̀*]$_N$ 'playing',
b. [*lá*]$_V$ 'to sing' [*lá-m̀*]$_N$ 'singing'
c. [*bɛ́ɛ́*]$_V$ 'to sweep' [*bɛ́ɛ́- m̀*]$_N$ 'sweeping'.

The difference between the examples with the verbal bases in (3a-c) and those with the nominal bases (1a-c) is that the addition of the bilabial nasal converts

the verbal bases to nominals in (3). Thus, the categorial class of the bases change together with their semantic contents.

The bilabial nasal that attaches to the nominal bases in (1) is not the same as the one that is attached to the verbal bases in (3). Unlike the words in (1), the meaning 'inside' is not included in the meanings of the words in (3). Thus, whereas, the bilabial nasal in (1) is a clitic of the word *mi* 'inside', the one in (3) is not. We have to consider the bilabial nasal in the examples in (3) as a constructional property of nouns that denote activity.

According to Hevi (2011: 124), "the verbal bases have to be nominalised through the suffixation of the bilabial nasal, /m/ before they combine with the left-hand constituent" to form N-V compounds. This view implies that compounds with these constituents are not N-V compounds but N-N. This is because the supposed verbal base of the compound loses it verbal category prior to the compounding process. The more revealing approach however, is to model the bilabial nasal on the verbal bases as holistic property of an abstract schema that generalises over nouns that denote activity instead of a suffix of the verbal constituent.

We may have to assume therefore that the right-hand constituents of N-V compounds are verbs and since the resultant compounds name an activity, the bilabial nasal attaches to the construction as a holistic property of the schema for Dangme N-V compounds that denote activity.

4.2.1 The Semantics of the Constituents of Dangme N-V Compounds

Nouns of diverse semantic types combine with action verbs to form N-V compounds in Dangme. The nominal constituents may be concrete (eg. *zũ,* 'soil' *tsō* 'tree', *bo* 'cloth', etc) or abstract (eg *júɛ̃m̀* 'mind', hǔ̀ 'hunger',

mũ̀ɔ̃̀ 'laughter', etc). The action described by the verbal base may be physical action (*dṹ* 'to plant', *pòó* 'to cut' *yé 'to eat',* etc.) or mental activity (eg. *kàsé* 'to learn' *súsú* 'to think', *nyɛ̃̀ɛ̃́* 'to hate' etc.).

The semantics of the constituents of the N-V compound is a determining factor in ensuring acceptability or otherwise of the compound. Thus, like N-N compounds, N-V compound constituents also have relations with each other. With the N-V compounds, the noun constituent is an internal argument of the verb and depending on the semantics of both constituents, the noun constituent could be the end result of the action designated by the verb (eg., *tsũmã̀m̀* 'building), 'location of the activity described by the verb (eg., héhìm̀ 'dwelling'), or the patient or sufferer of the activity described by the verb (eg., nyã̀ kpɛ 'wonder').

In a situation where the semantic properties of both constituents are not taken into consideration, the derived compound may not be acceptable in the language. Considering the examples **tò-dũm* 'goat planting' and **tsō -yēm̀* 'tree eating', the unacceptability stems from the fact that *tò* 'goat' in the compound *tòdũm* is such that it is not something that can undergo the action of the verb *dṹ* 'to plant', whiles *dṹ* 'to plant' on the other hand requires a nominal constituent whose referent can undergo the action it describes to combine with. In a similar manner, *tsō* 'tree' in *tsō yēm̀*[2] 'tree eating' is not edible, whiles the right-hand constituent, *yé* 'to eat' requires the denotation of its left-hand constituent to be edible. These construction may become acceptable in contexts when they are interpreted metaphorically.

[2] Tsōyēm̀ may be used to mean sexual activity youth. It is a not everyone who understands this word. For tòdũm̀, may become a possible word when it is understood as the act of burying dead goats/sheep.

The relation between the constituents of N-V compounds in the language is captured by the schema in (4) below with the compound *túégblàm̀* ‘reprimand’.

4. $< [[N]_i [\ V\ ]_j\ m]_{Nk} \leftrightarrow [SEM_j \text{ AFFECTING } SEM_i]]_k >$

$< [[túé]_{Ni} [\ gblà\ ]_{Vj}\ m]_{Nk} \leftrightarrow [\text{action of } gblàm̀_j \text{ AFFECTING } túé_i]]_k >$

[túé]$_{Ni}$ ‘ear’ [*gblà*]$_{Vj}$ *m*]$_{Nk}$ ‘reprimand’

4.2.2 Formal head of Dangme N-V compounds

Though the right hand verbal constituent of the compound does not share its formal property with the compound, it appears to some extent that it semantically heads the compound. However, to accept this view is to believe that the verbal constituent nominalises prior to becoming a part of the compound and that the semantic properties of the compound percolate from the nominalized right-hand constituent.

On the contrary, as Appah (2015) argues about N-V compounds in Akan, given the fact that in most cases there is no formal marking of the verb to show prior nominalisation, we cannot consider it to be the head. We cannot claim that N-V compounds in Dangme are endocentric. Appah (2015) posits, therefore, that following Bauer (2010a), we may have to consider these compounds as synthetic compounds, without committing to defending the prior nominalisation of the right-hand constituent.

A synthetic compound, as Appah (2013b) maintains, is not necessarily a compound with a deverbal head constituent. Rather it is one in which one of the constituents takes an argument which must be satisfied in the compound. Following from the argument for synthetic compounds and the potential

implication that the potential head of a nominal N-V compound has a wrong syntactic category, Appah (2013b) suggests that in situations like we find in Dangme N-V compounds, we have to assume that the syntactic category does not come from either of the compound members; but, it is a constructional property of the schema that these complex nominals instantiate. Thus, like all other compound types in Dangme, the category of the N-V compound is a constructional property rather than one that comes from the constituents through feature percolation. This will be discussed further on the section on exocentric synthetic compounds.

4.3 Dangme Verb-Noun Compounds

Verb-Noun (V-N) compounds are yet another type of compounds that speakers of Dangme form to refer to new concepts, objects and ideas. V-N compounds are compounds which consist of a verb and a noun. V-N compounds in the language are not many as reflected in the data set in Table 10.

Table 10: V-N Compounds in Dangme

Base 1	Gloss	Base 2	Gloss	compound	Translation
tó	to pack	hé	place	tóhé	location
kpè	to meet	hé	place	kpèhé	meeting place
dá	to stand	hé	place	dahé	standing place
mɑ̃́	to place	hé	place	mɑ̃hé	position
kè	to donate	ní	things	kèní	benefactor
bɔ	to create	ní	things	bɔ̀ní	creator
hùɔ́	to sleep	he	place	huɔ̀hé	sleeping place
tsá	to treat	hé	place	tsàhé	infirmary
súsú	to think	hé	side	súsúhé	one who thinks
kɑ̃́	to say	ní	things	kɑ̃́ní	one who swears

A crucial characteristic of Dangme V-N compounds is that, the verbal left-hand constituents are simplex in form. If the verb constituent of a V-N compound

bears a suffix (for instance the bilabial nasal /m/ or the agentive suffix *-lɔ)*, we would have to assume that the suffix is a nominalizer that nominalizes the verb prior to the compounding process, thereby making the compound N-N. The compound *dlàm̀hé* 'dressing place' which is made up of the deverbal noun *dlá -m*[3] *'dressing'* and *hé* 'place' is not V-N compound but rather N-N. Also, *gbàlɔ̀yò* 'married woman' is an N-N compound because the verb is nominalised through derivation prior to compounding. Thus, the main criterion for considering a constellation of two words, a verb and a noun, as a member of the class of Dangme V-N compounds is the absence of the final bilabial nasal /-m/ or the agentive marker /lɔ/ on a verbal constituent that occurs as a left-hand constituent.

4.3.1 The nominal constituents of Dangme V-N compounds

The nominal constituents of Dangme V-N compounds tends to be of a special kind as they seem to encode physical locations and concrete entities. They are internal arguments of the verbs in canonical clause constructions. The nominal constituents in Dangme V-N compounds are objects of the verbs. This makes V-N compounds in Dangme slightly different from their counterparts in Akan which may function as either subjects or objects of the verb constituents depending on the transītivity of the verb involved (cf. Appah 2016a). Most Dangme V-N compounds, encode location with the noun constituent naming the location of the action of the verbal constituent. However, examples like *kèní* 'benefactor' *kɑ́ní* 'swearer' and *bɔ̀ní* 'creator' are agentive rather than location.

[3] The bilabial nasal is part of the schema that action nominals intantiate. Hence, the word *dlám̀* is a noun that names an activity instead of a verb that has taken niminalisation suffix.

The only noun that combines with a verb to encode something different from location is *ní* 'things' as in the compounds *bɔ̀ní* 'creator' [lit. create + things] and *kèní* 'benefactor' [lit. donate + things] and *kɑ́ní* 'name of a person' [lit. say + things]. Similar to what has been observed in Akan (Appah 2016a:), the nouns that occur in Dangme V-N compounds mainly refer to the location of the activity designated by the verb or a place where, as a result of the activity designated by the verb, the referent comes to be located.

On the semantic properties of the verbs in Dangme V-N compounds, we see that, with the exception of the compound *bɔ̀ní* and *kèní*, all the verbal constituents describe physical actions with the right-hand nominal constituents denoting the locations of such actions. The noun constituents of the compounds *bɔ̀ní* 'creator, and *kèní* 'benefactor' name the entity that undergoes the action described by the verb constituents.

4.3.2 The head of Dangme V-N compounds

There are both endocentric and exocentric V-N compounds in Dangme. The right-hand constituent *hé* 'place' is the head of the compound words that contain it. It heads the compound because the meaning of the compound is a hyponym of the right-hand nominal constituent, *hé.* For example, *dàhé* [stand + place] 'position' is right-headed because it is a hyponym of the right-hand constituent *hé* 'place'. Position in this context could be a position where one stands (eg. in a queue) or status, rank or position based on the particular circumstance. A CxM schematic representation of the formal and semantic properties of the endocentric V-N compounds is shown in (5) with the compound *dàhé* instantiating it.

5 $<[[a]_{Xi}\ [b]_{Yj}]_{Nk} \leftrightarrow [SEM_j \text{ with a relation R to } SEM_i]_k>$

$<[[dá]_{Vi}\ [hé]_{Nj}]_{Nk} \leftrightarrow [place_j \text{ for } SEM_i]_k>$

dá 'stand' *hé* 'place' > 'position'

Unlike *hé* 'place', the right-hand nominal *ní* 'things' in the V-N compounds (*kèni, bɔ̀ní and kɑ́ní*) does not assume the position of a semantic head and therefore its referent cannot be said to be a set of items of which the compositional meaning of the whole compound is a sub-type; the compound, therefore, fails the hyponymy test. In attempting to analyse the V-N compounds with the noun *ní* 'things' as headless or exocentric, I am following Bauer (2010a) and Appah (2017b) who views exocentricity as the situation where a crucial feature required for full interpretation of a morphological construct is absent in the construction. Since the meaning AGENT in the compound cannot be identified with either of the constituents, the compound is exocentric.

