

Circumfixation in Akan: A Morpheme-Based Analysis of Nominalization and Pluralization

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APA Citation:

Amoh, S. O., Nyarko, I., Amoah, B., & Amoh, S. (2026). Circumfixation in Akan: A morpheme-based analysis of nominalization and pluralization. *Journal of English Language and Linguistics*, 7(2), 366-378.
<https://doi.org/10.62819/jel.2026.2399>

Received: May 19, 2026

Revised: July 27, 2026

Accepted: July 31, 2026

Abstract

This study examines circumfixation in Akan (Kwa), focusing on its role in nominalization and pluralization. While prefixation and suffixation in Akan have received extensive attention (Dolphyne, 2006; Bodomo & Marfo, 2005; Ofori, 2016), circumfixation remains understudied. We argue that Akan has three productive circumfixes: *a-* *-e(e)* for locative nominalization, *n-* *-ɪ(ɛ)* for non-locative nominalization, and *e/a-* *-fo(ɔ)* for pluralization of [+human] nouns. These circumfixes undergo ATR vowel harmony and consonant assimilation, yielding predictable allomorphic variants. Applying Siegel's (1974) Level Ordering Hypothesis, we demonstrate that the suffixal component (Class 2, category-maintaining) attaches before the prefixal component (Class 1, category-changing). This analysis provides new evidence for the reality of circumfixation in Kwa languages and contributes to the typology of discontinuous morphology.

Keywords: Akan, ATR harmony, circumfixation, nominalization, pluralization

Introduction

Circumfixation—the attachment of a discontinuous affix at both edges of a base—is a widely attested word-formation process (Nida, 1949; Scalise, 1984; Spencer, 1991). However, despite extensive research on prefixation and suffixation in Akan (Dolphyne, 2006; Bodomo & Marfo, 2005; Adomako, 2012; Ofori, 2016), circumfixation has received comparatively little attention. This gap is significant because circumfixation challenges traditional binary classifications of affixation and raises important theoretical questions about the nature of discontinuous morphemes.

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1. The Akan Language

Akan refers to both an ethnic group and a linguistic group in Ghana and parts of Ivory Coast. In Ghana, geographically, this group of people predominantly occupy the southern (including the Oti enclave carved out of the Volta Region) and middle part of Ghana. The Akan with its various subdivisions has an identical culture and a language with intricate relationships leading to mutual intelligibility. According to Agyekum (2004), the Akan language consists of about ten related dialects that include Asante, Akuapem, Fante, Agona, Assin, Ahanta, Akyem, Wassa, Bono, etc. From the lists of dialects, it is only the three major dialects; Asante, Akuapem, and Fante that have achieved literary status. Geographically, nine out of the sixteen regions in Ghana are predominantly occupied by the Akans and they speak any of the dialects as their mother tongue. These regions are Central, Eastern, Ashanti, Western, Western North, Bono East, Bono, Oti, and the Ahafo regions. However, due to migration, Akan speakers can be found across the length and breadth of the country. According to the Ghana Statistical Service (2021), over 50% of Ghana's population either speak or understand the three major dialects as an L1 or a lingua franca. Due to its dominance and wider coverage, it is not out of place to claim that Akan is the most widely spoken language in Ghana.

This paper addresses two central questions:

1. What are the domains and formal properties of circumfixation in Akan? We identify three productive circumfixes and their allomorphic variants, showing that circumfixation operates in both derivational morphology (nominalization) and inflectional morphology (pluralization).
2. What does Akan circumfixation reveal about affixation order and the nature of discontinuous morphemes? Applying Siegel's (1974) Level Ordering Hypothesis, we demonstrate that circumfixes in Akan follow a principled order: category-maintaining suffixes attach before category-changing prefixes.

