Noun-Noun Compounds in Ewe

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This paper investigates noun-noun compounds in Ewe, a Kwa (Niger-Congo) language spoken in Ghana. It provides a broad description of their properties and categorises them according to the grammatical and semantic relations between their constituents. It is shown that Ewe noun-noun compounds may be grouped into attributive, subordinate (and coordinate) types based on the grammatical relationship between the constituents. An exploration of the semantic relation between the constituents leads to the identification of compounds whose constituents share relations, like ingredient-for, part-of, location for etc. Considering the overall semantics of the compounds, we identify the two principal types based on the presence of a head constituent – exocentric compounds whose meanings do not emanate entirely from their constituents, and endocentric compounds. The latter are further grouped into right-headed, left-headed (and dual-headed) compounds, based on the position of their head constituents.

Keywords: *Ewe, noun-noun compound, endocentric, exocentric, semantic relations*

1 Introduction

Compounds are words formed by combining two or more bases that potentially occur elsewhere in the grammar as syntactic atoms (Appah 2013a; Appah & Ansah 2020). They may be classified by various criteria, including using the syntactic category of the constituents, yielding noun-noun compounds (e.g., *school bus*), Adjective-noun compounds (e.g., *blackboard*), adjective-verb compounds (e.g., *whitewash*), etc. The purpose of this paper is to study Ewe noun-noun compounds like those in (1).

(1)	**Base$_1$**	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*kòkô*	cocoa	*àgblè*	farm	*kòkôgblè*	cocoa farm
b.	*àbólo*	bread	*ēwɔ́*	powder	*àbólōwɔ́*	bread flour
c.	*ètrɔ̃́*	fetish	*èʋú*	drum	*ètrɔ̃́ʋú*	fetish drum
d.	*ègbè*	bush	*àvú*	dog	*ègbèvú*	ruffian
e.	*èzɑ̃̀*	night	*èʋú*	vehicle	*èzɑ̃̀ʋú*	deceit
f.	*èzɑ̃̀*	night	*ēnú*	thing	*èzɑ̃̀nú*	bribe

Compounding has featured in studies on the grammar of Ewe which assert the existence of the process as a major word formation strategy in the language (inter alia, Duthie 1996; Ofori 2002). For example, discussing nominalization in Ewe, Ofori (2002) identified compounding as a major nominalisation process, listing the compounding of different constituents, including words such as nouns, adjectives, verbs, and postposition as well as noun phrases and verbid phrases.[1] However, compounding has not received much research attention. For example, until Agbadah's (2018) thesis on Compounding in Ewe which showed that it is a relatively productive lexeme formation strategy in the language, there was no detailed description of the nature of compound constituents in terms of word classes and their specific morphological properties. Neither did existing studies offer detailed classificatory account of Ewe compounds,

[1] She provides just two examples each, except compounding of verbs for which she provides three examples.

although the classification of compounds has been a central issue in the relevant linguistic literature (inter alia, Bloomfield 1933; Fabb 1998; Bisetto & Scalise 2005; Dressler 2006; Bauer 2009, 2010b; Lieber 2009; Scalise & Bisetto 2009; Marchand 1967, 1969).

Discussing compounding of nouns as a nominalisation strategy, Ofori (2002) cites the data in (2) and observes that:

> When nouns are compounded, the vowel prefix of the second noun together with its tone are elided. The final vowel of the initial noun with a rising tone also has the high part of the rising tone eliminated … In addition, the final vowel of the last noun with a rising tone also changes to a high tone.

(2)

	Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*(è)dě*	palm	*àtí*	tree	*(è)dètí*	palm tree
b.	*àgblɔ̄*	hook	*èvǔ*	drum	*àgblɔ̄ǔ*	type of drum supported by hooks

(Ofori 2002: 177).

Indeed, there seems to be some interesting interplay between tone and the phonetic properties of consonants in nominal bases which Ameka (1991) captures as follows:

> The tones of nominals are affected to some extent by the consonant of the stem. Thus nominals with a non-high toneme, may be realised as mid if the nominal root has a sonorant or a voiceless obstruent, for example: *āmē* 'person'; *āmi* 'oil, pomade'; *à-fī* 'mouse'. It is low if the consonant of the nominal root is a voiced obstruent, for instance, *èdà* 'snake'. For high tone nominals, the tone of the nominal root is high if the consonant is a voiceless obstruent or a sonorant as in: *ā-tí* 'tree' and *ā-yí* 'skin'. If the stem consonant is a voiced obstruent the tone is a low-high rising tone as in: *a-vɔ̌* 'cloth'. In context, this rising tone may change to low tone. This may happen when the word occurs before another syllable which is high. For example, note that the tone of the noun in the following is low as opposed to rising: *avò lá* 'the cloth'.
>
> (Ameka 1991: 37)

The quotations above illustrate the intricate relation between tone and the phonetic properties of the sounds that make up Tone Bearing Units (TBU), clearly showing the need for further studies on compounds in Ewe to assess their properties against crosslinguistic findings on the properties of compounds. Therefore, the aim of this paper is to contribute to the study of compounding in Ewe, focusing on noun-noun compounds. §2 briefly introduces the Ewe language. In §3, we discuss compounding in general, highlighting issues that have occupied researchers, including the definition, classification, and the nature of the grammatical and semantic relations between the constituents of compounds. Although there are appreciable levels of agreement among scholars on some of the issues that fuelled lively debates on compounding in the past, there are still outstanding issues like the usefulness of the category of exocentric compounds, the nature of the shared properties between compounds and their constituents and how to account for the shared properties, etc. However, a detailed assessment of the various views lies outside the primary descriptive goals of the present paper. Therefore, we approach the brief introduction to compounding in §3 as though there were consensus on the relevant issues, hoping to provide sufficient theoretical foundation for the descriptive goals of this study. In §4, we apply the issues presented in the preceding section to the analysis of Ewe noun-noun compounds. We identify various classes of Ewe noun-noun compounds and discuss their properties, excluding a detailed account of the phonology of the compounds which

we believe deserves a separate study because of the complex interaction between tone and the properties of especially consonantal sounds in compound constituents. §5 concludes the paper.

2 The Ewe language

Ewe is a Kwa (Niger-Congo) language spoken by about five million people in West African countries like Ghana, Togo, Benin and Nigeria. For this study, we draw data from the Ewe spoken in Ghana in coastal and inland parts of the Volta Region, in places like Ho, Kpando, Peki, Gbi, Adaklu, Wli, Aŋfɔɛ, Avenor, Ve, etc, (Duthie 1996: 2). The language has seven oral vowels [i, e, ɛ. ɑ, ɔ, o, u] with corresponding nasal vowels, although some studies (e.g., Agbadah 2018) list five nasal vowels [ĩ, ɛ̃, ɑ̃, ɔ̃, ũ]. Ewe also has twenty-seven consonants, featuring co-articulation (/kp/ and /gb/), a contrast between bilabial and labiodental fricatives (/ƒ/ & /f/ versus /ʋ/ & /v/), and between alveolar and retroflex stops (e.g., /d/ versus /ɖ/), etc.

Ewe is a tonal language with two basic phonemic register tones: low (e.g., *tɔ̀* 'buffalo') and high (e.g., *tó* 'mountain'). A third tone, mid (e.g., *tɔ̄* 'mortar'), is construed as a variant of the low tone (Ameka 1991).

The syllable, which is the TBU in Ewe, is obligatorily composed of a nucleus and a tone (cf. Duthie 1996; Agbedor 2006), and there are three basic syllable types with characteristic tones (see (3)). The onset and the coda are optional with most syllables in Ewe being open, and all pre-consonantal and post-consonantal as well as vocalic vowels and some nasal consonants (/m/ & /n/) being syllabic and tone-bearing (see Duthie 1996: 12).