The V-N compounds, *kèní* and *bɔ̀ní* as can be observed, are participant exocentric synthetic compounds (cf. Appah 2017a). They refer to one of the participants involved in the action described by the compositionalmeaning of the compound. Generally, the meanings of the compounds with *ní* as right-hand constituent are the arguments that cause or instigate the actions of the left-hand verbal constituent. Appah (2016b: 110) refers to these type of exocentric compounds as agentive exocentric synthetic compounds. These are exocentric because the salient property of the constituents that assigns the meaning *agent* to the compound as a morphological construct is not expressed

in either of the compound constituents. This type of Dangme V-N compounds is shown in (6).

6 $< [[V]_i\ [N]_j]_{Nk} \leftrightarrow [SEM]_k >$

$< [[ké]_{Vi}\ [ní]_{Nj}]_{Nk} \leftrightarrow [\text{Agent of } SEM_i \text{ affecting } SEM_j]_k >$

kè 'donate' *ní* 'things' > 'one who donates/ benefactor'

The covert form in the compound that encode the agentive meaning is intuitive in the sense that anytime an activity is performed, we assume that an entity performed the activity and therefore its absence in the construction does not interrupts the semantic coding of the construction.

In this sub-section, we have seen that the noun constituent of Dangme V-N compounds is either *ní or hé*. In trying to delineate the membership of the class of V-N compounds in the language, I explained that the left-hand constituents of V-N compounds are bare without the bilabial nasal or the agentive suffix *-lɔ*. I have again shown that a Dangme V-N compound may be endocentric and exocentric. While those that take nominal *ní* 'things' are exocentric, those with *hé* are endocentric.

4.4 Syntactic Category of Dangme Compounds

The syntactic category of Dangme compound words, as has been shown from the discussion so far, is a noun. Thus, irrespective of the categories of the constituents that combine to form the compound in the language, the resultant complex word is always a noun. All Dangme compounds are nominals and do not show any deviation, in this regard, from Akan (cf. Appah 2013b) and Lɛtɛ

(cf. Akrofi-Ansah 2012). It has been shown in the discussion that in situations where one or both of the constituents of the compound are nominals, the category of the compound itself is not inherited from the constituents but rather supplied by the meta-schema in the lexicon of the language that generalizes over all compounds in the language. Thus, the meta-schema ensures that every compound word in the language is marked for the categorial feature, noun. Compounding in the language, like most of the languages it shares boarders with including Akan and Lɛtɛ, is a nominalization process and forms the principal process of forming nouns to refer to concepts and entities in the language.

4.5 Classes of Dangme Compounds by headedness

One of the main criteria for classifying compounds is the presence of a constituent that shares formal and/or semantic properties with the whole compound. Two major types of compounds based on this criterion have been identified: endocentric and exocentric. A compound that has one of its constituents as a head is an endocentric compound while the one without any head constituent is exocentric. Endocentric compounds, according to Bauer (2009b), are "compounds which are hyponyms of their head element". For example, *school bus* is a type of *bus,* the right-hand constituent. The whole compound, *school bus,* is therefore a hyponym of its head, *bus*.

Exocentric compounds do not inherit all of their semantic properties from their constituents. For instance, the Akan compound *àsò-kètɛ́* 'a person with ears like mat' [lit. ear mat] is neither a type of *àsò* 'ear' nor *kètɛ́* 'mat' (Appah

2015b). The Exocentricity of this compound, therefore, stems from the fact that the meaning *one who* is not inherited from either of the compound members.

4.5.1 Endocentric compounds in Dangme

Majority of the compound words in the data are headed by one of the compound members; they are endocentric. Dangme endocentric compounds may be left headed or right headed. A right-headed compound is the one in which the meaning of the compound is a sub-set of all the entities named by the right-hand constituent. The whole compound is therefore in a hyponymy relation with the right-hand constituent. Consider the examples in Table 11.

Table 11: Endocentric compounds in Dangme

Base 1	**Gloss**	**Base 2**	**Gloss**	**Compound**	**Type**	**Translation**
zíá	sand	zũ	soil	zíázũ	N-N	sandy soil
blɛ̀fó	maize	gbà	hut	blɛ̀fógbà	N-N	maize hut
ngã	thatch	tsʊ̀̃	house	ngã̀tsũ	N-N	thatch house
mã̀wʊ̃́	god	mʊ̃́nyʊ̃́	word	mã̀wʊ̃́ mʊ̃́nyʊ̃́	N-N	god's word
pà	river	tsō	tree	pàtsō	N-N	wood bridge
àgbèlí	cassava	bà	leaf	àgbèlíbà	N-N	cassava leaf
sɔ̀lém̀	church	lɔ̀lé	bus	sɔ̀lèm̀ lɔ̀lé	N-N	church bus
bí	child	nyʊ̀̃mũ	male	bí nyʊ̀̃mũ	N-N	male child
mã	to place	hé	place	mãhé	V-N	position
dā	to stand	hé	place	dāhé	V-N	rank/status
mã̀	town	mómó	old	mã̀ mómó	N-A	old town
dè	hunting	lò	meet	dèlò	N-N	game meat
wē	house	tsɛ̄	owner	wētsɛ̄	N-N	landlord
tsɛ̄	father	wàyó	small	tsɛ̄ wàyó	N-A	young uncle

It can be observed from Table 11 that some of the constituents in Base 2 are the heads of their respective compounds and they occur as right-hand members of the compounds. For instance, *zíázũ* 'sandy soil' is a type of *zũ* 'soil', *mãhé* 'position' is a type of *hé* 'place' and *àgbèlíbà* 'cassava leaf' is a type of *bà*

'leaf' Dangme endocentric compounds are formed from different combinations of syntactic categories, such as N-N, N-A and V-N, with N-N being the majority.

Dangme right-handed endocentric compounds instantiate an abstract schema that generalizes over all right-hands headed N-N compounds. In other words, the schema is instantiated by specific complex words that are types or hyponyms of their right-hand constituents. This instantiation is exemplified in (7) below with the compound *àgbèlìbà* 'cassava leaf'

7 $[\text{àgbèlì}]_{Ni}\ [\text{bà}]_{Nj}]_{Nk} \leftrightarrow [\text{SEM}_k$ *is a type of* $\text{SEM}_j]_k >$

agbeli 'cassava' ba 'leaf' > 'cassava leaf' [cassava leaf is a type of leaf]

The schema in (7) indicates that the complex word *àgbèlìbà* is a type of *bà*, the head of the complex word. It also shows that the two constituents are in *part of* relation with the compound. This means that *bà* 'leaf' and *àgbèlì* 'cassava' are constituents of the compound.

The compound, *àgbèlíbà,* on the other hand directly relates with *bà* by being a subset of all the entities named by *bà;* hence, the compound *àgbèlìbà* exemplifies a hyponymy relation with *bà*. This implies that if one were to pick every entity that is considered as *bà* 'leaf', *àgbèlíbà* 'cassava leaf' will definitely be included in the list.

4.5.2 Dangme Exocentric Compound

In this section, I discuss the classes of Dangme exocentric compounds, following the characterisation of the types of exocentric compounds in Appah (2017b). Exocentric compounds are those compounds whose meaning and or formal properties are not predictable just by resorting to information encoded in the constituents of the compound. The notion exocentric, therefore, implies, to some extent, that the meaning of the compound is 'out-centered'. This means that the centre' (head), is not in the compound (Appah 2013b; Bauer 2010a; Booij 2010; Scalise & Fábregas 2010; Scalise & Guevara 2006; Scalise & Vogel 2010b).

Exocentric compounds do not have heads, even though the meaning of the compound may be related to the constituents. Characterising a compound in Dangme as exocentric is, therefore, not the same as saying that the meaning of the compound has nothing to do with the meanings of any of the compound members. This is because, in most cases, the meaning of the compound is related to at least one of its constituents. For instance the Akan compound *àbrékyìréà bɔ̀gyésɛ́* [*àbrékyìré* 'goat'+ *àbrékyìré* 'beard'] is neither *àbrékyìré* 'goat' nor *àbɔ̀gyésɛ́* 'beard', but a grass which is difficult to weed or control (cf. Appah 2016b). The meaning of the compound is therefore related to the constituents metonymically or through semantic extension.

Booij (2012: 345) observes that the "systematic properties of compounds need not be derived from the head, but can be seen as holistic properties of the compound construction as such". In consonance with the observation of Booij (2012), exocentric compounds in Dangme name or refer to entities or concepts that are not contained in the referent of the constituents of the compounds

though they may be related to one of the constituents. Bahuvrihi and exocentric synthetic compound types are identified in Dangme based on the available data.

4.5.2.1 Bahuvrihi compounds in Dangme

A bahuvrihi compound is an exocentric compound whose referent is not named in the compound's constituents (Bauer 2010b). A compound of this nature is considered exocentric because its meaning cannot be worked out from any of its constituents. Bahuvrihi compounds are therefore said to have failed the hyponymy test because none of the constituents is considered a superordinate term of the compound. The bahuvrihi compounds in the database are grouped into possessive and non-possessive types following the typology of Akan exocentric compounds (cf. Appah 2017b).

4.5.2.1.1 Possessive bahuvrihi compounds in Dangme

Possessive bahuvrihi compounds refer to exocentric compounds for which the meaning of the compound is the possessor of the compositional meaning of the compound. Considering the Dangme compounds *nànégédé*, 'someone who has lean legs' [lit. leg + lean], *mìmì àgbò* 'someone who has pot belly' [stomach + big] and *nyɜ̀ka* 'crocodile/one with a long mouth', we observe that these compounds refer to the entities that possess the 'lean leg' and 'pot belly' and 'long mouth' respectively; though none of the constituents of the compounds names this possessor entities for it to be considered the semantic head. Dangme possessive exocentric compounds are listed in Table 12.

Table 12: Dangme possessive exocentric compounds

Base1	Gloss	Base2	Gloss	Compound	Type	Translation
twí	heart	tsɛ̄	father	twítsɛ̄	N-N	Temperance
nànɛ́	leg	gédé	lean	nànɛ́ gédé	N-A	one who has lean leg
nyɛ̀̃	mouth	kā	long	nyɛ̀̃kā	N-A	crocodile/one with a long mouth
mì	stomach	àgbò	big	mì àgbò	N-A	one who has pot belly
yī	head	tsɛ̄	father	yītsɛ̄	N-N	one who has big head
híɔ̀	sīckness	tsɛ̄	father	híɔ̀tsɛ̄	N-N	mad person
mì	stomach	tɔ̄	bottle	mìtɔ̄	N-N	one who has pot belly
nɛ̀̃né	leg	gágá	long	nɛ̀̃né gágá	N-A	one with long legs
yìm̀	head	kpá	to wear	yìm̀kpá	N-V	One with bald head

The nominal constituent of N-A bahuvrihi compounds in Dangme are usually body-part nouns such as *yī* 'head', *nyɛ̀̃* 'mouth', *twí* 'heart', *mìmì* 'stomach' and *nànɛ́* 'leg'. The adjective constituents tend to be adjectives of dimension (eg. *àgbò* 'big', and *kā* 'long'). With the compound *yīm̀kpa* 'bald headed', the right-hand constituent is an action verb.

The relation between the constituents within the noun-adjective, $[N\text{-}A]_N$ bahuvrihi compound may be spelt out as "having/is", and this translates into $[N_j \; \Re \; A_i]_{Nk}$ with N_i having the property A_j or A_j predicated of N_i (cf. Appah 2013b; Bauer 2010b). This exemplified in (8) below.