Following Nida (1949) and Mbah (2012), we define circumfixation as a process where a discontinuous affix consisting of two parts attaches around a free morpheme. The two parts collectively convey a consistent meaning or grammatical function. Crucially, neither component can independently produce the intended meaning or category change (Fromkin, 2003; Spencer, 1991). Consider the Akan example in (1):

1.

a-bɔ-ɪ(ɛ) 'end point' [Asante/Akuapem]

Morpheme	Function	
Prefix:	a-	Nominal prefix (Class 1)
Base:	bɔ	Verb 'join'
Suffix:	-ɪ(ɛ)	Nominal suffix (Class 2)

Crucially, neither component alone can express the locative nominal meaning:

a-bɔ → perfect aspect verb ('has joined'), not a noun

bɔ-ɪ(ɛ) → ungrammatical as a locative noun

This interdependence is the hallmark of circumfixation and distinguishes it from the co-occurrence of independent prefix and suffix.

2. *Scope and Methodology*

This study focuses on three domains of circumfixation in Akan:

1. Locative nominalization
2. Non-locative nominalization
3. Pluralization of [+human] nouns

We also briefly discuss adjectivization, though this is a secondary function of deverbalized nominals rather than a distinct circumfixation domain.

Methodologically, we adopt a morpheme-based approach (Selkirk, 1982; Lieber, 1983) and identify circumfixes using three criteria (Hockett, 1947; Harris, 1951; Lightner, 1975):

- i. **Contrast:** Comparing forms with and without the circumfix reveals its function
- ii. **Recurrence:** Circumfixes appear across multiple word forms
- iii. **Stable meaning:** Circumfixes have consistent grammatical or semantic functions

Data are drawn from the three major Akan dialects: Asante, Akuapem, and Fante. Dialectal variation is marked throughout: (As) for Asante, (Ak) for Akuapem, and (Fa) for Fante.

1.3 *Organization*

The paper is organized as follows. Section 2 reviews the literature on circumfixation cross-linguistically and evaluates theoretical objections. Section 3 outlines the theoretical framework, combining morpheme-based morphology with Siegel's (1974) Level Ordering Hypothesis. Section 4 examines the phonological behaviour of circumfixes, including ATR vowel harmony and consonant assimilation. Section 5 presents the three empirical domains of circumfixation. Section 6 tests the affixation order against the Level Ordering Hypothesis. Section 7 concludes and identifies directions for future research.

Circumfixation in Retrospect

Circumfixation involves the attachment of a discontinuous affix consisting of two parts around a free morpheme (Nida, 1949; Mbah, 2012). The two parts may have different phonological shapes, but they collectively convey a consistent meaning or grammatical function (Spencer, 1991; Fromkin, 2003). Various terms have been used for this phenomenon—including *ambifix*, *confix*, and *circumflexion*—but *circumfix* and *circumfixation* are the most widely accepted in contemporary morphological literature (Anagbogu, 1990; Spencer, 1991; Fromkin, 2003; Ihezuonu, 2011). In this paper, we adopt these terms without endorsing theoretical distinctions that lack empirical support.

1. *Cross-Linguistic Evidence for Circumfixation*

Circumfixation is attested in diverse language families for various grammatical functions. Chickasaw (Muskogean; Fromkin, 2003): The circumfix *ik-* *-o* marks negation:

1.

- a. chokma 'He is good' → ik-chokm-o 'He is not good'
- b. tiwwi 'He opens' → ik-tiww-o 'He does not open'

Dutch (Germanic; Ihezuonu, 2011): The circumfix *ge-* *-te* marks plurality:

2.

- a. berg 'mountain' → ge-berg-te 'mountains'
- b. vogel 'bird' → ge-vogel-te 'poultry'

Malay (Austronesian; Spencer, 1991): Circumfixation is pervasive in derivational morphology:

3.

- a. adil 'fair' → ke-adil-an 'fairness' (abstract noun)
- b. panjang 'long' → per-panjan-kan 'to extend' (causative verb)

Japanese (Japonic; Boeckx & Niinuma, 2004): Circumfixes mark expressions of politeness:

4.

- a. yomi 'read' → o-yomi-suru 'humble reading'

These examples demonstrate that circumfixation is a genuine linguistic phenomenon, not an artifact of analysis. The question is not whether circumfixes exist, but how they should be analysed theoretically.

