

A MORPHOPHONOLOGICAL ANALYSIS OF ONOMATOPOEIC IDEOPHONES IN AKAN (TWI)

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Abstract: The paper seeks to establish the principles and processes – particularly, the phonetic, phonological, morphophonological, grammatical, and metaphorical principles and processes – that are involved in the formation and interpretation of onomatopoeic ideophones in Akan (Twi).

1. Introduction

This paper focuses on ideophones as “vivid vocal images or representations of ... auditory ... experiences” (Cole 1955: 370) in Akan.^{1,2} On syntactic and semantic grounds, onomatopoeic ideophones in Akan can be described as sound emission from an event/state entity adverbialized – that is, when a sound from an event/state entity becomes indicative of the nature and/or extent of the event/state concerned. The nature and/or extent of sound emission, and consequently the morphophonological structure of the ideophonic word, are largely a function of the inherent physical characteristics of the sound emitting entity, and the nature and impact of the relationship that produced the sound concerned. This is an area of Akan morphophonology where signifier-signified association is largely nonarbitrary (Beck 2008; Nuckolls 1999) and often triumphs over phonotactic wellformedness – especially when loyalty to the latter will obliterate an ideophonic word’s capturing of key sound components or effects without which meaning will be either indeterminate or completely destroyed. The fact that the word-object/sound association is highly nonarbitrary (or iconic) (Beck 2008: 6) is one of the main reasons (i.e. aside from the need for a high level of culture- and language-specific knowledge of sound and sound-symbolism) why as spontaneous (or unconventional) as most of the language’s ideophones are, native speakers are still able to, either fully or partially, trace the events/states and entities that produce(d) these onomatopoeic ideophones even out of context and understand them. This is a morphophonological study of onomatopoeic ideophones in Akan. It has been observed in other languages that ideophones are formally different than non-ideophonic word forms (Alpher, 1994; Ameka, 2001; Beck, 2008; Bodomo, 2006; Childs, 1994; Ekere, 1987, Moshi, 1993, Newman, 2000, and Voeltz & Kilian-Hatz, 2001). The central question, therefore, is what speech sounds and phonotactic principles are core to the formation of ideophonic words, and for that reason set them apart from all other word forms of the language? Ideophones in Akan are largely reduplicative. A second question, then, is how are reduplicated ideophones morphophonologically similar or dissimilar to other reduplicative cases (or categories) in the language? Again, as indicated

¹ It has also been defined as “A vivid representation of an idea in sound...” (Doke, 1935: 118).

² Akan is New Kwa and Niger-Congo (Williamson & Blench, 2000); it has two major dialects, the Twi dialects consisting of Akuapem, Akyem, Asante, etc., and Fante.

earlier, ideophonic words are largely spontaneous and often non-conventional, and yet, not semantically indeterminate. The third question to be addressed is how are native speakers of Akan (Twi) able to either fully, or partially, decode the sound emitting entity, and for that matter, the (intended) meaning of an onomatopoeic ideophone that is devoid of conventionality and context, for example? In general, what does the structural knowledge, based on which Akan ideophones are created on the spur of the moment (and understood), look like? In other words, what are the structural mechanics of ideophonic words' creation and comprehension in Akan? Section four (4) is the conclusion.

2. The phonology of onomatopoeic ideophones

This section establishes the phonological structure of onomatopoeic ideophones and addresses the questions: what sounds (i.e. vowels and consonants) are involved in ideophonic word creation; how are they organized both paradigmatically and syntagmatically at this level of Akan phonology; and in terms of their inventory and organization, how are they different from, or similar to, sound inventory and patterns of regular Akan words? Structurally, onomatopoeic ideophones in Akan range between one syllable to eight syllables (e.g. *wá* 'sound of something breaking', and *tɛu.ro.do.do.do.do.do* 'water dripping'), however, two and four syllables are preferred, and the majority of them have four syllables.

2.1 Vowels and vowel distribution in onomatopoeic ideophones

Below in (1) is the oral vowel inventory of Akan (Twi) (based on Dolphyne, 1988). Interestingly, all oral vowel phones in prosaic Akan – surprisingly, including [æ], an allophone of the central low unadvanced in the Twi (i.e. Akuapem, Asante and Akyem, etc.) dialects of Akan – feature in onomatopoeic words.

(1)

Features	i	u	ɪ	ʊ	e	o	ɛ	ɔ	a	æ
High	+	+	+	+	-	-	-	-	-	-
Low	-	-	-	-	-	-	-	-	+	+
Labial/Round/Back	-	+	-	+	-	+	-	+	-	-
ATR	+	+	-	-	+	+	-	-	-	+

2.1.1 Word initial, medial, and final distribution of vowels

Table (2) illustrates the distribution of these oral vowel phones in onomatopoeic words – the three positions are word initial, medial, and final.