8. $< [[N]_i \; [A]_j]_{Nk} \leftrightarrow [SEM_i \text{ having/is } PROPERTY_j]_k >$

$< [[$*nànɛ́*$]_i \; [$*gédé*$]_j]_{Nk} \leftrightarrow [$*nànɛ́*$_i$ which is *gédé* $_j]_k >$

nɛ̀̃né 'leg' *gédé* 'slim' 'one with lean legs'

In Dangme N-N bahuvrihi compounds, the left-hand member modifies the right-hand member by naming or describing a property of it. Considering the compound *mìtɔ̄* 'someone who has pot belly' [lit. stomach bottle], it is observable that *mì* 'stomach', the right-hand constituent is ascribed with the

property (in this case shape) of *tɔ* ‘bottle’. *Mìtɔ̄* can be then be likened to the Akan compound *àsò kɛ̀tɛ́*, [lit. ear mat] (cf. Appah 2017b), in which the left-hand constituent *àsó* ‘ear’ is likened to *kɛ̀tɛ́* ‘mat’. Thus the relation between the constituents of compounds of this nature may be spelt out as “is like”. That is, [POSSESSOR OF $[N_i \ \Re \ N_j]_{Nk}$ translates into “N_i is like N_j”. Thus, *mìtɔ* is *mi* ‘stomach’ which is like *tɔ̄* ‘bottle’ as shown in (9). Thus *mì* ‘stomach’ is said to have the shape of *tɔ̄* ‘bottle’. This is explicated in the schema (9) below.

9. $< [[N]_i \ [N]_j]_{Nk} \leftrightarrow$ [POSSESSOR OF SEM_i which is like $SEM_j]_k >$

$< [[mì]_i \ [tɔ̄]_j]_{Nk} \leftrightarrow$ [POSSESSOR of $mì_i$ which is like $tɔ̄_j \ ]_k >$

m*ì* ‘stomach’ *tɔ̄* ‘bottle’

The interpretation of the possessive bahuvrihi compound requires that the hearer of the word has knowledge of the associated meaning (conventionalisation) sincethe meaning may not depend entirely on the constituents of the compound. Appah (2015a) observes that to enable appropriate interpretation of compounds of this nature one needs to identify the extra semantic features that are external to the constituents of the compound. The supposed semantic head of the compound which is not found in either of the constituents is regarded by Bauer (2008: 58-59) as an “unexpressed element in the head position which carries some features of the denotatum”. The unexpressed semantic feature in the examples in Table 9 may be considered as “possessor”. This unexpressed semantic feature, according to Bauer (2008: 59), could be assumed to be “a zero morph that bears the feature [+human].”

Appah (2015) alternatively analyses the supposed unexpressed semantic feature as an operator over the compositionalmeaning of the compounds instead of a zero morph, following the argument that the "systematic properties of compounds need not be derived from the head, but can be seen as holistic properties of the compound construction" (Booij 2012: 345). Possessive bahuvrihi compounds in Dangme instantiate the general schema in (10) with subschemas in (11).

10. $< [[X]_i\ [Y]_j]_{Nk} \leftrightarrow [SEM\ [SEM]_i\ \Re\ to\ [SEM]_j]_k$ (Appah 2015:376)

11. a. $< [[N]_i\ [N]_j]_{Nk} \leftrightarrow [POSS\ [SEM]_i$ which is like $[SEM]_j]_k >$

b. $< [[N]_i\ [A]_j]_{Nk} \leftrightarrow [POSS\ [SEM]_i$ which is $[SEM]_j]_k >$

c. $< [[N]_i\ [V]_j]_{Nk} \leftrightarrow [POSS\ [SEM]_i$ which is affected by $[SEM]_j]_k >$

The subschemas in (11) show that Dangme possessive bahuvrihi compounds may be formed from N-N, N-A and N-V constituents. In these compounds, there is no form that we can associate the meaning POSSESSOR with. This is illustrated with the compound *nyɛ̀kā* 'someone with long mouth' [lit. mouth long] in (12).

12. $< [[nyɛ̀]_{Ni}\ [kā]_{Aj}]_{Nk} \leftrightarrow [POSS\ [nyɛ̀]_i$ which is $[kā]_j]_k >$

nyɛ̀ 'mouth' *kā* 'long' ↔ 'someone with a long mouth'

The exocentricity of the compounds stems from the fact that they do not have the constituent that denotes person or the possessor and, therefore, the meaning POSSESSOR is a constructional property of the compound.

4.5.2.1.2 Non-possessive bahuvrihi compounds in Dangme

A non-possessive bahuvrihi compound is the type of exocentric compound that does not refer to the possessor of the compositional meaning of the compound (Booij 2010). The meaning of the compound is not easily predictable by just considering the meaning(s) of the compound members. This is because the constituent members of the compound are usually not directly related semantically to the compound's referent. Thus, a non-possessive bahuvrihi compound lacks some crucial semantic property that is needed for full interpretation of the compound. In other words, a crucial semantic property required for the full interpretation of the non-possessive bahuvrihi compounds in Dangme is external to the compounds. Table 13 below contains examples of non-possessive bahuvrihi compounds in Dangme.

Table 13: Dangme non-possessive bahuvrihi compounds

Base 1	**Gloss**	**Base 2**	**Gloss**	**Compound**	**Type**	**translation**
là	fire	zũ	soil	làzũ	N-N	ash
tò	goat	kóli	horn	tòkóli	N-N	couch grass
yā	funeral	sī	under	yāsī	N-N	funeral ground
yò	woman	sàá	wether	yòsàá	N-N	barren woman
júkwé	child	àsī	under	júkwé àsī	N-N	childhood
wàm̀ĩ	growth	sī	under	wàm̀sī	N-N	adulthood
fɔ́m̀	birth	sè	back	fɔ́m̀sè	N-N	placenta
àkótó	NAME	hɛ́gmɛ́	eye	àkótó hɛ́gmɛ́	N-N	jagger bush

In the compound *tòkòlí* 'couch grass' [lit. goat horn], for instance, it can be realised that the compound's referent is the metaphorical extension of the

features of the compositional meaning of the compound, so that the compound has to be interpreted metaphorically. For the compound *tòkòlí* ‘couch grass’, the referent’s stubbornness to be handled is likened to that of the nature of a goat that can hurt you with its horn when you attempt to catch it. This falls in the class of compounds that Appah (2017b) calls property bahuvrihi compounds.

Compounds of this kind are not headed because there is no apparent head-dependent relation between the compound and its constituents. The unavailable semantic feature needed for the interpretation of the compounds makes them exocentric. The meaning of the compound is, therefore, not directly related to its constituents. This is illustrated in (13) below.

13. < [[*tò*]$_{Ni}$ [*kòlí*]$_{Nj}$]$_{Nk}$ ↔ [ENTITY$_Z$ which is like *tò*$_i$ which has *kòlí*$_j$]$_k$ >

tò ‘goat’ *kòlí* ‘horn’ → ‘name of a weed’

In Dangme, bahuvrihi compounds comprise inanimate (14a) and animate entities (14b). However, the nature of these entities earns them their status through metaphorical extension of entities that possess such attributes.

14. a. Àpàátsɛ̄ ɛ̄ gbà àkótó hɛ́gmɛ́ ɛ̄.
labourer DEF weed.PST NAME eye DEF
‘The labourer weeded the jagger bush’

In (14a), the weed gets its name because its thorns pieced Àkótó’s eye making him to lose his sight. Thus, *àkótó hɛ́gmɛ́* is not the eye of Àkótó but that which caused Àkótó to lose his sight.

Exocentric compounds whose meaning denote locations are also present in Dangme. According Appah (2017) "a location bahuvrihi compound is the type which usually refers to a location in time or space, where there is no element that names the specific location." In Dangme, as observed in Table 14, the meanings of some non-possessive compounds are locations. However, as observed by Appah (2017) about locative bahuvrihi compounds in Akan, these locations are not always physical but may refer to time, specifically, stage of development. We may observe that while *Júkwé -àsĩ* 'infancy' and *wàm̀sĩ* 'adulthood', name locations in time (stage of development), *yāsì* 'funeral grounds' and *pànyɛ̀̃* 'riverside' name physical locations (space). Table 14 presents some examples of Dangme locative exocentric compounds.

Table 14: Dangme locative exocentric compounds

Base1	Gloss	Base2	Gloss	Compound	Category	Translation
yā	funeral	sī	under	yāsī	N-N	Funeral ground
júkwé	child	àsī	under	júkwéàsī	N-N	infancy
pà	river	nyɛ̃̀	mouth	pànyɛ̃̀	N-N	riverside
wām̀	growth	sī	under	wàm̀sī	N-N	adulthood
dò	dance	sĩsĩ	under	dòsĩsĩ	N-N	dance hall

Dangme location exocentric compounds, as Table 14 shows, have N-N structure in which the left-hand constituents mostly name concrete objects such as *pà* 'river', *júkwé* 'child' and pà 'river'. The left-hand constituents may not always refer to concrete entities as in the case of *yā* 'funeral', *dò* 'a dance' and *wām̀* 'growth'. The non-concrete left-hand constituent of the compounds *yāsĩ* and *dòsĩ* may be considered to some extent as activities that may be performed by animate entities. The sentences in (15) explain this.

15. a. Àdwó fó yà.
Àdwo cry cry
'Adwo cried'

b. Àdwó fiá dò ngɛ́ yàsī.
Àdwó play drum/ spinner BE funeral ground
'Àdwó plays/ spins at funeral grounds'

c. yàsĩ píɔ̀ hòò.
funeral ground make noisy
'funeral grounds becomes noisy'

d. Kɔ̃̀ bà-á ngɛ̃ dò-sĩsĩ.
Fight come-HAB BE dance-under
'fight erupts at dance halls'

The right-hand constituents, on the other hand, are usually relator nouns (cf. Osam, Duah, & Blay 2011) such as *sīsī* 'under/bottom' *sè* 'back', *nõ* 'top', etc

As observed about locative exocentric compounds in Akan (cf. Appah 2017b), in the occasion that the compound names a stage in development such as *júkwéàsī* 'infancy' [lit. child + under], it can be realized that, though the left-hand constituent names the entity whose stage of development is described by the compound, the interpretation of the compound is purely the stage and all other things that are associated with that stage. Locative exocentric compounds instantiate the general schema in (16). In the general schema we observe that the right-hand member of the compound is the location (in space or time) of the left-hand member.

16. $< [[N]_{Ni} \ [N]]_{Nj} \ ]_k \leftrightarrow [\text{Location of SEM}_i]_k >$ (cf. Appah 2015: 387)

In the compounds *júkwéàsī* ‘infancy’, for instance, the left-hand constituent seems to modify the right-hand constituent and therefore shows the relation instantiated in (17) below.

17. $< [[N]_{Ni}[N]_{Nj}]_{Nk} \leftrightarrow [SEM_j \text{ of } SEM_i]_k >$

$< [[júkwé]_{Ni}\ [àsĩ]_{Nj}]_{Nk} \leftrightarrow [\text{time of } SEM_i]_k >$

júkwé ‘child’ *àsí* ‘under’ > ‘infancy’

The example in (17), *júkwéàsī* ‘infancy’, illustrates locative exocentric synthetic compound that indicates location in time or period.