2. Gaps in the Literature

Despite the cross-linguistic evidence, circumfixation in Akan has received little attention. Studies of Akan morphology have focused overwhelmingly on prefixation and suffixation (Dolphyne, 2006; Bodomo & Marfo, 2005; Adomako, 2012; Ofori, 2016). When circumfixation is mentioned, it is often treated as a marginal phenomenon or subsumed under other processes (Osam, 1993; Appah, 2004, 2005). This paper fills this gap by providing a systematic analysis of circumfixation in Akan, identifying its domains, formal properties, and theoretical implications.

Conceptual Framework

This study adopts a morpheme-based approach to morphological analysis (Bloomfield, 1933; Harris, 1951; Selkirk, 1982; Lieber, 1983). In this framework, complex words are composed of morphemes—the smallest units of meaning or grammatical function. The meaning of a complex word is derived compositionally from its constituent morphemes.

This approach is appropriate for analyzing circumfixation because circumfixes, like other affixes, are meaningful units that combine with bases to create new word forms. The discontinuous nature of circumfixes does not undermine their status as morphemes; rather, it challenges simplistic notions of morphological concatenation.

Following Embick and Noyer (2001), we assume that circumfixes are stored as single lexical entries whose discontinuous parts are realized via morphological merger at the two edges of

the base. This allows circumfixes to function as unified morphemes despite their discontinuous surface realization.

1. Morpheme Identification Criteria

To identify circumfixes in Akan, we apply three criteria established in structuralist linguistics (Hockett, 1947; Harris, 1951; Lightner, 1975; Stageberg, 1981):

i. Contrast:

Comparing forms that differ in phonological shape reveals the presence of distinct morphemes. For example, in (6), the difference between the forms in Column A and Column B corresponds to the presence of the circumfix *a-* *-e(ε)*:

5.

	A	Gloss	B	Gloss
a.	<i>tena</i>	‘to sit’	<i>a-tena-e(ε[†])</i>	‘a sitting place.’
b.	<i>soε</i>	‘to offload’	<i>a-soε-e(ε)</i>	‘a place to offload.’
c.	<i>da</i>	‘to sleep’	<i>a-da-e(ε)</i>	‘sleeping place.’

ii. Recurrence:

Morphemes appear as recurring partials across multiple word forms. The circumfix *n-* *-e(ε)* appears in numerous nominalizations:

6.

	A	Gloss	B	Gloss
a.	<i>su</i>	‘to weep’	<i>n-su-i(ε)</i>	‘weeping’
b.	<i>sesa</i>	‘to change’	<i>n-sesa-e(ε)</i>	‘changes’
c.	<i>kan</i>	‘to count’	<i>n-kan-ee</i>	‘numbering’
d.	<i>san</i>	‘to descend’	<i>n-san-ee(ε)</i>	‘declension’

iii. Stable Meaning:

A morpheme must have a consistent meaning or function across its occurrences. The circumfixes in (6)–(7) consistently mark nominalization, and the nominalizing function is stable across all occurrences.

Applying these criteria, we identify the following circumfixes in Akan:

	Circumfix	Function	Example
a.	<i>a-</i> <i>-i(ε)</i>	Locative nominalization	<i>a-bɔ-i(ε)</i> ‘end point’
b.	<i>n-</i> <i>-ii(ε)</i>	Non-locative nominalization	<i>n-susuw-ii</i> ‘suggestion’
c.	<i>a-</i> <i>-fo(ɔ)</i>	Pluralization (human nouns)	<i>a-sika-fo(ɔ)</i> ‘rich people’

2. Level Ordering Hypothesis

To analyze affixation order, we adopt Siegel’s (1974) Level Ordering Hypothesis, which distinguishes two classes of affixes:

- **Class 1 affixes:** Category-changing; may induce phonological changes
- **Class 2 affixes:** Category-maintaining; attach after Class 1

[†] *ε*-variant is Asante (a dialect of Twi)

Siegel argues that in English, Class 2 affixes attach before Class 1 affixes. This is supported by examples like *measure-able-ity*, where *-able* (Class 2) *precedes* *-ity* (Class 1), as **measure-ity* is ungrammatical. we test whether this ordering applies to Akan circumfixation in Section 6.