(3)

Syllable Type/Description	***Example***		
a. Tone and nucleus only	*é* 'he/she/it'	*è* 'you-SG'	*ɔ̀* 'not'
b. One margin, tone and nucleus	*tó* 'to pound'	*fì* 'to steal'	*gbɔ̃̀* 'goat'
c. Two margins, tone and nucleus	*flè* 'to buy'	*dzrá* 'to sell'	*gblɔ̀* 'say'

The basic word order in Ewe is SVO, and the morphology is isolating with agglutinative features, employing processes like affixation, compounding, reduplication and triplication for word formation (Ameka 1999; Ofori 2002; Essegbey 2002; Agbedor 2006; Westermann 1930). Ewe also has ideophones, symbolic words which may code concepts like intensity, manner of motion, etc. (see Westermann 1930: 107-109). Nouns are typically characterized by a non-high tone vocalic prefix à- (*àgbè* 'life') or è- (*èdě* 'palm'), which are relics of Proto Niger-Congo noun class markers. The prefix *è-* tends to be elided even when the noun is used in isolation, e.g., *ā-mē* 'prefix-person' *(è-)glí* 'prefix-folktale'. However, there are temporal nouns whose High tone prefixes are never elided (e.g., *ázɔ́* 'now', *étó* 'tonite', and *égbè* 'today').

3 Compounding

Compounding forms words "by combining at least two lexemes of the same or different word classes" (Appah 2017b: 12). It is a very common and productive word-formation process cross-linguistically (Booij 1991; Guevara & Scalise 2009; Scalise 1992; Scalise & Vogel 2010; Lieber & Štekauer 2009; Appah 2013b; Lawer 2017; Nee-Okpey 2020; Babakyirenaa 2024; Lieber 1992; Agbadah 2018; Akrofi Ansah 2012; Ajiboye 2014). It has even been suggested to be a cross-linguistic phenomenon (Aikhenvald 2007), although there seems to be contrary evidence (cf. Štekauer et al. 2012). Compounding has, therefore, attracted extensive attention, focusing on different aspects of the phenomenon. They include the definition (Fabb 1998; Bauer 2001, 2006; Montermini 2010), classification (Bisetto & Scalise 2005; Dressler 2006;

Bauer 2009; Scalise & Bisetto 2009) and criteria for delineating compounds from derived words on the one hand (Bauer 2005; Ralli 2010; Hacken 2000) and phrases on the other hand (Spencer 1991; Appah 2019a; Bauer 1998; Bisetto & Scalise 1999; Giegerich 2004, 2005, 2008; Katamba & Stonham 2006; Olsen 2000; Ralli & Stavrou 1998; Scalise & Vogel 2010; Ackema & Neeleman 2010). Aside from linguistics, compounding attracts attention in fields like natural language processing (Jones 1983; Guevara et al. 2010) and cognitive science (cf. Libben & Jarema 2006; Dressler & Lettner 2010; Gagné & Spalding 2010; Gagné et al. 2010; Libben 2014).

In the rest of this section, we focus mainly on the classification of compounds and the noteworthy properties of the various types. The theoretically interesting issues of how to distinguish compound from phrase is not discussed in detail because we do not deal with the issue in our discussion of Ewe noun-noun compounds. However, we briefly mention some criteria that may be employed for this enterprise.

3.1 *Distinguishing compounds from phrases*

The question of how to distinguish between phrases and compounds is deemed important because of the obvious formal similarities between them, not least the fact that both have words (lexemes) as input; the former combines words to form phrases, while the latter combines words to form words. There are crosslinguistic and language-specific criteria which have become standard tests for establishing whether some group of lexical items constitute a phrase or a compound. They include the possibility of modifying the individual constituents in isolation if they are phrases, and the prohibition of the same in compounds because allowing it would amount to violating the supposed lexical integrity of the compound as a lexical item (see Ralli & Stavrou 1998; Appah 2016a, 2016b, 2019a). In some languages, including Dutch, internal inflectional marking may be used to distinguish compounds from similar-looking phrases (Booij 2002).

Another criterion is the possibility of some part of constituents (sound/syllable/ morpheme or some part not necessarily constituting a proper phonological or morphological unit) getting deleted in compounds rather than phrases (cf. Appah 2016a, 2019a; Dolphyne 1988; Abakah 2004). For example, the Ewe compound *àbɔ̀bɔ́gɔ̀* ‘snail shell’ is formed from *àbɔ̀bɔ́* ‘snail’ and *ègɔ̀* ‘shell’, but in the compound, the second constituent loses its prefix *è-*, and appears in the compounds as *gɔ̀*.

On semantic grounds, we may expect phrases to be generally transparent while compounds exhibit varying levels of semantic opacity resulting from lexicalization (Kavka 2009; Spencer 2011; Bauer et al. 2015; Appah 2016b).

Finally, some languages may have phonological cues for telling compounds apart from phrases, even though the jury is still out on the robustness of such phonological criteria (see Bauer 1998; Giegerich 2004, 2005, 2008; Abakah 2004, 2005, 2006; Marfo 2004; Owusu-Ansah & Appah 2024).

These and other tests will be applied in a later study to properly delineate Ewe compounds from phrases.

3.2 *Classification of compounds*

Compounds are classified based on a variety of criteria. Recognising that it is not just any two lexemes that can be combined to form a compound, it has been noted (Lees 1960; Downing 1977; Spencer 2011; Appah 2013b) that there must be some observable or conceivable relationship between the elements of a compound. As Downing (1977: 831) puts it, “any entity to be referred to as a compound participant participates in many relationships which, in absolute

terms, may serve as compounding relationships". Marchand (1969: 11) had earlier suggested that "the principle of combining two words arises from the natural human tendency to see a thing identical with another one already existing and at the same time different from it". Exemplifying this, Selkirk (1982: 22) argues that, "the compound *apron string* designates a *string* that is somehow related to an *apron*, by being attached to one, in the form of one, or whatever". The enabling relationships between compound constituents which can be semantic, as exemplified above, or grammatical, usually becomes the basis for classifying compounds. Thus, classes of compounds may share grammatical and/or semantic relationships.

At the heart of various approaches to the classification of compounds is the notion head which originally characterised the dominant member in an asymmetrical relationship within a syntactic construction (cf. Croft 2001: 241). The notion was explicitly applied to morphological constructions in the early 1980s (Williams 1981; Selkirk 1982) and defended strongly (Di Sciullo & Williams 1987; Štekauer 2000) against those who did not think that the notion applied to words the same way it did to syntactic constructs (Zwicky 1985; Bauer 1990). The notion is still central to morphological analysis, especially compounding for which even opponents of the idea of morphological headedness accept that it could be applied (Scalise & Fábregas 2010; Ralli 2013; Anagbogu & Omachonu 2012; Táíwò 2009; Andreou 2014; Arcodia 2012). However, unlike what obtains in syntax where the head of an XP is X^0, the head in compounding is defined positionally, as captured by one of the main proposals on morphological headedness, Righthand Head Rule (RHR), which suggests that the head of a morphological construction is the rightmost constituent (Williams 1981). It is that constituent which determines the properties of the whole, including the syntactic category and semantic (sub-)category of the complex word.

Indeed, across languages, we find evidence that compounds are mostly right-headed and that suffixes tend to be category-changing. For example, English *sea blue* is a type of *blue* while *blue sea* is a type of *sea*. Also, for the word *teacher*, the suffix *-er* appears to be the only potential source of the nominal syntactic category, given that the base *teach* is a verb. Similarly, affixal nominalisation in Ewe is almost entirely by suffixation. However, counterexamples abound across languages. In Akan, for example, all noun-adjective compounds are left-headed (Appah 2016b), and deverbal action nominalisation is achieved entirely through prefixation. Thus, notwithstanding the apparent strong evidence of right-headedness, questions remain about whether the notion *head* really applies to morphology, given that morphological headedness is defined positionally, a weakness which cannot be cured even by the suggestion that the position of the head is a parameter set, making a language either left-headed or right-headed. This is because there are languages with almost equal number of left-headed and right-headed compounds (Pepper 2010). However, the biggest challenge of the RHR is derivational morphology, because affixes have no "independently given specification of […] categorial value, and hence we have to encode the categorial properties on affix[es], which are then percolated […] to the dominating node of the whole complex word" (Booij 2002: 88).[2]

3.2.1 *Classification of compounds by grammatical relations between constituents*

The approach to the classification of compounds that looks at the grammatical relations between the constituents of compounds is founded on the view that the relations observed within syntactic constructions (subordination, attribution and coordination) seem to occur between the constituents of compounds as well (Jackendoff 2009b, 2010; Scalise & Vogel 2010). As Scalise and Vogel (2010: 7) put it, "[t]he types of relations found in compounds are comparable to those in syntax". Thus, for every compound, one can read an invisible syntactic relation as exemplified by the italicized functional items between the constituents; *taxi driver*

[2] Bauer (1990) critically assesses the applicability of the notion head to complex words, but see Štekauer (2000).