In the situation where the compound names a physical space of an event designated by the left-hand constituent, as exemplified by the compound *yāsĩ*, ‘funeral grounds’ [lit. funeral + under] we observe that the referent of the compound is the location of the event described by the left-hand constituent with everything the activity entails. For instance, in example (15c), we realise that it is not the location *yāsī* per se that is noisy, but the activities taking place at the location, *yāsĩ*, ‘funeral grounds’ make the place noisy.

Though the relation between the constituents is clear, none of the constituents seems to stand out as head semantically as far as the interpretation of the compound is concerned. A locative exocentric compound that indicates physical location is illustrated in (18) below.

18. $<[[N]_i[N]_j]_{Nk} \rightarrow [SEM_j \text{ of } SEM_i]_k>$

$< [[yā]_{Ni}\ [sī]_{Nj}]_{Nk} \rightarrow [\text{grounds for } SEM_i]_k >$

Yā ‘funeral’ sī ‘under’ → ‘funeral grounds’

4.5.2.1.3 Dangme agentive exocentric synthetic compounds

The other class of Exocentric compounds found in the data is what Appah (2017a) refers to as the participant exocentric synthetic compounds. Participant exocentric synthetic compounds may "refer to any one of the participants involved in the action designated by the compositional meaning of the compound" (Appah 2016b: 110). A compound is considered exocentric synthetic when the compound does not contain any morpheme like English *-er*/*-or*, that corresponds to the external argument of the verb (Appah 2016a). However, the verb and its internal argument form a noun that refers to the entity that performs the role of the external argument. Considering the French compound *gratte-ciel* 'skyscraper' [lit. scratch-sky], the internal argument of the verb together with the verb are found but the compound as a whole refers to the external argument – *that which scratches the sky*.

Appah (2016b) proposes the schema in (19) as the general schema for agentive exocentric synthetic compounds where the missing meaning AGENT, is an operator over the literal meaning of the compound.

19. $< [[V]_i\ [N]_j]_{Nk}$ [Agent of SEM_i affecting $SEM_j]_k$ (Appah 2016b: 110)

Table 15 below provides examples of agentive exocentric synthetic compounds in Dangme.

Table 15: Dangme Agentive exocentric synthetic compounds

Base 1	Gloss	Base 2	Gloss	Compound	Type	Translation
kè	to donate	nĩ	things	kènĩ	V-N	benefactor
bɔ̀	to create	nḯ	thing	bɔ̀nḯ	V-N	creator
gbé	to kill	nɔ̀̃	person	gbénɔ̃́	V-N	death
kǎ́	to swear	nḯ	things	kǎ́nḯ	V-N	swearer

The compounds *kèní* ‘benefactor’ [lit. to donate/give + things] and *bɔ̀ní* ‘creator’ [lit. to create + things] are agentive exocentric synthetic compounds because they refer to the agent of the action/event described by the compositional meaning of the compound. These compounds are exocentric because the meaning *‘one who Vs’* or ‘performs the action denoted by the compound is not inherited from any of the compound members but rather a constructional property of the complex word.

The structure and meaning of the agentive exocentric synthetic V-N compound *kèní* is shown in (20). We observe that there is no agentive marker *lɔ/li*, as present in the endocentric synthetic compounds *nɔ̀̃-gbé-lɔ̃* ‘murderer’ or *tsɯ̀̃-mɑ̀̃-li* ‘house builders’. However, the meaning of the compound is the agent of the literal meaning of the compound, hence rendering the compound exocentric.

Dangme V-N compounds in general show that there are meaning components of the compounds that are not expressed in the constituents of the compounds as observable in the compounds *kéní* ‘benefactor’, *bɔ̀ní* ‘creator’ and *gbénõ* ‘death’. The missing meaning (AGENT), is therefore an operator over the literal meaning of the compound as shown in (20).

20. $[ké]_{Vi}\,[ní]_{Nj}]_{Nk} \leftrightarrow [\text{AGENT of Action}_{i\ SEMi}\ \text{affecting}\ SEM_j]_k$

ké ‘give’ ní ‘things’ > ‘giver of things/ benefactor’

4.6 Chapter Conclusion

This chapter has discussed N-V and V-N compounds in Dangme. Concerning N-V compounds, it has been shown that action verbs combine with nouns to form compounds that describe activities, which may be physical or abstract. It has been argued that the bilabial nasal that is found at the end of most N-V compounds is a constructional property that is part of the schema that is instantiated by these compounds. Concerning the acceptability of the resulted compound, the semantic properties of the constituents play a principal role. Thus, the noun constituents of the N-V compounds must possess the features that make it possible to undergo the action described by the verb. On the semantics of N-V compounds, I argue that most of them are not transparent as they have to be understood metaphorically or metonymically.

Regarding V-N compounds, we observed from the discussionthat both constituents are simplex, with the nominal right-hand constituent being either *ní* 'things' or *hé* 'place'. I argued that the verbal left-hand constituent, because it is a verb prior to the compounding process, does not take the clitic form [*-m*] of *mi* 'inside' nor the agentive nominaliser *lɔ/li* 'one who'. It was evident in the discussion that V-N compounds that take the nominal constituent *hé* 'place' usually encode location where the event described by the verb occurs. With V-N compounds that take *ní* 'things' as nominal constituent, it was noted that they name the entity that performs the action of the verbal constituents and therefore, such compounds usually encode agentive arguments of constructions that these verbs form. On the Exocentricity of V-N compounds, I argued that sincethe meaning AGENT which these compounds encode is not associated

with the semantic properties of either of the constituents, we have to consider these compounds as exocentric.

On the issue of the syntactic category of compounds in Dangme, I have argued that though some of the constituents of these compounds are nouns, the compounds don't inherit their syntactic category from the nominal constituents. This observation is based on the fact that, as shown in the discussions on the classes of Dangme compounds based on syntactic categories of the constituents, all the compounds have one syntactic category (noun). Thus, while semantic properties of the constituents of Dangme compounds may percolate to the whole compound, the syntactic categories of the constituents do not percolate and, therefore, as suggested by Appah (2013b) about Akan compounds, we should consider the nominal syntactic category of compounds in Dangme as a holistic property compound constructions in general.

Regarding exocentric compounds in the language, both possessive and non-possessive bahuvrihi compounds were identified and discussed. I showed that possessive bahuvrihi compounds usually have their right-hand constituents ascribing some properties to the left-hand constituent. The constituents therefore have the relation SEM_i is like SEM_j. Concerning the possessive meaning of bahuvrihi compounds, it was argued that, it was supplied by the schema that these compounds instantiate and therefore does not originate from the compound members. With non-possessive bahuvrihi compounds, I identified and described locative and property bahuvrihi compounds. Agentive

CHAPTER FIVE

DANGME NUMERAL COMPOUNDS AND PHONOLOGICAL PROCESSES OF DANGME COMPOUNDS

5.1 Introduction

I have shown so far that compounding is one of the ways through which Dangme increases its stock of vocabulary, particularly referring expressions. In the language, the collocation of two numerals also forms another numeral with specific referent. This chapter focuses on compounds that involve two numerals such as *nyìgmitɛ̃* 'thirty' [lit. decade three] and *làfɛ́ɛ́nyɔ̀̃* 'two hundred' [lit. hundred two]. The goal of this chapter, therefore, is to identify and describe numeral compounds, by looking at how they are formed and why they should be considered as compounds. It also identifies and explains some phonological processes that are triggered when two numerals combine to form a numeral compound. The section on the phonological processes, however, looks at phonological processes that are identifiable in Dangme compounds.

The rest of the chapter is organised as follows: Dangme numeral compounds are discussed in section 5.2, where the issues of compounding of numerals are discussed within the framework of CxM. In this section, I examine Dangme compound numerals and their formation. I delineate numerals that are examples of compounds and those that are phrases. I also analyse the issues of the grammatical category and headedness of Dangme numeral compounds.

Section 5.3 looks at some phonological processes that are triggered by the formation of compounds in the language. It specifically looks at the instances of vowel elision (hiatus resolution), vowel lengthening and vowel coalescence. In section 5.4, I present the conclusion of the chapter.

5.2 Dangme Numeral Compounds

Numerals reveal certain attributes of grammar of languages that make the study of numerals worth considering. For instance, the study of numerals, as shall be seen in this section, provides evidence for the relationship between morphology and syntax, and that of phonology and, therefore, the architecture of the grammar of language. In spite of the importance and frequent use of numerals, little attention is given to them in linguistic studies. For Von Mengden (2010: 1), this "discrepancy can perhaps be accounted for by the fact that the semantics of cardinal numerals seem quite plain and their use rather natural." However, counting and quantifying of things, a function of numerals by speakers of languages is so frequent and this necessitates the need to study the mechanisms that underlie their formation.

Numerals in general are grouped into cardinal numerals and ordinal numerals. According to Crystal (2003), Cardinal is a traditional term retained in some models of grammatical descriptions, referring to the numerals one, two, three etc., in contrast with the ordinal first, second, third, etc.

Discussing the numerals 20 to 90, and 200 to 900 in the Asante and Akyem Twi dialects of Akan, Ofori (2008) observes that these numerals are compounds and in attempting to account for their formation he identifies morphophonological processes such as vowel harmony, deletion and

compensatory lengthening which occur at the inner periphery of the constituents to ensure the well-formedness of the numerals. The position of Ofori (2008) on Akan numerals indicating that they are compounds and that their formation tends to trigger phonological processes is crucial to this work as his observations are consistent with numerals in Dangme. This is because, as I argue in this work, some Dangme numerals are formed by employing compounding process, and also, their formation triggers some phonological processes.

In this section, I analyse Dangme numerals as constructions and formalise them as constructional schemas occurring in a hierarchically structured lexicon, with two types of relation, instantiation and part of (cf. Appah, 2016b; Booij, 2010b, 2016). Thus, the constructional model affords a framework for a unified account of the morphological and the syntactic means of forming numerals. This way, according to Appah (in press), we make explicit the fact that lexical units may be constructed according to morphological schemas with specific formal and semantic properties, and also account for the functional equivalence between morphology and syntax without masking their formal difference(s) (cf. Booij, 2009, 2010b).

5.2.1 Structure of numeral compounds in Dangme

A numeral may be unmotivated mono-morphemic unit, a full syntactic construction, including coordinate constructions, or a morphological construction, a concatenation of two numerals. In decimal numeral systems, for example, numerals ‘1’ - ‘12’, and ‘100’ and ‘1000’ in English are unmotivated, mono-morphemic pieces. In addition to these numerals that are unmotivated,

there are other numerals whose formation are syntactic in nature, with others too formed morphologically. Considering the numerals *sixty*, *seventy*, *eighty* and *ninety* in English, it can be observed that they are derived complex constructions (through suffixation). They are formed by suffixing –i*ty* to the bases *six*, *seven eight*, and *nine*, respectively. On the other hand the formation of the numerals such as *twenty-two* (22) and *thirty-five* (35) involves the process of compounding. Dangme cardinal numerals exist in two different forms, structurally: simplex (monomorphemic) and complex.

5.2.1.1 Simplex Numerals in Dangme

In Dangme, numerals '1' - '10', '100' and '1000' are unmotivated mono-morphemic words. Their structure is simple. Table 16 below exemplifies simplex numerals in Dangme.