The relevance of the Level Ordering Hypothesis to circumfixation is that it provides a principled account of the sequence in which the two components of a circumfix attach to the base. This allows us to move beyond mere description to explanation, showing that circumfixation in Akan follows general principles of affixation order.

3. How this Framework differs from alternatives

The morpheme-based approach adopted here contrasts with lexeme-based morphology (Aronoff, 1976, 1994; Anderson, 1992), where the word itself is the minimum unit of morphological analysis. We adopt the morpheme-based approach because it provides the most straightforward account of circumfixation: circumfixes are discontinuous morphemes that combine with bases to create new word forms. The recurrence of formatives like *n- -i(ε)* across multiple nominalizations supports this analysis, as a lexeme-based approach would need to treat each nominalized form as a separate lexeme with no shared morphological structure.

Phonology of Circumfixation in Akan

Akan affixation is subject to Advanced Tongue Root (ATR) vowel harmony (Dolphyne, 2006; Bodomo & Marfo, 2005). Both prefixation and suffixation observe ATR harmony, where the specification of the base vowel determines the specification of the affix vowel(s). The Akan vowel inventory is divided into [+ATR] and [-ATR] sets:

[+ATR]: [i, e, u, o, æ]

[-ATR]: [ɪ, ɛ, ʊ, ɔ, a]

ATR harmony requires that vowels within a word agree in their ATR specification. When an affix attaches to a base, its vowel(s) assimilate to the ATR specification of the base.

1. ATR Harmony in Circumfixation

Circumfixation follows the same ATR harmony rules. The default circumfixes are [-ATR]: *a- -i(ε)* and *n- -ɪ(ε)*. These undergo assimilation to [+ATR] *e- -i(ε)* and *n- -ii(ε)* when the base contains [+ATR] vowels.

7. ATR harmony in locative nominalization

	Base	Gloss	Trigger	Output	Gloss
a.	bɔ	‘to join’	[ɔ] [-ATR]	a-bɔ-i(ε)	‘joining /endpoint’
b.	da	‘to sleep’	[a] [-ATR]	a-da-i(ε)	‘sleeping place’
c.	sie	‘to hide’	[i, e] [+ATR]	e/a-sie-i(ε)	‘cemetery/ hiding place’
d.	wie	‘to end’	[i, e] [+ATR]	e/a-wie-i(ε)	‘end point’
e.	kum	‘to kill’	[u] [+ATR]	e-kum-ii	‘slaughterhouse’ (Fa)

In (8a-b), the base contains [-ATR] vowels, and the circumfix surfaces as [-ATR] *a- -i*. In (8c-e), the base contains [+ATR] vowels, and the circumfix surfaces as [+ATR] *e- -i* (or *-ii* in Fante).

2. Consonant Assimilation

Consonant harmony also occurs in circumfixation. The prefixal component $\{n-\}$ assimilates to labial $\{m-\}$ before labial consonants, and to velar $\{\eta-\}$ before velar consonants:

8. Labial and velar assimilation

	Base	Gloss	Trigger	Output	Gloss
a.	potɔw	‘to mash’	[p]	m-potɔw- ɪ(ɛ)	‘mashed’
b.	bobɔw	‘to roll’	[b]	m-bobɔw- ɪ(ɛ)	‘rolled’
c.	futuɔw	‘to mix’	[f]	m-futuɔw-ii(ɛ)	‘mixed’
d.	ker	‘to weigh’	[k]	η- ker-ii(ɛ)	‘weighed’
e.	kan	‘to count’	[k]	η- kan-ii(ɛ)	‘counted’

3. Allomorphic Variants

These phonological alternations produce allomorphic variants of the same circumfix. The default $n-$ $-ɪ$ has the following allomorphs:

	Allomorph	Environment
i.	$n-$ $-ɪ$	Default; before non-labial consonants with $[-ATR]$ vowels
ii.	$m-$ $-ɪ$	Before labial consonants with $[-ATR]$ vowels
iii.	$n-$ $-ii$	Before $[+ATR]$ vowels (non-labial)
iv.	$m-$ $-ii$	Before labial $[+ATR]$ consonants

4. Theoretical Implications

The phonological behaviour of Akan circumfixes provides evidence for their status as unified morphemes. The fact that both components of the circumfix undergo ATR harmony simultaneously—assimilating to the same base vowel—suggests that they are governed by a single phonological process. If the prefix and suffix were independent, we might expect them to harmonize independently, possibly with different outcomes. The parallel assimilation of both components supports the circumfixal analysis.