(2)

Sound	Word Initial	Word Medial	Word Final
[i]	N/A	<i>pitipata</i> 'sound of someone pounding fufu' (Christaller, 1933)	<i>pibipibi</i> 'torrential rainfall' (Christaller, 1933)

[u]	N/A	<i>putu(putu)</i> ‘the sound of drumming repeatedly’ (Christaller, 1933)	<i>pupupupu</i> ‘a noise in one’s belly’ (Christaller, 1933)
[ɪ]	N/A	<i>pɪpɪ</i> ‘sound of a car horn’	<i>pɪpɪ</i> ‘sound of a car horn’
[ʊ]	N/A	<i>pɔpɔpɔpa</i> ‘expressive of a fist fight’ or ‘of clapping of hands’	<i>pɔ̃ɔ̃</i> ‘sound of a car horn’
[e]	N/A	<i>peŋ</i> ‘expressive of breaking of a stick barehanded’	<i>kiŋkre(ŋ)kiŋkre(ŋ)</i> ‘drumming’ or <i>pee</i> ‘a gunshot’
[o]	<i>òwóò</i> ‘yawning’	<i>koŋ(koŋ)(koŋ)</i> ‘sound of a metallic tube’	<i>teuo</i> ‘applying break’
[ɛ]	N/A	<i>tem</i> ‘sound of something, e.g. a soft fruit, falling to the ground (and breaks as a result)’	<i>bɛɛbɛɛ ~ mɛɛmɛɛ</i> ‘sheep/goat bleating’
[ɔ]	N/A	<i>bɔm</i> ‘the sound of someone falling down – usually with one’s buttocks being the first body part to touch the ground’	<i>kɔkɔkɔ</i> ‘the sound of knocking’
[a]	N/A	<i>babababa</i> ‘sound of running (usually barefooted)’	<i>waa</i> ‘the rushing sound of trees agitated by the wind’
[æ]	N/A	<i>saw(u)</i> [sæw] ‘the casting of net into the sea (to catch fish)’	N/A

None of the ten vowels, with the exception of [o] in the expression, *òwóò* ‘the sound of yawning’ (Christaller, 1933), occurs at word initial position. Only high vowels cannot occur at word initial position in prosaic Akan (Twi) – the expansion of the list, therefore, to include almost all mid vowels and even the low vowel (a more regular vowel sound in this slot of the Akan word) is quite surprising, and is one of the unique structural characteristics of onomatopoeic ideophones in Akan (Twi). Even in prosaic Akan (Twi), the only instance [o] begins a word is when there is, either, underlyingly, or superficially, a [+ATR] vowel after [o]. So this phonotactic condition is in violation here, unless there is credible evidence (which right now is not available) that [w] in *òwóò* derives from /u/. Again, long vowels are not allowed word-initially, unless the second of the two vowels is derived through compensatory lengthening in Akan phonetics and is an allomorph.³ Each and every vowel can appear at onomatopoeic word medial position; and the same is true for every vowel sound at word final position with the exception of [æ], the advanced counterpart of /a/.

³ A case in point is *ɔ-re-wu* ‘S/he is dying’ becoming [o-o-wu] – that is, {re-}, the progressive marker, becomes [o-] after the following processes: the loss of {re-}, a lengthening of the preceding vowel, /ɔ/, to compensate for the {re-} loss – compensatory lengthening (CL) is necessary because the affected/deleted unit is syllabically (and morphemically) significant (Ofori, 2008), and finally the spreading of [+ATR] regressively to a doubly-associated /ɔ/ to convert what should have been [ɔ-ɔ-wu] to [o-o-wu] ‘S/he is dying’.

2.1.2 Nasal and nasalized vowels

Dolphyne (1988) identifies five nasalized vowels in Akan (namely, \tilde{i} , $\tilde{ɪ}$, \tilde{a} , $\tilde{ɔ}$, \tilde{u}). I prefer the term nasal vowels to Dolphyne's usage of the term 'nasalized vowels' (1988: 3-4) for the fact that these vowels do not owe their nasality to an abutting sound – nasal vowels occur after voiceless (non-nasal) consonants in prosaic Akan (Twi) and are lexically contrastive in this domain (e.g. $f\tilde{i}$ 'dirt' contrasts with $f\tilde{i}$ 'to go out'; and $f\tilde{ɪ}$ 'alias', contrasts with $f\tilde{i}$ 'to vomit'). Following are examples of nasal vowels usage in prosaic words.