Table 16. Dangme simplex Numerals

Numeral	Translation
káké	one
ényɔ̀̃	two
étɛ̃	three
éwĩɛ	four
énúɔ̃	five
ékpà	six
kpààgó	seven
kpàànyɔ̀̃	eight
nɛ̃ɛ̃	nine
nyɔ̀̃gmã	ten
làfá	hundred
àkpé	thousand

Dangme simplex numerals consist of those that have initial vowels and those that begin with consonants. The simplex numerals, with the exception of *àkpé* 'thousand' which begins with the low vowel *à,* either begin with a high tone

vowel / é / or a consonant. Like most Dangme words, the basic numerals also end with vowels.

5.2.1.2 Complex numerals in Dangme

Complex numerals in Dangme are of two kinds: additive and multiplicative (Schapper & Klamer 2014). Additive complex numerals are formed by addition of two numerals, whereas multiplicative complex numerals consist of compounding of two numerals.

5.2.1.2.1 Additive complex numerals in Dangme

Additive numeral is a numeral in which the relation between components parts of the complex numeral is one of addition. The component parts of the additive numerals are "augend", the part of the numeral that exist before another numeral is added, and "addend", the numeral that is added. So, for example, in the equation 10 + 5 = 15, the augend is 10 and the addend is 5 (Schapper & 2014: 289). Table 17 below shows additive complex numerals in Dangme.

Table 17. Dangme Additive Complex numerals

Numeral	Translation
nyɔ̀gmã kɛ kake	eleven
nyɔ̀gmã kɛ enyɔ	twelve
nyɔ̀gmã kɛ étɛ̃	thirteen
nyɔ̀gmã kɛ ewiɛ	fourteen
nyɔ̀gmã kɛ énúɔ̃	fifteen
nyɔ̀gmã kɛ ékpà	sixteen
nyɔ̀gmã kɛ kpààgó	seventeen
nyɔ̀gmã kɛ kpàànyɔ̀	eighteen
nyɔ̀gmã kɛ nɛ̃ɛ̃	nineteen
nyìgmítɛ̃ kɛ ékpà	thirty-six
nyìgminɛ̃ɛ̃ kɛ nɛ̃ɛ̃	ninety-nine

As can be seen from Table 17, the additive operation is morphologically coded by the mono-morphemic word *kɛ*. This makes the formation of Dangme additive complex numerals syntactic, since they are formed through coordination of two numerals. Numerals between '10' and '20', '30' and '40', '50' and '60'…… and '90' and '100' such as '11' and '17' have the structure of coordinate construction with the conjunction *kɛ* 'and', conjoining two numerals as shown in (1) below.

1. a. nyɔ̃ngmã kɛ̄ kake
   ten CONJ one
   'ten and one'
   b. nyɔ̃ngmã kɛ̄ kpààgo
   ten CONJ seven
   'ten and seven'

Any numeral between a decade numeral and the next decade numeral is usually expressed in terms of coordinate construction. Also, numerals between '100' and '1000' such as '101', '110', '119' and '122' are expressed in coordinate constructions. Additive numerals in the language are consistent with the observation of Booij (2009) about Dutch additive numerals. He maintains additive numerals are complex linguistic expressions "that are formed by an iterative rule system which enables the language user to form numeral expressions in an infinite number, in principle" (Booij 2009: 5). The examples in (2) below also show additive numerals in Dangme with the conjunct *kɛ* 'and'.

2. a. làfá kɛ̄ káké
hundred CONJ one
'hundred and one'

b. làfá kɛ̄ nyɔ̀̃ngmɔ́̃
hundred CONJ ten
'hundred and ten'

c. làfá kɛ̄ nyɔ̀̃ngmɔ́̃ kɛ̄ nɛ̃̄ɛ̃.
hundred CONJ ten CONJ nine
'hundred and ten and nine'

d. làfá kɛ̄ nyɪ̀̃ngmɪ́̃nyɔ̀̃ kɛ̄ énɔ̀̃.
hundred CONJ twenty CONJ two
'hundred and twenty and two'

To accurately understand the numerals denoted in the coordinate constructions, especially when the conjunction is more than one, we need to start from the left and add whatever comes after the conjunction to what precedes it.

According to Booij (2009:9) numeral expressions can project phrases and therefore they have a syntactic representation. Özgün (2016:133) posits that "in order to support the argument that numeral expressions do have a syntactic structure we need an approach that can explain this representation". In this regard, Hurford's (1987) "Packaging Strategy" (PS) can help us to explain the formation of the additive complex numerals in Dangme. According to Hurford (2007: 773) PS "is a universal constraint on any system, which uses syntactic structures to specify advanced number systems, i.e. the operations of addition and multiplication." PS originate from transformational grammar framework and seeks to present the rules that generate all numeral expressions in an economic fashion without compromising semantic acceptability (Hurford: 2007: 774). PS asserts that all numeral expressions in natural languages are

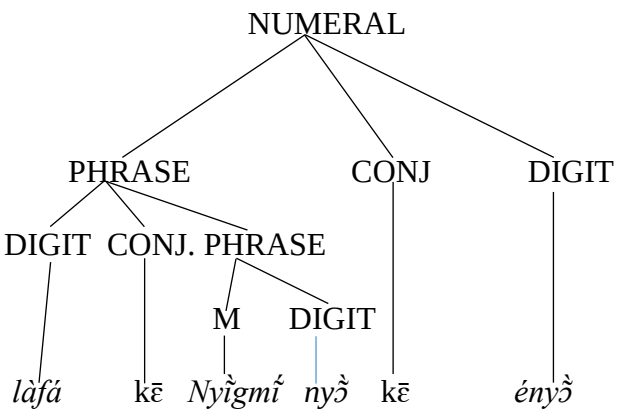
generated according to a small set of Phrase Structure Rules (PSR) as shown in (3).

3. MUMBER → DIGIT / PHRASE (NUMBER) (interpreted as addition)

PHRASE → (NUMBER) **M** (interpreted as multiplication)

The **DIGIT** in the rule represents cardinal numerals such as *one, two, three* and *four*. **M** is a multiplier such as *hundred, thousand, million* and *billion.* The rule shows that "a numeral may comprise of a single DIGIT as well as a PHRASE or PHRASE and NUMBER. The PHRASE may comprise of an M or an M and a NUMBER" (Hurford, 2007: 774). The rule in (3) is a recursīve one and, therefore, can be used again and again to form all numeral expressions in a language (cf. Özgün 2016:133). In examples (2c) and (2d), we observe that the phrase *làfá kɛ̄ nyɔ̀ngmɑ́* 'hundred and ten' forming a phrase with *nɛ̃̄ɛ̃̄* 'nine', a DIGIT. The structure of example (2d), *làfá kɛ nyɪ̀ngmɪ́nyɔ̀ kɛ ényɔ̀* 'hundred and twenty two' is shown in (4) below.

4.



In examples (1) and (2), internal commutability is prohibited and the linear order of the conjuncts is fixed so that if the order in which they occur is reversed, the structure becomes unacceptable, as shown in (5) below. Similarly, the omission of the conjunction may also result in the formation of a completely different numeral as shown in (6a) or an ill-formed numeral, especially when three conjuncts are involved as shown in (6b) below.

5. a. *káké kɛ̄ làfá
one CONJ hundred
'one and hunderd'
b. *nyɔ̀ngmã kɛ̄ làfá
ten CONJ hundred
'ten and hunderd'

6. a. Làfá kpáágō
hundred seven
'seven hundred'
b. *làfá nyɪ̀ngmɪ́nyɔ̀ ényɔ̀
hundred twenty two

As can be observed in (6a), the omission of the conjunction has resulted in the formation of numeral that has multiplication meaning (100*7). However in (6b), where the coordinate construction is more complex, with two conjunctions, the omission did not result in the formation of any numeral at all, as the resultant construction is unacceptable in the numeral system of the language.

5.2.1.2.2 Multiplicative complex numerals in Dangme

Dangme multiplicative complex numerals, unlike the additive ones that have the morpheme *kɛ* 'and', do not have multiplicative morpheme that multiplies the two numerals. This attribute of multiplicative complex numerals in the language places these numerals into the class of compounds words.

Multiplicative complex numerals in the language are formed by compounding of two numerals. A multiplicative numeral is a "numeral where the relation between component parts of the complex numeral is that of multiplication. The component parts are "multiplier" and "multiplicand" (Schapper & Klamer 2014: 289). So, for example, in the equation 10 x 3, the multiplier is 10 and the multiplicand is 3.

Multiplicative compound numerals in Dangme may be divided into two types: Lower multiplicative compound numerals and higher multiplicative compound numerals. A lower multiplicative compound numeral can be expressed as the multiplicative cardinals that form the numerals from twenty to ninety. In Dangme, they are formed by the use of the decade term *nyɛ̀̃gmɛ́̃* 'tens', an allomorph of *nyɔ̀̃ngmɑ́̃* 'ten', multiplied by the basic cardinal numerals (two, three, four, five, six, seven, eight and nine) respectively as shown in the Table 18 below.

Table 18. Dangme lower multiplicative complex numerals

Numeral	Translation
nyɛ̀̃ngmɛ́̃ ényɔ̃	twenty
nyɛ̃̀ngmɛ̃́ étɛ̃	thirty
nyɛ̃̀ngmɛ̃́ éwíɛ̀	forty
nyɛ̃̀ngmɛ̃́ énɔ̃̀ɔ̃	fifty
nyɛ̃̀ngmɛ̃́ ékpà	sixty
nyɛ̃̀ngmɛ̃́ kpààgō	seventy
nyɛ̃̀ngmɛ̃́ kpàànyɔ̃	eighty
nyɛ̃̀ngmɛ̃́ nɛ̃́ɛ̃́	ninety

Higher multiplicative compound numeral may be expressed as multiples of hundred and thousand. In the formation of these complex numerals, the basic numerals are combined with *làfá* 'hundred' and àkpé 'thousand' to form multiples of hundred and thousand. In their structure, like the lower multiplicative numerals, the basic numeral (unmotivated) occurs as a right-hand constituent and modifies the left-hand constituent by establishing the number of times or collections of the left-hand constituent. Table 19 below illustrates Dangme higher multiplicative numerals.

Table 19. Dangme higher multiplicative complex numerals

Numeral	Translation
làfá káké	one hundred
làfá ényɔ̃	two hundred
làfá étɛ̃	three hundred
làfá éwíɛ̀	four hundred
làfá énũɔ̃	five hundred
làfá èkpà	six hundred
làfá kpààgō	seven hundred
làfá kpàànyɔ̃	eight hundred
làfá nɛ̃ɛ̃	nine hundred
àkpé káké	one thousand
àkpé énɔ̀ɔ̃	two thousand
àkpé étɛ̃	three thousand
àkpé éwíɛ̀	four thousand
àkpé énɔ̂ũɔ̃	five thousand
àkpé ékpà	six thousand
àkpé kpààgō	seven thousand
àkpé kpàànyɔ̀ɔ̃	eight thousand
àkpé nɛ́ɛ́	nine thousand

5.2.1.3 Multiplicative Complex numerals as compounds in Dangme

In Tables 18 and 19 above, we observe that the multiplicative complex numerals form compounds in the sense that the two cardinal numerals that

name the figure, unlike those in Table 17, are juxtaposed without any intervening morpheme that encodes the multiplicative operation. Thus, following Hurford (1987: 8) "a number x is named by an expression whose constituents are the names of the numbers y and z." Dangme numeral compounds are presented in Table 20 below.