Domains of Circumfixation in Akan

This section presents three domains where circumfixation is productive in Akan: locative nominalization, non-locative nominalization, and pluralization. We also briefly discuss adjectivization, which is a secondary function of deverbalized nominals.

1. Locative Nominalization

In Akan, locative nouns are derived from verbs by circumfixation. The prototypical circumfix is $a-$ $-ɪ(ɛ)$, which attaches to the verbal base to denote the location associated with the action.

9. Locative nominalization

	Base	Gloss	Circumfixed Form	Gloss
a.	bɔ	‘to crack’	a-bɔ-ɛ(ɛ)	‘cracking point’
b.	tsina	‘to sit’	a-tsena-ɪ(ɛ)	‘sitting place’
c.	da	‘to sleep’	a-da-ɛ(ɛ)	‘sleeping place’
d.	pue	‘set off’	e-pue-ɪ(ɛ)	‘set off point’

The interdependence of the two components is demonstrated by the ungrammaticality of forms where one component is omitted:

10.

- a. a-tsena → perfect aspect verb ('has sat'), not a noun
- b. tsena-e → ungrammatical as a locative noun
- c. a-tsena-e(ε) → 'sitting place' (correct)

This interdependence confirms the circumfixal status of these formatives.

2. Non-Locative (Open) Nominalization

Circumfixation also derives non-locative (open) nouns from verbs. The prototypical circumfix is *n-* *-ii(ε)*, with allomorphic variants conditioned by phonology (as described in Section 4).

11. Non-locative nominalization

Base	Gloss	Circumfixation	Gloss
a. toto	'to arrange'	n-toto-e(ε)	'arrangement'
b. hyehye	'to place'	n-hyehye-e(ε)	'placement'
c. susuw	'to suggest'	n-susuw-ii(ε)	'suggestion'
d. sakra	'to alter'	n-sakra-e(ε)	'alteration'
e. kan	'to count'	n-kan-ee(ε)	'numbering'
f. fow	'to rise'	m-fow-ee(ε)	'ascension'

As with locative nominalization, neither component alone can produce the nominal form:

12.

- a. n-toto → negated verb, not a noun
- b. toto-e → remains within verbal domain
- c. n-toto-e(ε) → 'arrangement' (correct)

3. Pluralization of [+Human] Nouns

In Akan inflectional morphology, plurality is typically marked by prefixation {a-, m-, n-, e-} or suffixation {-nom, -fo(ɔ)}. However, certain [+human] compound nominals require both a prefix and a suffix to express plurality (Dolphyne, 2006; Bodomo & Marfo, 2002; Ofori, 2016).

13. Pluralization through circumfixation

Singular	Gloss	Plural	Gloss
a. o-sika-nyi/ni	'rich person'	e/a-sika-fo(ɔ)	'rich people'
b. ɔ-farnyi/ ni	'fisherman'	a-far-fo(ɔ)	'fishermen'
c. ɔ-kwadwe-nyi/ni	'lazy person'	a-kwadwe-fo(ɔ)	'lazy people'
d. o-wud(z)inyi/ni	'criminal'	e/a-wudzi-fo(ɔ)	'criminals'
e. banyin/ni	'boy'	m-banyim-fo	'boys' (Fa)

The singular form in (14) uses the suffix {-nyi} or {-ni} to mark agentivity. The plural form replaces this with the circumfix *e/a-* *-fo(ɔ)* (or *m-* *-fo* in Fante). Neither component alone can express plurality:

14.