(driver *of* a taxi), *hard ball* (a ball *that is* hard), *poet painter* (poet *and* painter) and so on (cf. Scalise & Vogel 2010: 2). Based on this, compounds have been classified into three principal types – subordinate, attributive and coordinate compounds (Bisetto & Scalise 2005; Scalise & Bisetto 2009).

A subordinate compound is one in which the elements share a head-complement relation. It is particularly evident in the so-called synthetic compounds like *dish washer* where a deverbal head *washer* takes the other element *dish* as an argument, but also in verb-noun compounds like *pickpocket* and noun-noun compounds like *shoe lace* and *apron string* (Scalise & Bisetto 2009; Lieber 2010). Examples of noun-noun subordinate compounds in Ewe are found in (1a-c), repeated here as (4a-c) for convenience, including *kòkôgblè* 'cocoa farm' formed from *àgblè* 'farm' and *kòkô* 'cocoa', which specifies the kind of farm.

(4)	**Base$_1$**	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*kòkô*	cocoa	*àgblè*	farm	*kòkôgblè*	cocoa farm
b.	*àbólō*	bread	*ēwɔ́*	powder	*àbólōwɔ́*	bread flour
c.	*ètrɔ̃́*	fetish	*èʋú*	drum	*ètrɔ̃́ʋú*	fetish drum

In attributive compounds, the non-head constituent acts as a modifier and conveys a property of the head. This class tends to include noun-adjective and adjective-noun compounds like *sky blue* and *blue sky* respectively (cf. Scalise & Bisetto 2009; Appah 2016b; Scalise & Vogel 2010). Also in this class are noun-noun compounds like *snail mail* (a type of *mail* that moves metaphorically like a *snail*) because a property of the non-head *snail* (slowness) is ascribed to the head constituent *mail* which is slow, compared to *e-mail* (Lieber 2010). In Ewe too we find Noun-Adjective attributive compounds like *ētagã̀* (from *ēta* 'head' and *gã́* 'big') with the literal meaning 'big head', although, being an exocentric compound, the idiomatic meaning is a 'persons with a big head' (cf. Appah 2019b). Ewe examples of attributive noun-noun compounds are found in (1d-f), repeated here as (5a-c) for convenience. The compound *ègbèvu* 'ruffian' (5a) which is formed from *ègbè* 'bush' and *àvú* 'dog' with the literal meaning 'bush dog', refers to a *ruffian*. Examples (5b-c) are similarly amenable to both literal and figurative interpretations.

(5)	**Base$_1$**	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*ègbè*	bush	*àvú*	dog	*ègbèvú*	ruffian
b.	*èzɔ̃̀*	night	*èʋú*	vehicle	*èzɔ̃̀ʋú*	deceit
c.	*èzɔ̃̀*	night	*ènú*	thing	*èzɔ̃̀nú*	bribe

Regarding coordinate compounds, Scalise and Vogel (2010: 7) state that "the relation between the two constituents is one of coordination, typically conjunctive coordination (poet painter)". The constituents are equipollent in that they share head-like characteristics equally. Citing English examples like *producer-director*, *bluegreen*, and *doctor-patient*, Lieber (2010: 47) observes that "compounds of this sort can designate something which shares the denotations of both base elements equally, or is a mixture of the two base elements". It is for this reason that the compound may be said to be dual-headed (cf. Fabb 1998). However, it is not at all the case that all coordinate compounds are headed constructions because there are instances where the whole is exocentric in that none of the constituents is the head, considered from the overall semantics of the compound. For example, the compound *Accra-Kumasi* which occurs as modifier in the more complex attributive compound *Accra-Kumasi road* [[*Accra-Kumasi*]$_N$ *road*]$_N$ is neither *Accra* nor *Kumasi*. Rather, the compound refers to a road connecting the referents of the two constituents, *Accra* and *Kumasi* (cf. Bauer 2010a). Our research shows that such dual-headed coordinate compounds are rare in Ewe. However, in appropriate context,

àbàtí ‘bed’ (from *àbà* ‘mat’ & *àtí* ‘wood’) may be construed as dual-headed, as discussed further below.

3.2.2 *Classification of compounds by input and output syntactic categories*
As Appah (2013b) observes, one simple way to classify compounds is to use the form-class of the constituents, yielding noun-noun, noun-adjective, noun-verb, verb-noun, verb-verb, etc., or that of the output, yielding verbal compounds, nominal compounds, adjectival compounds, etc. In fact, there are languages like Akan, Ga, Esahie, Dagaare, etc., for which compounding is basically a nominalization strategy, so that no matter the combination of syntactic categories in the compound, the output will be a noun (Appah 2015, 2016a, 2016b, 2016c, 2017a, 2017b, 2019b; Lawer 2017; Broohm 2019; Nee-Okpey 2020; Lawer & Appah 2020; Babakyirenaa 2024). There is strong evidence that Ewe might be such a language too. As the title of the present paper shows, we are interested in noun-noun compounds, a class of compounds classified by syntactic categories whose output is a noun, like those exemplified above in (1).

3.2.3 *Classification of compounds by their semantic properties*
A third approach to classifying compounds pays attention to the semantics of the compound, considering whether there is a head constituent that determines the properties of the compound. This approach leads to a distinction between endocentric compounds and exocentric compounds (Bloomfield 1933; Allen 1978; Scalise & Guevara 2006). Endocentric compounds are headed constructions which are hyponyms of their head constituents, the ones which determine the core properties of the compounds (e.g., *school bus*, a type of *bus*), while exocentric compounds are headless constructions like *pickpocket* which is neither a type of *pick*, nor a type of *pocket*, but a person who picks pockets (Bauer 2008, 2009; Appah 2016c, 2017a, 2017b, 2019b; Appah et al. 2017). In the literature, we find further distinctions made between formal head which determines the formal properties of the compounds and semantic head which determines the semantic properties of the whole (Scalise & Guevara 2006; Bauer 2009; Guevara & Scalise 2009). There is even a further separation of the formal head into the syntactic head and the morphological head (Dressler 2006). Based on the distinction between formal and semantics heads, the difference between endocentric and exocentric compounds has been captured as follows:

> An *endocentric compound* has at least one formal head and at least one semantic head. If a compound has only one formal head and only one semantic head, then the two must coincide. If a compound realises any of the remaining possibilities, it will be considered to be *exocentric*.
>
> (Scalise & Guevara 2006: 192)

Concerning this approach to characterizing the distinction between endocentric and exocentric compounds, Bauer (2010b: 167) observed that endocentric compounds are defined as “compounds which are hyponyms of their head elements”, while exocentric compounds are usually defined negatively as the class that is left after endocentric compounds have been removed. What is significant about exocentric compounds, however, is that usually the meanings of exocentric compounds cannot be determined from their constituents only, because they tend to be hyponyms of some unexpressed semantic heads. This is the case for the compound *doctor-patient* which refers to some relation between the elements which is named by an external head element like *interaction*, as in [[doctor-patient]$_N$ interaction]$_N$.

Bauer (2008) posits a typology of exocentric compounds, identifying types like *bahuvrihi compound* in which a crucial property needed for the interpretation is not in the compound. An example is *bahuvrihi* itself which refers to ‘one who has much rice’, although

the literal meaning is just 'much rice'. So, no constituent bears the meaning 'one who has'. Another type is *metaphorical compound* like *dust bow* 'an area with no vegetation' which is said to be exocentric because, even though there is a head element, it must be interpreted metaphorically. A third type is the *transpositional compound* which is regarded as exocentric because the word class of the whole compound is different from that/those of the constituents. An example is Akan *dzima* 'advocacy/intercession' which is a noun formed from two verbs – *dzi* 'to eat' and *ma* 'to give' (Appah 2017a). The fourth type is the *synthetic compound* exemplified by *pickpocket* which refers to one who picks pocket, but there is no constituent which marks the doer of the action. The final type which is said not to be very common outside of Asian languages is the *co-compound* like Vietnamese *bàn-ghế* 'furniture' (*lit*. table+chair). "[T]he compound is not a hyponym of either element. Typically, the constituents individually denote examples of the denotatum of the compound" (Bauer 2008: 63).