Base 1	**Gloss**	**Base 2**	**Gloss**	**compound**	**Translation**
nyĩ̀ngmì̀	decade	ényɔ̃	two	nyĩngmĩnyɔ̃	twenty
nyĩ̀ngmì̀	decade	etɛ̃	three	nyĩngmĩtɛ̃	thirty
nyĩ̀ngmì̀	decimal	éwíɛ̀	four	nyĩngmĩwíɛ̀	forty
nyĩ̀ngmì̀	decade	énũ̃ɔ̃	five	nyĩngmĩnũ̃ɔ̃	fifty
nyĩ̀ngmì̀	decade	ékpà	six	nyĩ̀ngmĩ̀kpà	sixty
nyì̀ngmĩ	decade	kpààgo	seven	nyĩ̀ngmĩ̀kpààgo	seventy
nyĩ̀ngmì̀	decade	kpàànyɔ̃	eight	nyĩngmĩ kpàànyɔ̃	eighty
nyì̀ngmì̀	decade	nɛ̃ɛ̃	nine	nyĩngmĩnɛ̃ɛ̃	ninety
làfá	hundred	ényɔ̃	two	làfɛ́ɛ́nyɔ̀	two hundred
làfá	Hundred	étɛ̃	three	làfɛ́ɛ́tɛ̃	three hundred
làfá	hundred	éwíɛ̀	four	làfɛ́ɛ́wíɛ̀	four hundred
làfá	hundred	énũ̃ɔ̃	five	làfɛ́ɛ́nũ̃ɔ̃	five hundred
làfá	hundred	ékpà	six	làfɛ́ɛ́kpà	six hundred
àkpé	thousand	énɔ̀	two	àkpéénɔ̀	two thousand
àkpé	thousand	étɛ̃	three	àkpéétɛ̃	three thousand
àkpé	thousand	éwíɛ̀	four	àkpééwíɛ̀	four thousand
àkpé	thousand	énũ̃ɔ̃	five	àkpéénũ̃ɔ̃	five thousand
àkpé	thousand	ékpà	six	àkpéékpà	six thousand

Table 20: Dangme multiplicative numeral compounds

Multiplicative numerals in the language are considered compounds not only on the basis of their syntax but also their phonology. This is because these compounds exhibit phonological processes that are found in compounding, not only in Dangme, but also in some Kwa languages, including Akan (Dolphyne 1988; Ofori 2008) and Lɛtɛ (Akrofi-Ansah 2012). Prominent among these

processes are vowel deletion and tonal processes (Akrofi-Ansah 2012; Dolphyne 1988; Ofori 2008).

We can observe from the foregoing discussion of numerals in Dangme that complex numerals are formed morphologically or syntactically. Their formation is subject to specific restrictions, especially on linear order and the presence of syntactic units (additive numerals). Violating these restrictions renders the construction ill-formed. To adequately account for the semantic properties of these numerals we need a framework that can account for both semantic and formal properties of these numerals. In showing this, I employ CxM which establishes that meaning components of words that cannot be traced to the constituents of the words should be understood as holistic constructional properties (cf. Booij 2010b; Goldberg 2006; Gurevich 2006).

5.2.1.4 Construction Morphology and Dangme compound numerals

Morphology is concerned with the internal structure of words. However, language users can only assign internal structure to a word if there is a systematic correlation between its form and meaning, based on the comparison of sets of word (Booij, 2016). Morphological construction schemas indicate how new words or (in the case of inflection) word forms of a certain type can be formed, and they have the function of motivation with respect to the set of existing complex words of a language, the conventional lexicon (Booij, 2016). The need for using the notion 'construction' in morphological analysis is that constructions, as envisaged in Booij (2010a), may have properties that do not derive from their constituents, and therefore are holistic in nature. As can be

seen in the multiplicative compounds, the operation of the multiplication is not traceable to any of the constituent numerals.

In situations like this, where the meaning of the compound is not related to the meaning of either constituent or to their combined meaning, or the meanings of the constituents do not exhaust the meaning of the compound, Appah (2016b: 19) proposes that "the extra-compositional meaning component be expressed as a semantic operator (the unindexed SEM) over the meaning of the compound, or the meaning of the relevant constituent". This is illustrated in (7) below. Schema adopted from Appah (2016b: 19)

7. $<[[a]_{Xi}\ [b]_{Yj}]_{Nk} \leftrightarrow [SEM_i\ [SEM]\ SEM_j]_k>$

In the schema in (7), *a* and *b* are two numerals with undexed SEM being the unexpressed multiplicative operation. An instantiation of the abstract schema (7), where the items that substitute for the variables *a* and *b* are numerals is shown in (8). Since the meta-schema of Dangme compounds bears an output category noun, which the subschema (for numeral compounds) does not override, we should expect that the output category of numeral compounds will be nouns as exemplified in (8) below with the multiplicative numeral *nyɛ̀̃gmítɛ̃* 'thirty'

8. $<[[nyɛ̀̃gmɛ́]_{Ni}\ [étɛ̃]_{Nj}]_{Nk} \leftrightarrow [SEM_i \text{ multiplied by } SEM_j]_k>$

nyɛ̀̃gmɛ́ 'decade' *étɛ̃* 'three' > 'thirty'

The occurrence of $_{Nk}$ on both schemas in (7&8) shows that the nominal syntactic category of Dangme compound numerals is inherited from the abstract meta-schema instead of the constituent numerals. This means that the formal property (nominal) of these compounds is properly construed as a holistic property of the compound itself and not the case of feature percolation. This observation therefore fits into the view of Booij (2012: 345) that "systematic properties of compounds need not be derived from the head, but can be seen as holistic properties of the compound construction."

5.2.1.5 Grammatical category of Dangme numeral compounds

Linguists who have studied numerals (eg., Booij 2009, 2010d; Hurford 1987; Özgün 2016; Von Mengden 2010; Wiese 2007) are not able to assign numerals to one discrete syntactic category. According to Appah (in print) numerals form a continuum between nouns and adjectives, with lower-valued numerals behaving like adjectives and higher-valued numerals, like nouns (cf. Booij 2009). Jespersen (1969: 119) commenting on the lack of discrete syntactic category for numerals for instance, maintains that "[n]umerals are generally treated as adjectives [...] but not infrequently the higher ones or some of them are substantives". However, the disagreement has been between nouns and adjectives, whether numerals are nouns or adjectives. This is because numerals exhibit characteristics that coincide with both. Hurford (1987:5) observes that "the category adjective appears to be more appropriate category for numerals given the link between meaning of words and their syntactic category and therefore the attribution of higher numerals to the class of nouns is a property to be explained."

Von Mengden (2010:259), commenting on the syntactic category of '(cardinal) numeral' based on semantic criteria, establishes that the "oft-cited parallels between numerals and adjectives and between numerals and nouns appears to be caused by either a particular number of syntactic uses of numerals or type of quantification". The attribution of numerals to either adjectives or nouns, according to Appah (in press), is usually "determined by an implicit criteria."

In this work, I have taken the position that Dangme cardinal numerals are nominal constructions for the reason that, they name entities. However, the referents of the numerals are numbers. Consider the sentences in (9) below.

9. a. Hɑ́ mī ɛ́tɛ̃.
   Give 1SG.OBJ three
   'give me three'
   b. hɑ́ mī làfɛ́-ɛ́nyɔ̀̃.
   give 1SG.OBJ hundred-two
   'give me two hundred'
   c. Àwó ngɛ̄ lɔ́lé ékpà.
   Àwó has lorry six
   'Awo has six lorries'
   d. Àwó ngɛ̄ lɔ́lé àgbò àgbò.
   Àwó has lorry big big
   'Àwó has big lorries.'
   e. *Àwó ngɛ̄ lɔ́lé ékpà ékpà.
   Àwó has lorry six six
   'Awo has six lorries'

The examples in (9a-c) reflect the use of numerals *ɛ́tɛ̃, làfɛ́-ɛ́nyɔ̀̃* and *ékpà* as indirect objects of the verbs *hɑ́* 'to give' and *ngɛ̄* 'to have', respectively.

Again, Dangme numerals (lower or higher) do not mark number agreement with nouns in NPs as do adjectives and, therefore, cannot be classified as adjectives. In example (9d), we observe that the adjective is reduplicated to mark number (plural) but as we attempt to reduplicate the numeral in (9e) for the same effect, the sentence becomes unacceptable.

Lastly, all Dangme cardinal numerals are nouns since a higher numeral can be coordinated with a lower numeral and considering the fact that only words of the same category can be coordinated, we have to conclude that Dangme numerals are nominals.

5.2.1.6 Headedness of Dangme numeral compounds.

The head of a compound is the constituent that shares it formal and/ or semantic properties with the compound (Appah 2016b; Bauer 2010b; Booij 2010c). Dada (2012: 52) posits that "speaking informally, we can say that the properties of the head are the properties of the whole constituent because it percolates to the other element with which it forms a compound. Thus, the category of compound word is determined by the category of its head." Fabb (2001: 67) however, observes that there are compounds "where there is some reason to think of both words (constituents of the compound) as equally sharing head-like characteristics". This type of compounds, he calls co-ordinate compounds.

With regard to Dangme multiplicative numeral compounds, none of the constituent numerals of these compounds can be considered the head. In other words, numeral compounds in Dangme do not show feature percolation as both the semantic and formal properties of these compounds cannot be deduced

mainly from one of the constituents. Dangme numeral compounds, therefore, fail the hyponymy test. Consequently, we may classify them as exocentric constructions. In characterising these compounds as exocentric, I have adopted the notion of exocentricity as defined by Appah (2016b), "the situation whereby a morphological construction lacks a semantic head element or a crucial feature needed for the full interpretation of the construction is external to the construction." (cf. Bauer, 2010b).

The interesting feature of Dangme numeral compounds, as far as headedness is concerned, is that their meanings are not totally transparent. Thus, the constituents and the whole may be related to some extent; however, a core semantic property in the compounds that enables the compounds to fully encode their referents (figure) does not emanate from their constituents. Adopting a framework that assumes that every feature of the compound must somehow be accounted for in the constituents to analyse numeral compounds will be a challenge (cf. Appah, 2016b).

In Table 20 above, we observe that the meaning of a Dangme canonical numeral compound is the multiplication of two cardinal numerals. It is clear also that the two numerals are juxtaposed without any overt morpheme that expresses or encodes the arithmetic operation between them. This second observation is found in Table 17, where the additive marker (the arithmetic operation of addition) in the language, *kɛ̄* 'and' occurs between the two numerals. The absence of multiplicative marker in the compound numerals therefore necessitates an effectual framework that would help us to account for the covert multiplicative operation. It is for that CxM is most adequate.

5.3 Phonological Processes in Dangme Compound

Compounding has been noted to trigger phonological process (Aliero 2013; Anderson 2013; Akrofi-Ansah, 2012; Dada 2012). This section study looks at the phonological processes that are conditioned by the phenomenon of compounding. The study of these phonological processes will reveal, to some extent, the interface between morphology and phonology in the grammar of Dangme.

Phonological processes that occur in compounding of words in Dangme include vowel deletion, vowel coalescence, vowel lengthening, vowel shortening and tonal changes. This section seeks to describe these phonological processes as they occur in Dangme compound words.