- (3)
- | | | | | | |
|-----------------|-------------------------------------|----------------------------|----------------------------|-------------------------|---------------------------|
| (a) \tilde{i} | (i) $f\tilde{i}$ 'dirt' | (ii) $p\tilde{i}$ | (iii) $t\tilde{i}$ 'pinch' | (iv) $h\tilde{i}$ | |
| | | 'becomes thick' | | 'waste away' | |
| (b) \tilde{i} | (i) $f\tilde{i}$ 'name' | (ii) $p\tilde{i}$ 'insult' | (iii) $ah\tilde{i}$ | | |
| | | | 'how much' | | |
| (c) \tilde{a} | (i) $f\tilde{a}$ 'half' | (ii) $p\tilde{a}$ 'waist' | (iii) $t\tilde{a}$ 'fart' | (iv) $k\tilde{a}$ 'say' | (v) $h\tilde{a}\tilde{a}$ |
| | | | | | 'pensive look' |
| (d) $\tilde{ɔ}$ | (i) $f\tilde{ɔ}$ 'stupidity' | (ii) $t\tilde{ɔ}$ 'bake' | (iii) $k\tilde{ɔ}$ 'fight' | (iv) $h\tilde{ɔ}$ | |
| | | | | 'body' | |
| (e) \tilde{u} | (i) $s\tilde{u}$ 'cry' ⁴ | | | | |

Nasal / \tilde{u} / in prosaic Akan (Twi) is never used in onomatopoeic ideophones; in its place, we have / $\tilde{ɔ}$ /, the mid back unadvanced nasal vowel.⁵ The following data support the use of these nasal vowels (i.e. / \tilde{i} , $\tilde{ɪ}$, \tilde{a} , $\tilde{ɔ}$, $\tilde{ɔ}$ /).

- (4) / \tilde{i} /: $h\tilde{i}\tilde{i}$ 'noise made by a machine'
- (5) / \tilde{i} /: (a) $p\tilde{i}\tilde{i}$ 'a car horn, the blowing one's nose, or trumpeting'
 (b) $f\tilde{i}\tilde{i}$ ($f\tilde{i}\tilde{i}$) 'pressing a hollow plastic doll hard, or blowing one's nose'
 (c) $p\tilde{ɔ}\tilde{ɔ}p\tilde{i}\tilde{i}$ 'sound of the horn of a car or of trumpeting'
- (6) / \tilde{a} /: (a) $p\tilde{a}\tilde{a}$ 'sound of a horn'
 (b) $f\tilde{a}\tilde{a}f\tilde{a}\tilde{a}$ 'sound of a bird flying'
 (c) $kw\tilde{a}\tilde{a}$ ($kw\tilde{a}\tilde{a}$) 'the cry of a raven'
- (7) / $\tilde{ɔ}$ /: (a) $p\tilde{ɔ}\tilde{ɔ}$ 'sound of a car horn'
 (b) $h\tilde{ɔ}\tilde{ɔ}$ 'sound of a dog; or child weeping'
- (8) / $\tilde{ɔ}$ /: (a) $p\tilde{ɔ}\tilde{ɔ}p\tilde{ɔ}\tilde{ɔ}$ 'sound of the horn of a car'
 (b) $k\tilde{ɔ}h\tilde{ɔ}k\tilde{ɔ}h\tilde{ɔ}$ 'a sick cough (human)'

⁴ The word $h\tilde{u}$ 'see' often cited (Dolphyne, 1988: 4) in support of / \tilde{u} / is very confusing given that $h\tilde{u}$ is underlyingly $hunu$ 'see'. / u / of $h\tilde{u}$ therefore owes its nasality to the following nasal consonant.

⁵ It is still not clear whether or not the ideophone $h\tilde{u}h\tilde{u}h\tilde{u}h\tilde{u}$ 'rumoring' is onomatopoeic; this uncertainty therefore makes the claim to the effect that nasal / \tilde{u} / does not feature in onomatopoeic ideophones in Akan (Twi) not fully settled.

Compared to their prosaic counterparts, vowels must be long in onomatopoeic words in order to be [+Nasal] (the only exception being 8b) - an equally interesting observation is that where we have a short nasal vowel (e.g. 8b), the preceding consonant is [+back].

An equally important feature of onomatopoeic ideophones is the fact that not every nasal consonant transmits/spreads nasality to every neighboring vowel.⁶ In (9) below, the vowels, [ũ], [ĩ], [ã], [õ] and [ɔ̃], owe their nasality to a preceding nasal consonant (i.e. [m] and [ŋ]).