Bauer (2008) posited subtypes of various exocentric compounds based on the word classes of the constituents (e.g., verb+verb bahuvrihi, noun+noun bahuvrihi) and the syntactic categories of the compound (e.g., nominal bahuvrihi, verbal bahuvrihi, etc.). Appah (2016c, 2017a, 2019b) also posited subtypes of Bauer's classes of the exocentric compounds based on their semantics, naming the subtypes after what is missing in the compound. For bahuvrihi compounds, the subtypes were possessive bahuvrihi and a non-possessive bahuvrihis (location, causer, etc.). For synthetic compounds, Appah posited action, agent and patient subtypes.

Thus, generally, a compound is said to be exocentric if a crucial property needed to interpret the compound is either not present in the compound at all or must be inferred so that the compound needs to be interpreted by some figure of speech. This is where the very existence of exocentric compounds has been questioned with researchers arguing that many morphological constructions are interpreted by figures of speech (Bauer 2008, 2016; Benczes 2015). Therefore, relying on figures of speech for their interpretation does not make the so-called exocentric compounds special, a position that resonates with cognitive approaches to the semantics of especially noun-noun compounds (Benczes 2005, 2006a, 2006b). Referring to the compound *dust bowl*, Bauer argues that it is "endocentric, but that *bowl* is to be interpreted metaphorically. The constituent *dust* modifies *bowl* in the construction *dust bowl* just as *fruit* modifies *bowl* in the construction *fruit bowl*; semantically, however, the *bowl* in *dust bowl* is not a literal dish, but something which resembles a dish" (Bauer 2008: 53).

While the view that exocentric compounds are not special because of how they are interpreted is valid, we believe that we need to know more about this class of compounds, and how they manifest across languages, as already advocated for in the literature (see Bauer 2008; Appah 2017a). For this reason, we discuss the types of exocentric noun-noun compounds found in our Ewe dataset.

3.2.4 *Concluding remarks on the classification and data sources*

Some criteria for classifying compounds run orthogonal to others so that classifications may involve more than one criterion at any time. Thus, we commonly find terms like endocentric N+N coordinate compounds, V+V endocentric compounds, etc. (cf. Lieber 2009: 359). In what follows, we discuss Ewe noun-noun compounds. We identify both endocentric and exocentric subtypes and discuss the formal and semantic relationships that underpin their formation and interpretation.

The study is based on a dataset of thirty-nine 39 compounds drawn from a variety of sources, including novels in Ewe (Agbezuge, Amedzro Etɔ̃lia), an Ewe language course book (Nunyamor), and published works like Ameka (1991), Duthie (1996) and Ofori (2002). Others were elicited from native speakers going about their normal daily duties. Fifteen of the constructs are usually regarded as noun-postposition compounds, however, we argue that they

are noun-noun compounds with location nouns as second constituents (Appah 2019b). Finally, we created some examples to help us test recursion in Ewe noun-noun compounds.

4 Ewe Noun-Noun Compounds

The present study examines noun-noun (henceforth, N-N) compounds in Ewe with the goal of establishing the nature of the formal structure of the compounds as well as the grammatical and semantic relationships that underline their formation. The class of compounds we are interested in has been defined simply as the concatenation of any two nouns to form a third noun (Downing 1977). We briefly deal with the formal structure of Ewe N-N compounds in §4.1, before discussing the various types of semantic relations between the constituents of the compounds in §4.2. In §4.3, we discuss headedness in Ewe N-N compounds leading to the identification of endocentric and exocentric types. We group the endocentric ones based on the position of the head constituent, yielding left-headed and right-headed subtypes. The doubtful status of the dual-headed type is also discussed. We end the section with a discussion of exocentric compounds. As noted above, we do not discuss the phonology of Ewe N-N compound. However, we comment on the systematic loss of the prefix of the second constituent when the first is vowel final.

4.1 *Structure of Ewe N-N compounds*

Words are either simple or complex. The former contains only one meaningful (i.e., grammatically functional) unit while the latter contains more than one such unit; a free form and an affix, forming a derived or inflected word, or two free forms, forming a compound. Katamba and Stonham (2006: 20) characterise a complex word as one which "can be broken down into smaller units that are meaningful", while Aronoff and Fudeman (2011: 261) define a complex word as "[a] morphological form that consists of more than one morpheme, whether it be two or more stems (compound word) or a stem plus one or more affixes, e.g., *bookstore*, *optimality*." However, others use *complex word* for only affixed words and not compounds. Spencer (1991: 5), for example, characterises a complex word as one that contains "a central morpheme which contributes the basic meaning, and a collection of other morphemes serving to modify this meaning in various ways".

Discussing the two positions, Braun (2009: 46-47) observes that the scope of what is covered will invariably be limited by the definition of morpheme which assumes a one-to-one correspondence between form and meaning à la Item-and-Arrangement morphology (cf. Hockett 1954), so that some form-meaning deviations may not be covered, including verb-to-noun conversions (e.g., $[\text{im}'\text{port}]_V \sim [{}'\text{import}]_N$), for which she observes that the nouns must be treated as complex because they are formed through stress shift. Following Plag (2003), therefore, she argues that, for current view of complex words to have broad enough coverage, morpheme should be "treated not only as visible elements, but also as processes rendering certain meanings, then converted words, truncations, blends, and words built by vowel alternation can be viewed as complex words" (Braun 2009: 46).

Ameka (1991: 56) identified simple and complex nouns in Ewe and observed that simple nouns are made up of a root and a vocalic prefix *a-* or *e-* (e.g., *ā-mī* 'oil', *è-gbè* 'bush', *è-dzè* 'salt'). Complex nouns, on the other hand, are formed from other words through nominalisation processes like reduplication (e.g., *dzo* 'leave' ~ *dzo-dzó* 'leaving'), suffixation of forms like *-lá* 'agent', *-ɸé* 'place' (*dzi-lá* 'bear-er, i.e. parent', *ɖu-ɸé* 'literally eat-place, i.e. portion (for consumption))', and through a combination of reduplication and suffixation (e.g., *dzodzó-lá* 'one who is leaving'). Clearly, Ameka's characterisation of words like *ā-mī*

'oil' and *ātí* 'tree' as simple is quite unusual, not matching either view on the distinction between simple and complex words above (cf. Spencer 1991; Katamba & Stonham 2006). It seems Ameka (1991) does not consider the prefixes, probably because they seem not to have contemporary grammatical significance beyond indicating that the base is a noun because even noun plurality is marked by the clitic *=wó*.

From the data, we observe both simple and complex nouns combining to form N-N compounds in Ewe. Two simple nouns, *dzò* 'fire' and *ēwɔ́* 'powder', combine to form the N-N compound *dzòwɔ́* 'ash' [*lit*. 'fire powder']. Again, the compound *àbólōwɔ́* 'bread flour' combines two simple nouns *àbólō* and *ēwɔ́*. Other simple noun compounds are in (6).

(6)	**Base$_1$**	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*dzò*	'fire'	*èwɔ́*	'powder'	*dzòwɔ́*	'ash'
b.	*èblí*	'corn'	*ēwɔ́*	'flour'	*èblíwɔ́*	'corn flour'
c.	*tūgbē*	'beauty'	*èfiā*	'queen'	*tūgbēfiā*	'beauty queen'
d.	*àbólō*	'bread'	*èkpó*	'hill/mound'	*àbólōkpó*	'oven'
e.	*àbólō*	'bread'	*ēwɔ́*	'flour'	*àbólōwɔ́*	'bread flour'
f.	*èzã*	'night'	*èʊú*	'vehicle'	*èzãʊú*	'deceit'

Note that the vocalic prefix that occurs on the bases in isolation (e.g., *è-* as in *èkpó* and *èwɔ́*) does not make it into the compound if the noun is the second constituent and the first constituent terminates in a vowel. For example, *ēwɔ́* in (6b) loses its prefix in the compound *èblíwɔ́* because it is the second constituent, and the preceding constituent is vowel final. Note that, while the loss of the prefix of the second constituent occurs consistently across N-N compound, we find occasional elision of nominal prefixes of even lefthand constituents. Thus, the compound *èblíwɔ́* (6b) may be realised simply as *blíwɔ́*.