5.3.1 Vowel deletion in Dangme compounds

Vowel deletion in Dangme compounds occurs when the concatenation of two bases results in a hiatus. Vowel hiatus (two adjacent vowels or a sequence of two vowels in different syllables) is a very common phonological phenomenon in many languages including Ewe (Motte 2013), C'lela (Aliero 2015) and Yoruba (Dada 2012). The Environment for vowel hiatus as discussed in this thesis is the juxtaposition of different or same lexical categories (noun, verb, adjective) in the formation of compounds in Dangme.

Dangme prefers CV syllables and so in situations where repairing of hiatus to create the preferred CV structure is possible, deletion strategy is employed. Consider the following Dangme compounds in (10).

10.	a.	*nyɪ̀̃gmɪ́ +étɛ̃*	'decade + three'	*nyìgmítɛ̃*	'thirty'
	b.	*nyɪ̀̃gmɪ́ +ékpà*	'decade + six'	*nyìgmɪ́̃kpa*	'sixty'

c. *lɔ́lé* +*éhé* ‘vehicle + new’ *lɔ́léhé* ‘new vehicle’

The process of resolving vowel hiatus in Dangme always deletes one of the two adjacent or juxtaposed vowels, usually the second vowel, which also begins the second lexical item. The similarity in Dangme hiatus resolution strategy in compounds to Lɛtɛ (Akrofi-Ansah 2012) and Yoruba (Dada 2012) is shown in examples in (11) and (12), respectively.

11. a. *ó-wúrɛ̀* ‘SG-chief’ + *ə́wú* ‘home’ *ówúréwù* ‘palace’

b. *sùkúú* ‘school’ + *ø-tsá* ‘SG-house’ *sùkúútsà* ‘school building’

(Akrofi-Ansah 2012:118)

12. a. *ya* ‘wife’ + *ọba* ‘king’ *ayaba* ‘queen’

c. *ọ̀ga* ‘master’ + *ogun* ‘war’ *ọ̀gágun* ‘general’ (Dada 2012:46)

The Ewe example in (13), however, differs from that of Dangme, Lɛtɛ and Yoruba as the deletion targets the final vowel of the left-hand constituent.

13. a. *ɸle* ‘buy’ + *awu* ‘shirt’ *ɸlawu* ‘buy dress’

b. *koko* ‘cocoa’ + *agble* ‘farm’ kokogble ‘cocoa farm’ (Motte 2013:30)

5.3.2 Vowel coalescence

Vowel coalescence is a phonological phenomenon in which contiguous segments merge to form a new segment that shares features with the merged segments (Oyebade 1998:68; Schane 1973:55). It is a common phenomenon cross-linguistically (Harford 1997). Vowels that coalesce may come to be adjacent to each other because the morphemes they belong to have been joined

or because they occur at the end and the beginning of adjacent words. This phenomenon is observed in compounding of words in Dangme.

In Dangme, the vowel /e/ does not follow /a/. Thus, in a situation where these vowels occur in the sequence /*ae/*, there must be a way of repairing the marked sequence. The language, however, adopts the strategy of selecting a new sound that shares some features with the sounds in the unacceptable sequence. The selection of /ɛ/ which is between /a/, a low front oral vowel and /e/, mid-high front oral vowel is appropriate as it falls between the two sounds in terms of height.

Anytime the left-hand constituent of a compound ends with the vowel /a/ and the right-hand constituent begins with the vowel /e/ the two vowels coalesce to /ɛ/ as shown in numeral compounds involving the numeral *làfá* 'hundred' whenever it combines with another numeral that begins with the vowel /e/ as exemplified in (14) below.

14. a. *Làfá* 'hundred' + *étɛ̃* 'three' > *làfɛ́étɛ̃* 'three hundred'
    b. *Làfá* 'hundred' + *éwìè* 'four' > *làfɛ́éwìè* 'four hundred'
    c. *Làfá* 'hundred' + *énũ̃ɔ̃* 'five' > *làfɛ́énũ̃ɔ̃* 'five hundred'
    d. *Làfá* 'hundred'+ *ékpà* 'six' > *làfɛ́ékpà* 'six hundred'

The examples in (14) involve coalescence at the juncture between the final vowel /a/ of the cardinal numeral *làfá* 'hundred' and the initial vowel /e/ of the basic cardinal numerals two to six which immediately follows it.

Comparing examples in (14) with (10), we can observe that the combination of the two lexical items creates a hiatus of two vowels. However,

in example (10), the initial vowels of the right-hand constituents are deleted instead of coalescence taking place. It appears from the observation that the language prefers coalescence over deletion. The front vowel /ɛ/ between /a/ and /e/ replaces the two vowels, /a/ and /e/. The vowel /a/ with the features [+Low, -ATR] and the vowel /e/ with the features [-Low, +ATR, -High] then coalesce to /ɛ/ with the features [-Low, -ATR, -High]. Thus, the resultant vowel after the coalescence shares the -ATR feature of the vowel /a/ and the -Low, -High features of the vowel /e/.

In the examples in (10), however, there is no sound, in terms of height that mediates the two adjacent vowels, /i/ and / e/ in terms of height, and hence coalescence does not take place. This leaves deletion as the only available option for repairing the hiatus. Though the sequence /*ie/* is permissīble in a word like *wìé* 'house' and *wíé* 'palm nut', it is unacceptable across morpheme boundary and hence the resolution.

Languages in the world have different means of resolving the hiatus. Some of these correction mechanisms include deletion of one of the vowels and epenthesisin order to break the cluster. Which material is deleted or is epenthesised is thus language specific. Resolving hiatus in Dangme as shown in the discussion involves vowel deletion and vowel coalescence.

5.3.3 Vowel Lengthening

It is well established that languages make use of phonetic duration to signal lexical contrasts. In Japanese, the form *[no]* 'field' with a short vowel contrasts with *[noo]* 'brain' with a long vowel. Languages can also use phonetic duration to signal a different kind of meanings (eg., emphasis). For instance,

English speakers can say *He's sooooo cool* to emphasize the degree of their belief of coolness. In Dangme, duration of vowels sometimes signals lexical contrast. Thus, any Dangme speaker knows that the forms *tó* 'to iron' and *tóó* 'staringly' are different lexical items.

Vowel lengthening is a phonological process whereby the duration of articulating a vowel is elongated in a particular context or environment. Vowel lengthening in Dangme is observed when there is vowel coalescence in compounds. Considering the examples in (14), it is observed that the vowel /ɛ/ between the two morphemes has been doubled. The doubling of the vowel in this context is considered a case of vowel lengthening. Let us consider the examples in (15) below.

15. a. *Làfá* 'hundred' + *étɛ̃* 'three' > *làfɛ́étɛ̃* 'three hundred'
    b. *Làfá* 'hundred' + *éwìɛ̀* 'four' > *làfɛ́éwiɛ* 'four hundred'
    c. *Làfá* 'hundred' + *énũ̀ɔ̃* 'five' > la̰fɛ́énũ̀ɔ̃ 'five hundred'

It has been argued already that the merging of the final vowel of the left-hand members of the compounds and the initial vowels of the right-hand constituents is a case of coalescence. However, in addition to the process of coalescence, we can observe the change of the vowel length represented by the doubling of the vowel.

The coalescence of the two adjacent vowels requires a re-syllabification. Two vowels have now become one and there must be a way of compensating for the loss of one vowel. The problem, however, is to provide an answer to the question of which of the two vowel positions needs to be filled and therefore

conditions the lengthening? In the compound *nyɛ̀gmɛ́́kpà* 'sixty' [*nyɛ̀gmɛ́* 'decade' + *ékpà* 'six'], we can observe the initial vowel of the right-hand constituent, which forms a V syllable is elided; however, this does not trigger any compensatory lengthening. It therefore appears that, in Dangme, compensatory lengthening is not triggered by just a loss of vowel but the quality of the missing vowel. Thus, it appears that the vowel /a/ has some qualities that need to be compensated after coalescence and that has triggered the vowel lengthening in the examples in (15).

5.3.4 Tonal changes in compounds.

In tonal languages, whenever two words are combined to form a compound, there are different tonal processes that are triggered. These processes include tonal assimilation and re-association.

Dangme compounds, like those in Akan, trigger tonal changes on words. Most Dangme verbs end with high tone vowels. This is evidenced in the verbs *gbá* 'to split', *mɑ́* 'to build', *dṹ* 'to plant', *yàá* 'to go', *yé* 'to eat' and *fiá* 'to hit'. In the formation of N-V compounds in the language, the abstract schema for complex nominal formation supplies the bilabial nasal /m/ which carries a low tone (cf. Dakubu, 1987). The low tone on the bilabial nasal spreads regressively to the preceding high tone of the verbs' final vowel. For instance, in the compound *pàyàm̀* 'water fetching' [lit.river going] which is formed from *pà* 'river' + *yàá* 'go', we observe that the high tone on the final vowel of the verb changes to low tone. The lowering of the high tone of the final vowel of the verbs of N-V compounds is illustrated (16) below.

16. a. tsũ 'house' + mɑ́ 'build' *tsũmàm̀* 'house building'

b. nɔ́ ‘thing’ + yé ‘to eat’ *nɔ́yèm̀* ‘eating’
c. dò ‘drum’ + fiá ‘to play’ *dòfiàm̀* ‘drumming’
d. pú ‘bush’ + gbàá ‘to weed’ *púgbàm̀* ‘bush weeding’

From the examples in (16), we can observe verbs that end with two vowels with the final vowel carrying a high tone. During compounding, the final vowels of the verb constituents which carry a high tone are deleted. The low tone of the bilabial nasal that comes with the abstract schema that N-V compounds instantiate spreads unto the preceeding high tones of the verbs causing them to change into low tones.

Commenting on the tonal processes that are conditioned when two words are combined in Lɛtɛ, Akrofi-Ansah (2012) observes that low tones on uninflected verb stems change to high tones when a verb forms a compound with a noun. Tonal process of compound words in Dangme, however differ from Lɛtɛ, in the sense that while in Dangme N-V compounds, tone changes from high to low, that of Lɛtɛ changes from low to high.

Another difference between the two languages is that whereas tones do not change in Dangme N-N compounds, Akrofi-Ansah (2012) observes, about N-N compounds in Lɛtɛ, a lowering of the final tone of the second constituent together with either progressive or regressive spreading of ATR feature.

5.3.5 Conclusion

Compounding in Dangme, although a morphological process, touches on other levels of the grammar of the language including the phonology. This section of the study has examined the phonological processes that are triggered when two lexical items are combined to form a compound. The study reveals that

compounding in Dangme usually conditions phonological processes like vowel deletion, vowel coalescence, vowel lengthening and high tone lowering. The analysis on the phonology of Dangme compounds has shown that to adequately account for compounding in the language, one needs to understand the phonology of the language.

On the phonological process of vowel deletion, I have argued that CV syllable is the preferred syllable structure in the language and therefore when the concatenation of two words in Dangme causes the juxtaposition of two vowels at the boundary between the two constituents, the initial vowel of the right-hand constituent is deleted to repair the hiatus.

Vowel coalescence, as shown, has been argued to be triggered by a morphophonological environment whereby deletion seems to be dispreferred or blocked by the intrinsic property of the final vowel of the left-hand constituent and the initial vowel of the right-hand constituent forcing the two vowels to compromise on some of their features to assume a neutral sound, /ɛ/ that shares some features with both sounds, /a/ and /e/, which coalesce.