(9)

- | | | | |
|------------------|-----------------------|---------------|---------------------|
| (a) mũũ (mũũ) | ‘cry of a cattle’ | (b) mĩã (mĩã) | ‘the cry of a bird’ |
| (c) mĩãõ̃(mĩãõ̃) | ‘cry of a cat’ | (d) maamaa | ‘a baby crying’ |
| (e) hɔ̃ŋɔ̃hɔ̃ŋɔ̃ | ‘the buzzing of bees’ | | |

Data (10) consist of: (i), for the Akuapem dialect, and, (ii), for the Asante and Akyem dialects of Akan, except for (10g) *kãĩkãĩ*, which I believe is the same across these dialects. The formal difference between (i) and (ii) lies with the fact that final /ŋ/, the velar nasal, in (i) (i.e. in Akuapem) is either [ĩ] or [õ̃] in (ii) (i.e. in the Asante and Akyem dialects) depending on whether the preceding vowel is unrounded or rounded, respectively.

(10)

(a)	(i) pẽŋ	~ (ii) pẽĩ	‘the sound of a stroke on the drum’
(b)	(i) fẽŋ(fẽŋ)	~ (ii) fẽĩ(fẽĩ)	‘hasty hurried steps, leap’
(c)	(i) tõŋ	~ (ii) tõõ̃	‘sound of a stone/pebble falling into a river’
(d)	(i) gbãŋ(gbãŋ)	~ (ii) gbãĩ(gbãĩ)	‘sound of a collision’
(e)	(i) pãŋŋ	~ (ii) pãĩĩ	‘the ringing sound of a bell’ (Christaller, 1933)
(f)	(i) waŋ(waŋ)	~ (ii) wãĩ(wãĩ)	‘sound of hitting (i.e. slapping)’
(g)	(i) kãŋ(kãŋ)	~ (ii) kãĩ(kãĩ)	‘an iron hitting a hanging iron bell’

I consider /ŋ/ as the basic unit (in onomatopoeic forms) that transmits nasality (regressively) to the vowels [ɛ], [ɔ] and [a] in (10) – basic /ŋ/ then vocalizes (to a high nasal unadvanced vowel) afterwards in Asante and Akyem. While /ŋ/ is convertible to [ĩ] and [õ̃] in Asante and Akyem, the two high unadvanced vowels (i.e. [ɪ] and [ʊ]) never precede /ŋ/ in onomatopoeic ideophones (i.e. there is an avoidance of either *Cɪŋ and *Cʊŋ onomatopoeic ideophones). The high advanced vowels, [i] and [u], however, can occur before /ŋ/, but their initial consonant must strictly be a [t] – examples are *tĩŋ(tĩŋ)* or *tũŋ(tũŋ)* both representing the sound of a guitar (less vs. big volume, respectively). /ŋ/ transmits nasality to [i] and sounds quite alveolar (i.e. [n]) in the Asante and Akyem dialects (i.e. *tĩntĩn* and *tũntũn* ‘sound of a guitar’).⁷ As a reminder, not every nasal consonant transmits nasality to every neighboring vowel. In the following data, neither /m/ or /ŋ/ transmits nasality to a preceding vowel.

⁶ This is also true for prosaic words, for example, /n/ does not transmit nasality to /e/ in the word *anene* ‘raven’, and /m/, to /o/ in the word *mo* ‘well done’.

⁷ Also, /i/ is nasalized in *kĩŋkĩreŋ*; *tĩnĩ(tĩnĩ)* ‘sound of a guitar’ here with /i/ nasalized is possible, but the basic structure is not CVC.

Data (11) illustrate the fact that /ŋ/ does not transmit nasality to either [e] (in 11a) or [o] in (11b) - immediately after data (11a/b) are some restrictions on initial consonant selection for [e] and [o] in a /C₁VC₂/ onomatopoeic structure.

- (11)
- | | | | |
|-----|-------|-----------|---|
| (a) | (i) | peŋ(peŋ) | ‘expressive of breaking of stick barehanded’ ⁸ |
| | (ii) | teŋ(teŋ) | ‘a rope breaking as a result of stretching it’ |
| | (iii) | keŋ(keŋ) | ‘sound of a drum; a metallic tube’ |
| | (iv) | *feŋ(feŋ) | |
| | (v) | *seŋ(seŋ) | |
| | (vi) | *heŋ(heŋ) | |
| (b) | (i) | poŋ(poŋ) | ‘a bamboo, etc. breaking with pressure’ |
| | (ii) | toŋ(toŋ) | ‘cutting a bamboo’ |
| | (iii) | koŋ(koŋ) | ‘sound from a metallic tube
(more voluminous than keŋkeŋ)’ |
| | (iv) | *foŋ(foŋ) | |
| | (v) | *soŋ(soŋ) | |
| | (vi) | hoŋ(hoŋ) | ‘the sound after dismantling the blade of a hoe’ |