- a. e-sika → ‘riches’ (not ‘rich people’)
- b. sika-fo(ɔ) → ungrammatical (lacks plural prefix)
- c. e-sika-fo(ɔ) → ‘rich people’ (correct plural)

This interdependence confirms the circumfixal status of the plural formative. It is worth noting that the prefixal component (e/a-) can express plurality independently in other contexts (e.g., a-dan ‘houses’), and the suffixal component {-fo(ɔ)} can express plurality independently in other contexts (e.g., Ghana-fo(ɔ) ‘Ghanaians’). However, in the specific context of [+human] compound nominals derived from agentive {-nyi} forms, both components are required. This is a case of morphological conditioning: the plural meaning is only fully expressed when both components are present.

4. *Adjectivization (Secondary Function)*

Deverbalized nominals can function as attributive adjectives in Akan nominal phrases. Akan has few categorical adjectives; nouns often serve adjectival functions (Christaller, 1875; Osam, 1994; Appah, 2013).

15. **Adjectivization through circumfixation**

Input Phrase	Gloss	Derived Adj.	Gloss
a. dɔkon potɔw	‘kenkey mash’	dɔkon m-potɔw-ee	‘mashed kenkey’
b. nam toto	‘fish fry’	nam n-toto-e	‘grilled meat’
c. tam pam	‘cloth sew’	tam m-pam-ee	‘sowed dress’
d. kookoo ker	‘cocoa weigh’	kookoo n-ker-ii	‘weighed cocoa’

The verb in the input phrase undergoes circumfixation to become an attributive adjective. These forms can also function as nominals in other contexts, demonstrating their deverbal noun status. We treat adjectivization as a secondary function because it results from the same circumfixation process that derives nominals; the adjectival use is a syntactic function of the derived nominal, not a distinct morphological process.

Affixation Order and the Level Ordering Hypothesis

1. *Applying Siegel’s Hypothesis to Akan*

This section tests whether Akan circumfixation follows Siegel’s (1974) Level Ordering Hypothesis. We propose that the suffixal component of the circumfix is a Class 2 affix (category-maintaining), while the prefixal component is a Class 1 affix (category-changing). If Siegel’s hypothesis holds for Akan, Class 2 affixes should attach before Class 1 affixes.

2. *Classification Criteria*

The classification of affixes into Class 1 and Class 2 is based on the following criteria:

Class 1 (Category-changing):

- i. Changes the syntactic category of the base
- ii. Obligatory for the target word class (in Akan, nominal prefixes are often obligatory)

- iii. May induce phonological changes (e.g., tonal changes)
- iv. In Akan, carries a low tone (Abakah, 2000)

Class 2 (Category-maintaining):

- i. Maintains the syntactic category of the base
- ii. May have independent grammatical functions (e.g., marking aspect)
- iii. Attaches before Class 1 in the derivational sequence

In Akan circumfixation, the prefixal components {a-, n-, e-, m-} are Class 1 because they change the category from verb to noun. The suffixal components {-ɪ(ɛ), -ɪɪ(ɛ), -e(ɛ), -ee(ɛ), -ii} are Class 2 because they maintain the verbal category and correspond to past aspect markers.

3. Affixation Order in Simple Bases

Consider the nominalization of the verb *bɔ* ‘to crack’:

16.

a-bɔ-ɪ(ɛ) ‘cracking point’

The derivation proceeds as follows:

Step 1: The Class 2 suffix -ɪ(ɛ) attaches to the verbal base *bɔ*, yielding *bɔ-ɪ(ɛ)*. This remains within the verbal domain (past aspect).

Step 2: The Class 1 prefix a- attaches to the output, yielding *a-bɔ-ɪ(ɛ)*. This changes the category from verb to noun. Evidence for this order:

17.

- a. *a-bɔ → ungrammatical as a noun (would be past aspect verb)
- b. *bɔ-ɪ(ɛ) → ungrammatical as a noun (remains verbal)
- c. *bɔ-a-ɪ → ill-formed (wrong order)
- d. a-bɔ-ɪ(ɛ) → ‘end point’ (correct)

This ordering is consistent with Siegel’s hypothesis: the category-maintaining suffix attaches before the category-changing prefix.