The analysis has also shown that when coalescence occurs across word boundary in Dangme, it triggers vowel lengthening. This occurs when the neutral vowel that takes the position of the two adjacent vowels doubles in the orthography and phonetically elongates to compensate for the two vowels whose position has been taken by a single vowel.

The section has also revealed that N-V compounding in Dangme triggers tone lowering. This phonological process occurs when the low tone on the bilabial nasal, /m/ found on most Dangme nominals that name activities, spread regressively to the floating or high tone of the final vowel of the verb. It has

been shown that when the verb constituent of Dangme N-V compounds ends with a complex vowel, as seen in the words *gbèé* ‘kill’ and *fìá* ‘hit’, the final vowel is deleted.

5.4 Chapter Conclusion

This chapter has examined Dangme numeral compounds and the morphophonology of the compounds. It has been revealed in the discussion on the analysis of Dangme numeral compounds that they are formed through the concatenation of two numerals without any overt morpheme that encodes the arithmetic operation that underlies their formation. The covert arithmetic operation that underlies these compounds is that of multiplication. It has been shown also that among the various numerals, only multiplicative numerals are formed through compounding. Thus, I have argued that multiplicative complex numerals are formed morphologically. It has been shown that Dangme numeral compounds trigger vowel deletion, vowel coalescence and vowel lengthening when the left-hand numeral ends with a vowel and the right-hand numeral also begins with a vowel.

The chapter further discusses high tone lowering of the final vowels of verb when they combine with nouns to form nominal compounds that name activities. The lowering of tone is caused by a regressive spread of low tone on the bilabial nasal that is associated with the schema that these N-V compounds instantiate.

CHAPTER SIX

SUMMARY AND CONCLUSION

6.1 Introduction

The purpose of the present study was to identify complex words in Dangme that are formed by the combination of two lexemes and to analyse their nature to ascertain how similar or different they are from what has been discovered about their counterparts in other languages. Particularly, the thesis sought to find out the nature of Dangme compounds by investigating their structure and formation as well as the pertinent features that distinguish them from other complex structures like NPs and derived nominals in the language. Also, this work had intended to unravel the systematic formal and syntactic relations between the constituents of Dangme compounds, and between the compounds as morphological constructions and the bases from which they are formed. The current chapter summarizes the principal issues of the various chapters, what the study has revealed about compound words in Dangme and suggests areas for future study. In section 6.2, I present a summary of the preceding chapters while in section 6.3 and 5.4, I present the contribution of this study to knowledge and recommendations for future studies respectively.

6.2 Summary of the chapters

In chapter one, I introduced the subject matter of the study. I showed that compounding is a non-affixal derivational morphology in the sense that the forms that combine to form compounds are not affixes but lexemes that are meaningful in isolation. The chapter showed that though compound words have been investigated in languages, that of Dangme have receive little

attention and therefore needed to be studied to unravel their nature and some morpho-phonological processes they trigger. Thus, the purpose of the study, research questions and objectives as well as the methodology of the study were presented in chapter one.

In chapter two, I discussed some of the pertinent issues in the literature concerning compound words. I discussed the definition of compounding as presented by different researchers and pointed out that the lack of agreement among linguists on what constitutes a compound emanates from the disagreement on a common term to refer to constituents of compounds. Following Bauer (2006), I argued that, various names (stem, root, bases, words etc) were used to describe compound members in the literature because the researchers were exposed to data from different languages. Hence, as observed by Fábregas & Scalise (2012), compound members appear differently in various langauages and therefore language specific definition is required for compounds and their constituents.

On the classificatiion of compounds, it became clear from the literature that three kinds exist: classification based on the category of constituents that form the compounds (N-N, N-V, N-A, A-N etc), classification based on the categories of the compound words (nominal compounds, adjective compounds, verb compounds etc.) and classification based on headedness (endocentric and exocentric). Regarding headedness of compounds, a distinction was made between formal and semantic head, though both may cluster on one constituent. Concerning the morpho-phonological processes that are triggered by compounding in languages, vowel deletion appears to be common among

other processes, including vowel harmony, consonant assimilation and metathesis.

I also presented a discussion on the theoretical framework for the thesis in chapter two. I argued that CxM with it's tenents (the theory of word structure and lexicon) helps us to adequately account for constructions whose meaning cannot be worked out from their constituents. I argued that the meaning of any morphological construct is a property of the construction and may not necessarily be a function of the meanings of the individual constituents (Booij 2010b) and therefore, unlike the morpheme-based approach that looks at the meaning of complex words by breaking them into their constituent morphemes, CxM analyses words holistically. Citing problems such as allomorphy, zero morphemes and empty morph of the morpheme-based approach to morphological analysis, I argued that CxM is an ideal theory for the analysis of the data for the study. This is particularly so because, CxM is capable of analysing exocentric compounds which apear problematic for morpheme-based approaches.

In chapter three, I used both formal and semantic criteria to show how one could dertermine the compound status of words in Dangme. I showed that while constituents in Dangme compounds are lexemes, there are constituents in derived nominal complex words that are bound morphemes. For instance, the agentive morpheme, *lɔ* and the clitic form [m] of the relator noun *mi* 'inside' are used to derive nominals through affixation. I showed in the discussion that compounds in Dangme may trigger vowel deletion when the constituents are written together and their combination creates a hiatus. It was pointed out that while non-head modification of Dangme NPs is possible, compounds in

Dangme do not allow non-head modification. On the semantic criteria for determining the compound status of Dangme words, I followed Nwaozuzu (1991) and argued that a Dangme complex nominal may be considered a compound if it satisfies any three of the following: (i) unity of concept, (ii) semantic specialization, (iii) permanent aspect, and (iv) unitary representation of concept. I pointed out that we need a combination of two or more of these criteria (formal and semantic) to be able to judge the compoundhood of a Dangme word.

Regarding the classification of Dangme compounds, N-N, N-P, N-A, N-V and V-N compounds have been identified. I argued in the discussion that, though the constituents of the compounds vary in terms of the category and semantic properties, there is always a relation between them and this relation sometimes determines the acceptability of compound words in the language. Relations including *ingredient of, part of, location of* and *nature of* were identified between N-N compounds. I showed that though most of the constituents of Dangme compounds are simplex, the nominal constituents could be compounds or derived nominals.

On the category of the Dangme compound word, I argued that all Dangme compounds, irrespective of the word class of the compound members, are nominals and therefore compounding in the language is a nominalisation process.

Concerning headedness of Dangme compounds, I showed that some compounds have heads which may be the left-hand or the right-hand member of the compound. I argued that exocentric compounds in Dangme are caused by the fact that some constituents, especially adjectives, lose their core

semantic properties in the compounds they form. There are meaning components that occur in the compounds that need to be taken as constructional properties of the compounds because they cannot be traced to either of the compound members. Bahuvrihi and exocentric synthetic compounds were identified in the Dangme.

In chapter four of the study I examined Dangme numeral compounds and some phonological processes that are identifiable in Dangme compounds. Concerning numerals in Dangme, I showed that there exist unmotivated mono-morphemic numerals (eg., *ényɔ* 'two', *nyɔgmɑ́* 'ten', *làfá* 'hundred, etc), those that exist as syntactic constructions in the form of co-ordinate structure (eg., *nyɔgmɑ́ kɛ étɛ̃* 'thirteen', *làfá kɛ nɛ́ɛ́* 'hundred and nine, etc) and those that are formed through compounding (eg., *nyɪ̀ngmɪ́nyɔ̀* 'twenty', *nyɪ̀ngmɪ́ nɛ̃ɛ̃* 'ninety', làfɛ́ɛ́nyɔ̀ 'two hundred'). Using the CxM formalism to account for Dangme multiplicative numerals, I showed that there is no overt morpheme to encode the multiplicative meaning in these compounds and therefore the multiplicative meaning that these compounds evoke must be understood as constructional property of the schema that is instantiated by these compounds.

Discussing the phonological processes that are triggered during compounding of Dangme words, I identified vowel deletion, vowel coalescence, vowel lengthening and tonal changes. Concerning vowel deletion in Dangme compound words, I showed that when a base (lexeme) that ends with a vowel is added to another that begins with a vowel, and the two words are written together, a hiatus is created which then triggers the deletion of vowel that begins the second constituent (eg., *nyɪ̀gmɪ́* 'decade' + *ékpà* 'six' → *nyɪ̀gmɪ́kpa* 'sixty'). Regarding vowel coalescence in Dangme, I pointed out that

the process is triggered when the vowels /a/ and /e/ occur at word boundary of two constituents of Dangme compounds that are written together. In such cases the two vowels coalesce to /ɛ/ (eg., *Làfá* 'hundred'+*énũ̃ɔ̃* 'five' → *làfɛ́énũ̃ɔ̃* 'five hundred') (cf. Owulah 2014:88) . With vowel lengthening in Dangme compounds, I explained that they occur after vowel coalescence.

6.3 Contribution to knowledge

This study has brought out a new way of analysing Dangme morphological data as it is the first study to apply CxM formalism to Dangme data. In terms of its impact on Dangme linguistics, the thesis is the first study of Dangme compounds that seeks to unravel the nature of compounds as nominalisation process in the language. It thus provides responses to how to establish compoundhood of words in Dangme, how constituents of Dangme compounds are related and the relations that exist between compounds in the language and their constituents. Being the first study to have adopted word-based approach (CxM) to analyse Dangme compounds, the study has revealed how meanings of Dangme compounds that cannot be accounted for using compositionality principle can actually be explained. Using this frame work, the study has shown that Dangme compounds are not always compositional in terms of their formal and semantic properties and in such circumstances, we need to look beyond compositionality and assume that such extra, non-compositional properties are part of the schemas that these complex nominals instantiate. The CxM approach thus enables us to give adequate account of all manner of compounds that exist in Dangme. The study has contributed to the literature on

Dangme morphology and will therefore serve as a reference material on future studies on Dangme morphology.

To the study of linguistic in general, the present study has added to argument supporting the need to adopt constructional approach to the study of linguistic structures, particularly, morphology. The application of CxM to Dangme data in investigating issues in compounding, such as interpretation and headedness, has shown that the theory is credible in analysing data in variety of languages. The work has shown that constituents in compounds may lose their core semantic properties and therefore challenges the morpheme-based or bottom up approaches to morphological analysis to consider word-based or top-down approach since some properties of the complex nominals (compounds) are not traceable to their constituents and some properties of lexemes in isolation are not accessible in compounds.

6.4 Recommendation for future studies

Dangme is a three-level tone language and it is expected that tone plays a key role in both semantic and formal properties of linguistic constructions in the language. Due to the limitation of time and space, this current study couldn't analyse into detail how tonal melodies on words are affected during compounding. I therefore recommend strongly that subsequent studies access the tonal effects on compounds in terms of their formal and semantic properties and also how compounding in the language alter the tonal melodies on words in the language.

Considering what has been done I agree that the discussion on the phenomenon of compounding in the Dangme is exhaustive. There is the need

for a broader morphological study at a higher level than what has been done so far. A broader study of compounding in particular will enable a full comparison of the phenomenon in Dangme with other languages in the Kwa phylum. This will inform generalisation about the phenomenon in the Kwa languages.

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