Again, a compound noun and a simple noun can combine in N-N compound formation, as shown in (7) where all the lefthand constituents are themselves compounds. For example, *àbólōwɔ́kōtōkú* 'flour sack', *àbólō-wɔ́* 'bread flour' and a simple noun *kotokú* 'sack' forming the compound. The dashes mark the internal boundaries of the constituents.

(7)	**Base$_1$**	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*àgbá-mē*	bowl	*àtádí*	pepper	*àgbámētádí*	raw pepper
b.	*nyā-dzɔ̄dzɔ̄*	news *àgbàlẽ*	paper		*nyādzɔ̄dzɔ̄gbālẽ*	newspaper
c.	*kpè-kpé*	gathering	*àgbàlẽ*	book/paper	*kpèkpégbalẽ*	invitation card
d.	*àbólō-wɔ́*	bread flour	*kotokú*	sack	*àbólōwɔ́kōtōkú*	flour sack
e.	*ŋɔ̄tí-me*	nostril	*dzèsì*	sign	*ŋɔtímedzesi*	tilde

Furthermore, two compounds can combine to form N-N compounds as shown in (8), where the compound *yāmēʊúdzēfé* 'airport' has two compounds as constituents.

(8)	**Base$_1$**	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
	āyā-mē-ʊú	aeroplane	*dzè-fé*	station	*āyāmēʊúdzēfé*	airport

One of the properties of compounds which they share with syntactic constructions is recurrence, the situation where a construction of a certain type is embedded in another construction of the same type. As Spencer (1991: 310) observes, "[c]ompounding resembles syntactic processes in that it is typically recursive." For example, a prepositional phrase headed by *of* (e.g., [*of* the house]$_{PP}$) may be embedded in another prepositional phrase headed by *out* (e.g., [*out* [of the house]$_{PP}$]$_{PP}$). Similarly, a compound may be embedded in another compound of the same type, showing that compounding rules can apply recursively. For nominal

compounds, this property may be responsible for their legendary productivity. As Booij (2002: 142) puts it, [t]he productivity of nominal compounding, in particular of NN compounds, is increased by the fact that constituents can be compounds themselves."

We have shown that two nouns (simple/complex) may be combined to form N-N compounds of varying degrees of internal complexity, although formally quite transparent. Examples (7) and (8) also show that Ewe N-N compounds may be recursive. Building on existing examples in our dataset, we constructed the data in Table 1 to further illustrate recursivity, and there seems to be no limit to the degree of recursivity. However, as observed in the literature, processing might be affected by too much recursivity (cf. Booij 2002: 142).

Table 1. Recursion in Ewe N-N compounds

	Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a	*āyā-mē-ʋú*	aeroplane	*dzè-fé*	station	*āyāmēʋúdzēfé*	airport
b	*āyāmēʋúdzēfé*	airport	*dɔ́wɔ̄láwó*	workers	*āyāmēʋúdzēfé-dɔ́wɔ̄láwó*	airport workers
c	*āyāmēʋúdzēfé-dɔ́wɔ̄láwó*	airport workers	*èʋú*	vehicle	*āyāmēʋúdzēfé-dɔ́wɔ̄láwó-ʋú*	airport workers' bus
d	*āyāmēʋúdzēfé-dɔ́wɔ̄láwó-ʋú*	airport wor -kers' bus	*ʋúkālá*	driver	*āyāmēʋúdzēfé-dɔ́wɔ̄láwó-ʋúkālá*	airport work-ers' bus driver
e	*āyāmēʋúdzēfé-dɔ́wɔ̄láwó-ʋúkālá*	airport workers' bus driver	*mlɔ́-fé*	restroom	*āyāmēʋúdzēfé-dɔ́wɔ̄láwó-ʋúkālá*	airport work-ers' bus driv-ers' restroom
a	*àgbèlìmàkpà*	cassava leaf	*dɔ̀lélé*	disease	*àgbèlìmàkpàdɔ̀lélé*	cassava leaf disease
b	*àgbèlìmàkpàdɔ̀lélé*	cassava leaf disease	*mātsī*	medicine	*àgbèlìmàkpàdɔ̀lélé-mātsī*	cassava leaf disease medicine
c	*àgbèlìmàkpàdɔ̀lélé-mātsī*	cassava leaf disease medicine	*tūkpá*	bottle	*àgbèlìmàkpàdɔ̀lélé-mātsī-tūkpá*	cassava leaf disease medi-cine bottle
a	*àbɔ̀bì*	anchovies	*atádí*	stew	*àbɔ̀bìtádí*	anchovy stew
b	*àbɔ̀bìtádí*	anchovy stew	*àgbá*	bowl	*àbɔ̀bìtádí-gbá*	anchovy stew bowl
c	*àbɔ̀bìtádígbá*	anchovy stew bowl	*tākpūi*	cover	*àbɔ̀bìtádígbá-tākpūi*	anchovy stew bowl cover
d	*àbɔ̀bìtádígbátākpūi*	anchovy stew bowl cover	*ālɔ̄*	handle	*àbɔ̀bìtádígbátākpūi-lɔ̄*	anchovy stew bowl cover handle

4.2 *Internal semantic relation in N-N Compounds*

As widely observed, the constituents of N-N compounds share varied semantic relations, a feature which makes such compounds relatively easy to interpret given appropriate contextual information. There is usually a head constituent that expresses a main idea, and another constituent that stands in some kind of relation to the head (*attributive*, *complementary* etc.). However, there is often no formal marking of the relation which is understood to be un/underspecified, allowing for potentially multiple context-dependent interpretation of such compounds (Downing 1977; Bauer 1979; Jones 1983; Benczes 2005, 2010; Lawer & Appah 2020; Gagné & Spalding 2010, 2015). Therefore, the semantic relation between constituents

of such compounds is usually captured at an abstract level as an unspecified relation ***R*** (e.g., [N_1 ***R*** N_2]) to be spelt out for each instantiating compound (Appah 2013b; Jackendoff 2009a; Booij 2009). In the following, we show the varied semantic relations that obtain between the constituents of Ewe N-N compounds, with the relation *R* manifesting as *ingredient in/for*, *location of*, *part of*, *made from/for*, *type of*, etc.

In (9), the referents of the first constituents are ingredients in the preparation of the referents of the second constituents, and the compounds are all hyponyms of their right-hand constituents. For example, *àzì* 'groundnut/peanut' in (9a) and *àbɔ̀bì* 'anchovies' are ingredients in the preparation of *détsī* 'soup' and *ātádí* 'stew' in the compounds *àzìdétsī* 'groundnut/peanut soup' and *àbɔ̀bìtádí* 'anchovy stew' respectively.

(9) **N_1 an ingredient in N_2**

	Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*àzí*	groundnut	*èdétsī*	soup	*àzìdétsī*	groundnut soup
b.	*àbɔ̀bì*	anchovies	*ātádí*	stew	*àbɔ̀bìtádí*	anchovy stew

The examples in (10) are similar and could be put in the same class as those in (9). What differentiates them is that, for those in (10), the referents of the lefthand constituents are expected to be the only ingredients. Indeed, the presence of any other substance could be construed as rendering the referents of the compounds impure; *àgbèlìmɔ́* 'cassava dough' is expected to contain only *àgbèlì* 'cassava'. Similarly, *ēnémī* 'kernel oil' is expected to contain only *ēné* 'kernel'. The potential of additives in similar products leads marketers to introduce such modifiers as *pure*, *virgin*, etc., as differentiators (e.g., virgin kernel oil).