4. Affixation Order in Reduplicated Bases

Reduplicated bases require an additional affixation step. Consider the derivation of *n-sen-san-ee(ɛ)* ‘lines’:

18.

n-sen-san-ee(ɛ) ‘lines’

Step 1: The reduplicant *sen-* attaches to the base *-san* → *sen-san* (reduplicated verb)

Step 2: The suffix *-ee(ɛ)* (Class 2) attaches → *sen-san-ee(ɛ)* (verbal aspect)

Step 3: The prefix *n-* (Class 1) attaches → *n-sen-san-ee(ɛ)* (noun)

As with simple bases, the category-maintaining affixes (reduplicant and suffix) attach before the category-changing prefix. This is consistent with the broader pattern.

5. Summary of Affixation Order

The following table summarizes the affixation order in Akan circumfixation:

Step	Affix	Class	Function
1	Reduplicant (if present)	Class 2/3	Category maintaining
2	Suffixal component (e.g., -ee(ε))	Class 2	Category maintaining
3	Prefixal component (e.g., (n-))	Class 1	Category changing

This ordering is consistent with Siegel’s Level Ordering Hypothesis and confirms that the prefixal component is dominant (category-changing), while the suffixal component is recessive (category-maintaining). The term “dominant” here refers to the component responsible for the category change; the “recessive” component maintains the base category.

Conclusion

This paper has provided a systematic analysis of circumfixation in Akan, demonstrating that it is a productive process in both derivational and inflectional morphology. The main empirical findings are threefold:

1. **Three productive circumfixes:** Akan has three circumfixes with distinct functions: *a-* *ɪ(ε)* for locative nominalization, *n-* *-ɪ(ε)* for non-locative nominalization, and *e/a-* *-fo(ɔ)* for pluralization of [+human] nouns.
2. **Phonological conditioning:** Circumfixes undergo ATR vowel harmony and consonant assimilation, yielding predictable allomorphic variants. This supports the analysis of circumfixes as unified morphemes, as both components harmonize in parallel.
3. **Principled affixation order:** Following Siegel’s (1974) Level Ordering Hypothesis, the suffixal component (Class 2, category-maintaining) attaches before the prefixal component (Class 1, category-changing). This establishes the prefixal component as dominant in determining the syntactic category of the output.

1. Theoretical Contributions

This study makes three theoretical contributions:

1. **Evidence for discontinuous morphemes:** The interdependence of the two components of each circumfix—neither can independently produce the intended meaning or category change—provides strong evidence for treating circumfixes as single morphemes rather than as co-occurring prefix and suffix.
2. **Extension of the Level Ordering Hypothesis:** This study extends Siegel’s (1974) Level Ordering Hypothesis beyond English suffixation to a Kwa language and to circumfixation. The finding that the same ordering principles apply cross-linguistically supports the universality of the hypothesis.
3. **Typological contribution:** This study adds to the typology of discontinuous morphology

by providing detailed data from a Kwa language, a family where circumfixation has been understudied.

2. Limitations and Future Directions

This study has three main limitations:

1. **Dialectal coverage:** While we have included data from Asante, Akuapem, and Fante, the analysis is not equally thorough across all dialects. Future research should investigate other Akan dialects (e.g., Bono, Wassa) to determine the full range of circumfixal variation.
2. **Quantitative analysis:** This study is qualitative, focusing on identifying and describing circumfixes. A quantitative study of circumfix productivity would complement this analysis by measuring the productivity of each circumfix and identifying factors that constrain its use.
3. **Relationship to other processes:** The relationship between circumfixation and other morphological processes (e.g., compounding, reduplication) deserves further investigation. In particular, the role of reduplication in circumfixation raises questions about the interaction between different word-formation processes.

3. Final Remarks

Despite these limitations, this study has demonstrated that circumfixation is a genuine and productive morphological process in Akan. The findings challenge simplistic views of affixation as strictly linear and provide new evidence for the reality of discontinuous morphemes. The analysis within the Level Ordering Hypothesis shows that Akan circumfixation follows general principles of affixation order, contributing to our understanding of morphological structure and the phonology-morphology interface.

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