(10) **N_2 made from N_1**

	Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*àgbèlì*	cassava	*āmɔ́*	dough	*àgbèlìmɔ́*	cassava dough
b.	*ēné*	kernel	*āmī*	oil	*ēnémī*	kernel oil
c.	*blí*	corn	*wɔ́*	flour	*blíwɔ́*	corn flour
d.	*dè*	palm	*àhà*	wine	*dēhā*	palm wine

In the examples in (11) the referents of the righthand constituents are meant to be used for the referents of the lefthand constituents. For example, *ēwɔ́* 'flour' is to be used for something which is named by the first constituent as *àbólō* 'bread'. Also, *èvú* 'vehicle' is meant to traverse some space, named as *tɔ̄dzí* 'sea'.

(11) **N_2 meant/used for N_1**

	Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*àbólō*	bread	*ēwɔ́*	flour	*àbólōwɔ́*	bread flour
b.	*tɔ̄dzí*	sea	*èʋú*	vehicle	*tɔ̄dzíʋú*	ship
c.	*dɔ̀*	sick	*āmi*	oil	*dɔ̀mì*	ointment

All the second constituents in example (12) are holders/receptacles for the referents of the first constituents; *àvà* 'ban' is made for storing/holding *èblí* 'maize'.

(12) **N_2 holder/receptacle for N_1**

	Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*èblí*	maize	*àvà*	barn	*èblíva*	barn (for storing maize)
b.	*àkpā*	fish	*kūsī*	basket	*àkpākūsī*	basket for storing fish
c.	*èɡà*	money	*kòtòkú*	sack	*èɡàkòtòkú*	money bag

For some identified relations – (13)-(17) – we have one example each in our dataset. *Àfī* 'dust/ash' (13) is produced when there is *èdzò* 'fire'. So, *àfī* is the product/result/effect of *èdzò* 'burning fire'. In contract, *èdzò* 'fire' in (14) is fuelled by the referent of *àká* 'charcoal'.

(13) **N_2 is result/product of N_1**

Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
èdzò	fire	*àfī*	dust	*èdzòfī*	ash

(14) **N_2 is fuelled by N_1**

Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
àká	charcoal	*èdzò*	fire	*àkádzō*	charcoal fire

In (15), the second constituent *dzèsì* 'mark' uniquely identifies the referent of *àɖákā* 'box'. Similarly, in (16) the first constituent *àblɔ̀ɖè* 'freedom' identifies the referent of the second constituent *àmē* 'man' by its state.

(15) **N_2 identifies N_1**

Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
àɖákā	box	*dzèsì*	mark	*àɖákādzèsī*	box number

(16) **N_1 names the state of N_2**

Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
àblɔ̀ɖè	freedom	*àmē*	man	*àblɔ̀ɖèmè*	freeman

In (17), the second constituent *àtí* 'wood' names the material for making the referent of the first constituent *àbà* 'bed'.

(17) **N_1 is made from N_2**

Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
àbà	mat/bed	*àtí*	wood	*àbàtí*	bed

The examples in (18) suggest that the referents of the first constituents are where the referent of second constituents are found/located.

(18) **N_1 is location of N_2**

	Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*ègbé*	bush	*àfī*	mouse	*ègbéfī*	bush mouse
b.	*dzògbè*	savanna	*èdé*	palm	*dzògbèdé*	savanna palm
c.	*dè*	home	*kɔ̄nú*	ritual	*dèkɔ̄nú*	culture
d.	*dɔ̀mè*	*stomach*	*dzò*	fire	*dɔ̀mèdzò*	anger

The constituents of the compounds in (19) share meronymic ('part of') relations as the referent of each N_2 is a part of the referent of N_1 (cf. Ameka 1991).

(19) **N_2 is part of N_1**

	Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*àgbèlì*	cassava	*ètsró*	back	*àgbèlìtsró*	cassava peel'
b.	*ègbɔ̃*	goat	*èfú*	hair	*ègbɔ̃fú*	goat hair/faire
c.	*àbɔ̀bɔ́*	snail	*ègò*	shell	*àbɔ̀bɔ́gō*	snail shell
d.	*ètā*	head	*èɖà*	hair	*ètāɖā*	hair

The referents of the first constituents in (20) are typical users of the referents of the second constituents.

(20) **N_2 typically used by N_1**

	Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*nyɔ́nū*	woman	*àvɔ́*	cloth	*nyɔ̀nūvɔ́*	ladies cloth
b.	*èfiā*	king/chief	*èzìkpì*	stool	*èfiāzīkpī*	chief stool

In example (21), the referents of the second constituents are the container for the referents of the first constituent. For example, *tsī* 'water' is usually contained/found in *vúdō* 'dug out' (21b).

(21) **N_2 is container for N_1**

	Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*yāmēvú*	aeroplane	*dzèfé*	station	*yāmēvúdzèfé*	airport
b.	*ētsī*	water	*èvúdó*	dug out	*ētsivúdó*	well
c.	*āmātsī*	medicine	*èzé*	pot	*āmātsīzé*	herb pot
d.	*āmī*	oil	*ègò*	container	*āmīgǒ*	oil container
e.	*àdzàlɛ̃̀*	soap	*àgbǎ*	bowl	*àdzàlegbá*	sponge dish

In (22), the second constituents name dwellings/hiding places for the first constituents of the compounds. For example, *èdò* 'hole' is the dwelling for *àfi* 'mouse'. Likewise, *èkpó* 'pen' is the dwelling for è*gbɔ̃* 'goats'.

(22) **N_2 is dwelling for N_1**

	Base$_1$	**Meaning**	**Base$_2$**	**Meaning**	**Compound**	**Meaning**
a.	*àfi*	mouse	*èdò*	hole	*àfīdō*	mouse hole
b.	*bàbà*	termite	*èkɔ́*	mound/hill	*bàbàkɔ́*	ant hill
c.	*ānyí*	bee	*ētō*	hole	*ānyīto*	beehive
d.	*ègbɔ̃*	goat	*èkpó*	pen	*ègbɔ̃kpó*	goat pen

The examples in (22) are generally similar to those in (21). However, they differ slightly on grounds of the animacy status of the left-hand constituents. That is, the referents of the nouns under N_1 in (22) are animate while those in (21) are inanimate. However, the similarity of the semantic relations between the constituents is unsurprising, given that being entities, both living and non-lining things have actual existence and must be located somewhere.

In this section we have exemplified the semantic relations that exist between the constituents of the Ewe N-N compounds in our dataset. It goes without saying, however, that most of the compounds could fit into multiple interpretational schemas as a matter of construal and perspectivization. For example, we indicated that the relation between the constituents of the compounds *àfīdō* 'mouse hole', *bàbàkɔ́* 'ant hill' and *ānyīto* 'beehive' (22a-c) is "N_2 is dwelling for N_1". However, if we consider the compounds from the perspective of the creation of the referents of the righthand constituents, the relation would be "N_2 is created by N_1", and the compounds will be different from *ègbɔ̃kpó* 'goat pen' (22d) for which the referent of N_1 does not have the capacity to create the referent of N_2. This property of the compounds at issues is consistent with what is attested in the literature (Jones 1983; Downing 1977), and needs to be explored further to ascertain whether the flexibility in the interpretation of Ewe N-N compounds can be compared to what obtains in a language like English (cf. Downing 1977).

4.3 *Headedness in Ewe N-N compounds*

As noted above, the head of a compound determines the core properties of the compound. If a compound has a head constituent, it is said to be endocentric, and it can be dual-headed, with constituents sharing headship qualities equally. Otherwise, it is exocentric. The head may be located on the right or left. It has been suggested that the position of the head is a parameter set for each language so that the morphology of a language is either left-headed or right-headed (Selkirk 1982; Scalise 1988). However, as indicated above, that cannot be sustained because of languages like Nizaa which have an almost equal distribution of left-headed and right-headed compounds (Pepper 2010). What is certain is a crosslinguistic preference for right-headedness, and our dataset reflects that.

4.3.1 *Endocentric N-N compounds*

Our dataset reveals both left-headed and right-headed endocentric N-N compounds with the right-headed ones forming a larger group, consistent with the observed crosslinguistic preference for right-headedness. However, dual-headed compounds are almost non-existent. Right-headed N-N compounds in Ewe are regular, mostly compositional and the commonest subtype. See Table 2.

Table 2. Right-Headed Noun-Noun Compounds

	Base$_1$	**Gloss**	**Base$_2$**	**Gloss**	**Compound**	**Gloss**
1	*àgbèlì*	cassava	*āmākpā*	leaves	*àgbèlìmàkpà*	cassava leaves
2	*èdzò*	fire	*àfĺ*	dust	*èdzòfĺ*	ash
3	*àvùvɔ̀*	cold	*àwù*	dress	*àvùvɔ̀wù*	sweater
4	*ètɔ̄dzí*	river top	*àhà*	drink	*ètɔ̄dzíhā*	schnapps
5	*àdè*	hunt	*àvú*	dog	*àdèvú*	hunting dog
6	*èkpé*	cough	*èdɔ̀*	ailment	*èkpédɔ̄*	cough ailment
7	*àkútsá*	sponge	*àgbá*	bowl	*ákútságbá*	sponge dish
8	*kōkló*	chicken	*àzì*	egg	*kōklózì*	egg
9	*ètɔ̄dzí*	sea	*èvú*	vehicle	*ètɔ̄dzívú*	ship/boat

We explained earlier that the head determines most properties of the compound. This was assumed to be achieved through the mechanism of feature percolation (Lieber 1989), so that the class of elements denoted by the compound is usually a subset of the class of elements that is denoted by the head of the compound. This ensures that the head alone can occur in place of the compound, but the non-head constituents cannot do that. For example, *àvùvɔ̀wù* 'sweater' (Table 2, row 3) is a hyponym of *àwù* 'dress', the head. Therefore, *àwù* can occupy the position in which *àvùvɔ̀wù* is expected to occur, yielding only a slightly less informative construction (23a), but the non-head constituent *àvùvɔ̀* cannot occur alone where *àvùvɔ̀wù* is expected to occur. If it happens, the word will either be ill-formed, or the meaning will be completely different (23b).

(23) a. *àvùvɔ̀wù/àwù* *lè* *àsí* *nyè*
cold dress/dress have hand me
'I have a sweater/dress.'

b. **àvùvɔ̀ lè* *àsí* *nyè*
cold have hand me
'I have a cold.'

For each construct in Table 3 below, the whole is a hyponym of the left-hand constituent, the head. Being a superordinate, the head can occur alone where the compound is expected without a significant meaning loss. Thus, because *àkpā* 'fish' is the head of *àkpāví* (Table 3, row 4), *àkpā* can occur alone in its place, as shown in (24a). If *èví* 'child' occurs in place of *àkpāví* the meaning of the construction, although well-formed, will be totally different. See (24b).

Table 3. Left-Headed Noun-Noun Compounds

	Base$_1$	**Gloss**	**Base$_2$**	**Gloss**	**Compound**	**Gloss**
1	*kōkló*	chicken	*àtsú*	male	*kōklótsú*	rooster
2	*kókló*	chicken	*èví*	offspring	*kóklóví*	chicken
3	*ègbɔ̃*	goat	*èví*	offspring	*ègbɔ̃vi*	kid
4	*àkpa*	fish	*èví*	child	*àkpaví*	fingerlings
5	*nɔ̃ví*	sibling	*nyɔ́nū*	girl	*nɔ̃vínyɔ́nū*	sister
6	*nɔ̃ví*	sibling	*ŋútsu*	male	*nɔvíŋútsu*	brother
7	*àtí*	tree	*àkplɔ̃*	hook	*àtíkplɔ̃*	walking stick

(24) a. *Kofi ɖè àkpāví/àkpā*
Kofi catch fingerlings/fish
'Kofi caught fingerlings/fish'

b. *Kofi ɖè èví*
Kofi catch child/offpring
'Kofi caught the child'

According to Fabb (1998:67), when both constituents are seen as "equally sharing head-like characteristics, as in *student-prince* (both a student and a prince)" then they are coordinate compounds. We can say that coordinate compounds are rare in Ewe. The form *māmágbɔ́ví* (Table *4*, row 1) is said to refer to one who is both a grandmother and a maid, although its actual referent is neither a grandmother nor a maid (see Agbadah 2018; Appah 2019b). For completeness, we analyse this compound as suggested by our sources, but it is difficult to appreciate how it can be treated as a coordinate compound.

Table 4. Dual-Headed Noun-Noun Compounds

	Base$_1$	**Gloss**	**Base$_2$**	**Gloss**	**Compound**	**Gloss**
1	*māmá*	grandmother	*gbɔ́ví*	maid	*māmágbɔ́ví*	one trained by grandmother (a spoilt child)
2	*àbă*	mat	*àtí*	wood	*àbàtí*	bed (lit. wood bed)

Sometimes the whole compound denotes not the sum of the two parts but a compromise between the two, a half-way point between them. Again, sometime whether a compound is treated as coordinate or any other, like subordinate compound, might be a matter of construal because multiple readings might be possible in appropriate context, as shown above. The compound *àbàtí* 'bed' (Table 4, row 2) can be seen as one which is both *aba* 'mat/bed' and *àtí* 'wood' making it a coordinate compound with equally shared head-like characteristics for the constituents. On the other hand, the construction might be read as a type of *àbă* 'bed' (head) which is made from *àtí* 'wood' (non-head), making it a left-headed subordinate compound.

4.3.2 *Exocentric N-N compounds*

As discussed above, exocentric compounds have no head elements and so their meanings tend not to be directly related to those of their constituents. For example, the constituents of *èzàʋú*

(25c) are *èzà*, 'night' and *èvú* 'vehicle', but the meaning of the compound ('deceit') is not directly related to neither *vehicle* nor *night*. Thus, the meaning relation between the meaning of the compound and those of the constituents is metaphorical.

(25)	**Base1**	**Meaning**	**Base2**	**Meaning**	**Compound**	**Meaning**
a.	*ègbè*	bush	*àvú*	dog	*ègbèvú*	ruffian
b.	*èzã̀*	night	*èvú*	vehicle	*èzã̀vú*	deceit
c.	*èzã̀*	night	*ènú*	thing	*èzã̀nú*	bribe

Compared to their endocentric counterpart, exocentric compounds are not very common in Ewe. The three examples in (25) are the only exocentric compounds found in our original dataset (Table 8, 21-23). The paucity of examples casts doubts on the existence of exocentric compounds in Ewe, but it is consistent with the limited productivity of exocentric compounds cross-linguistically. In an earlier typological study, Appah (2019b) found some more data on exocentric compounds in Ewe based on which certain classes of exocentric compounds in Ewe were recognised. The first is metaphorical compounds, the type "which names an entity to which the denotatum of the compound is compared" (Bauer 2008: 65). For instance, in Table 5 (row 1), a wrinkle is simply referred to as *kèsé-(à)kàbà* 'monkey tribal mark', and Appah (2019b: 14) observes that:

> In many African cultures, people are identified by their tribal marks which are made mostly on the forehead or the cheeks of the person. Thus, the wrinkle in the face of a person is referred to by comparing it to that which occurs on the forehead of a monkey, identifying it as a monkey, just as the tribal mark identifies the bearer as a member of the people group that s/he belongs to.

Table 5. Metaphorical compounds in Ewe (Appah 2019b: 14)

	Base$_1$	**Gloss**	**Base$_2$**	**Gloss**	**Compound**	**Gloss**
1	*kèsé*	monkey	*àkàbà*	tribal mark	*kèsé-(à)kàbà*	wrinkle
2	*ŋɔ̀lì*	ghost	*xèxí*	umbrella	*ŋɔ̀lì xèɣí*	mushroom
3	*àŋɔ̀*	paint/bitumen	*tō*	ear	*àŋɔ́tō*	dandelion
4	*èzã̀*	night	*èvú*	vehicle	*èzã̀vú*	deceit
5	*kèsé*	monkey	*kúkú*	hat	*kèsé-kúkú*	mockery

Appah (2019b: 12) also identified compounds whose properties match the description of location bahuvrihi compounds, those that "refer to the place where the denotatum of the compound happens or is located." See Table 6.

Table 6. Location bahuvrihi compounds in Ewe (Appah 2019b: 12)

	Base$_1$	**Gloss**	**Base$_2$**	**Gloss**	**Compound**	**Gloss**
1	*àfɔ̀*	leg	*dzí*	upper surface	*àfɔ̀dzí*	toilet
2	*kpɔ́*	fence/wall	*xā*	behind	*kpɔ́xā*	latrine
3	*kpó*	mound	*dzí*	upper surface	*kpó dzí*	hilltop, location of a school
4	*kɔ́*	mount	*dzí*	top	*kɔ́dzí*	hospital
5	*nú*	thing	*gódō*	behind	*núgódō*	toilet
6	*bè*	thatch	*mè*	inside	*bèmè*	where thatch is fetched
7	*tɔ̀*	river/stream	*mè*	inside	*tɔ̀mè*	place where water is fetched
8	*àhà*	liquor/palmwine	*mè*	inside	*àhàmè*	place where palm wine is made

These constructions are often analysed as noun-postposition (N-P) compounds (Agbadah 2018). However, Appah (2019b) argued that the so-called postpositions are nouns which name locations and surfaces. For example, the form *dzí* which is rendered as 'top' refers to the 'upper surface' of some entity. Similarly, *gódō* which is rendered as 'behind' refers to the 'backside' of some entity. Thus, we may regard the so-called postpositions as locative nouns, naming locations or surfaces, as canvassed for similar items in Akan (cf. Osam et al. 2011). Thus, the so-called N-P compounds may be better analysed as N-N compounds as shown in Table 6.

The basis for regarding the Ewe compounds in Table 6 as exocentric is their apparent contemporary non-transparency/non-compositionality. However, as Appah (2019b) observes, there are hints about the motivation for their initial formation: a native speaker linguist "suggested that *kpódzí*, for example, became the name of the location of a school because it used to be the case that schools were built on hills or elevated grounds. The same understanding underpins *kɔ́dzí* (lit. mount top) which refers to a hospital" (Appah 2019b: 12-13). Thus, as landscape terms, these words are transparent. Their semantic opacity results from their lexicalization as names of institutions.

The Ewe compounds in Table 7 have the same semantic import as N-V compounds in related languages like Akan. However, they are N-N action nominals in which the right-hand constituents are nominalized through reduplication because it is established that Ewe forms nominals through verb reduplication (Ofori 2002; Ameka 1999; Essegbey 2002).

Table 7: Compound Action Nominals in Ewe (Appah 2019b: 17)

	Base$_1$	**Gloss**	**Base$_2$**	**Gloss**	**Compound**	**Gloss**
1	*ènú*	thing	*ɖù*	eat	*ēnú-ɖūɖū*	eating
2	*tí*	jump	*èkpó*	?	*kpó-títí*	jumping
3	*kù*	fetch	*ètsì*	water	*ētsì-kùkú*	testing
4	*dzì*	sing	*èhà*	song	*èhà-dzìdzì*	singing
5	*fò*	beat	*èvù*	drum	*èvù-fófō*	drumming
6	*dó*	plant	*dzì*	heart	*dzì-dódó*	endurance
7	*fò*	cook	*kókó*	porridge	*kókó-fófō*	pleading

This section has discussed the formal and semantic properties of N-N compounds in Ewe, noting that the compounds are formed from both simple and complex nouns, including compounds, thus showing that Ewe compounds may be recursive. The semantic relations between the constituents too have been discussed with various classes posited based on the relations between the constituents. We further grouped and discussed the compounds based on the nature of headedness in the compounds.

5 Conclusion

We have presented a descriptive account of the types and properties of Ewe N-N compounds. We classified them by various criteria, including the presence of a head element (endocentric vs. exocentric compounds), the position of head constituents (left-headed, right-headed, dual headed) and the semantic relations between the constituents. We have shown that Ewe N-N compounds are formed from both simple and complex bases and that the structure of the compounds, though potentially recursive, tend to be transparent. The compounds are largely regular semantically, although the overall meanings of exocentric compounds may not be transparent. We have demonstrated that most endocentric N-N compounds are attributive and right-headed, although there exist left-headed as well as exocentric N-N compounds in the language. We noted that the existence of dual-headed N-N compounds in Ewe is doubtful.

Finally, we showed that the semantic relations that characterise Ewe N-N compounds, include *ingredient of*, *location of*, *part of*, *made for*, *type of*, *part of*, etc.

Table 8. Complete list of Ewe Noun-Noun Compounds

	Base$_1$	**Gloss**	**Base$_2$**	**Gloss**	**Compound**	**Meaning**
1	àbólō	bread	ēwɔ́	flour	àbólōwɔ́	bread flour
2	àbɔ̀bì	anchovies	àtádí	stew	àbɔ̀bìtádí	anchovy stew
3	àbà	mat	àtí	wood	àbàtí	bed
4	yāmēʋú	aeroplane	dzèƒé	station	yāmēʋúdzēƒé	airport
5	àdzɔ̀	contribute	gà	money	àdzɔ̀gà	tax
6	àdzàlɛ̀	soap	àgbă	bowl	àdzàlegbá	sponge dish
7	àɖákā	box	dzèsì	mark	àɖákādzèsī	box number
8	àblɔ̀ɖè	freedom	àmē	man	àblɔ̀ɖèmè	freeman
9	ètɔ̄dzí	sea	èʋú	vehicle	ètɔ̄dzíʋú	ship
10	èblí	corn	ēwɔ́	flour	èblíwɔ́	corn flour
11	èdè	home	kɔ̄nú	ritual	èdèkɔ̄nú	culture
12	èdè	palm	àhà	wine	èdēhā	palm wine
13	èdɔ̀	sick	āmi	oil	èdɔ̀mì	ointment
14	èdɔ̀mè	stomach	èdzò	fire	dɔ̀mèdzò	anger
15	èdzò	fire	ēwɔ́	powder	èdzòwɔ́	ash
16	ètrɔ̃	fetish	èʋú	drum	èɔ̃ʋú	fetish drum
17	ētɔ̄dzí	sea	àhà	wine	ētɔ̄dzíhā	schnapps
18	tūgbē	beauty	èfia	queen	tūgbēfiă	beauty queen
19	kòkô	cocoa	àgblè	farm	kòkôgblè	cocoa farm
20	àtí	wood	àkplɔ̃	arrow	àtíkplɔ̀	walking stick
21	èbgbè	bush	àvú	dog	èbgbèvú	ruffian
22	èzɜ̃̀	night	eúu	vehicle	èzɜ̃̀ʋú	deceit
23	zɜ̃̀	night	ēnú	thing	èzɜ̃nú	bribe
24	kèsé	monkey	kúkú	hat	kèsé-kúkú	mockery
25	kèsé	monkey	àkàbà	tribal mark	kèsé-(à)kàbà	wrinkle
26	ŋɔ̀lì	ghost	xèxí	umbrella	ŋɔ̀lì xèɣí	mushroom
27	àŋɔ̀	paint/bitumen	tó	ear	àŋɔ́tō	dandelion
28	èkú	death	tèƒé	place	èkútèƒé	funeral
29	àfɔ̀	leg	dzí	upper surface	àfɔ̀dzí	toilet
30	èkpɔ́	fence/wall-	xā	behind	èkpɔ́xā	latrine
31	èkpó	mound	dzí	upper surface	èkpó dzí	hilltop/location of a school
32	èkɔ́	mount	dzí	top	èkɔ́dzí	hospital
33	ènú	thing	gódō	behind	ènúgódō	toilet
34	èbè	thatch	mè	inside	èbèmè	where thatch is fetched
35	ètɔ̀	river/stream	mè	inside	ētɔ̀mè	place where water is fetched
36	àhà	liquor/palmwine	mè	inside	àhàmè	place where palm wine is made
37	àgbà	goods	àfɔ̀	leg	àgbàfɔ̀	Lader
38	(è)dě	palm	àtí	tree	(è)dètí	palm tree
39	àgblɔ̄	hook	èvŭ	drum	àgblɔ̄ŭ	drum supported by hooks

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