With the structure /C₁eŋ/ (i.e. 11a) C₁ is always a voiceless plosive (either, p, t, or k); with [o] as the vowel of the CVC (i.e. with /C₁oŋ/) C₁ is either a voiceless plosive (p, t, k) or a voiceless back consonant (k or h; because [o] is a back vowel). In the same vein, [m] does not transmit nasality to [o] in (12b/i), (12b/ii), and (12b/vii), which are the only licit onomatopoeic ideophones in (12a) and (12b) – as obtained in (12a), [m] is never preceded by [e] – [e] is strictly followed by /ŋ/. The advanced non-high rounded vowel [o] takes either a voiceless labial non-back consonant, or the voiced labial consonant as C₁ (i.e. with [m] as its final consonant).

A final /m/ can never be preceded by [e] (as shown in 12a), but can be preceded by [o] in forms (12b/i) *bombom*, (12b/iv) *fomfom*, and (12b/vii) *womwom*. [o] is not nasalized; discussed immediately after data (12a) and (12b) are restrictions on initial consonant selection for the structure /C₁oŋm₂/.

- (12)
- | | | | | | | | | | |
|-----|-----|----------------------|------------|------------|-----------|------------|----------|-------------------------------|--|
| (a) | (i) | *pem(pem); | (ii) | *tem(tem); | (iii) | *kem(kem); | (iv) | *fem(fem); | |
| | | (v) | *sem(sem); | (vi) | *hem(hem) | | | | |
| (b) | (i) | *pom(pom) → bom(bom) | (ii) | *tom(tom) | (iii) | *kom(kom) | (iv) | fom(fom) | ‘sound of the fire of lantern going out’ |
| | | (v) | *som(som); | (vi) | *hom(hom) | (vii) | wom(wom) | ‘the sound of kicking a ball’ | |
| | | | | | | | | ‘kick a ball’ | |

⁸ /pem/ appears in *pempereperepe* ‘sound of guitar’ in a popular Ghanaian song with the title: *ɔdɔ-ye-wu e!* ‘Nothing except death will put us apart’

With a final-[m], [o], which, just like final-[m], is [+labial], promotes labiality over non-labiality (which is the reason why most forms are illicit in 12b); the preferred C₁ candidates, therefore, are [p, b, f, and w]. Final [m] (a voiced labial) has the final say in this in promoting a voiced labial over a voiceless one. What this means is that [o] selects (i.e. cooccurs with) a voiceless labial consonant, however, its voiced labial counterpart (if available) is preferred for the fact that [m] is voiced labial. *Fomfom* remains *fomfom* and cannot become *vomvom* probably because [v] is underlyingly non-existent in Akan or otherwise. *Pompom* becomes *bombom* because the [p] vs. [b] pair exists in Akan – the requirement that [o] selects a voiceless C₁ was therefore achieved but became affected/colored by the fact that [p] has to change to [b] to harmonize with final [m] in voicing and labiality.⁹ *Wom(wom)* ‘the sound of kicking a ball’ (in 12b/vii) remains the same because [m] finds [w] a perfect match (i.e. they are both [+labial] and [+voiced]).

Data (13-19) test the possibility of [m] following [i, ɪ, u, ʊ, ε, ə, a] in what is also a /C₁Vm₂/ onomatopoeic structure, and (regressively) transmitting its nasal quality to them. The vowels group into two, namely, high vowels ([i, ɪ, u, ʊ]), and non-high unadvanced vowels ([ε, ə, a]). According to the data (i.e. 15), none of these vowels are [+nasal] with the exception of [a] in the words, (19f) *hām(hām)* ‘gallop food down one’s throat’, and (19g) *teāmteām* ‘expressive of the sound of the train.’ Information on C₁ selection follows each data type.

- (13) (a) (i) *pim(pim)
 (ii) bim(bim) ‘the sound beating or striking (usually at the back)’
 (b) (i) tim(tim) ‘pounding of fufu; fruit falling from a tree intact;
 a fist hit at the back’
 (ii) dim(dim) ‘a fist hit at the back of someone’
 (alternates with *timtim* sense 3)
 (c) (i) kim(kim) ‘heavy footsteps or hitting’ (alternate with *gimgim*)
 (ii) gim(gim) ‘heavy footsteps or hitting’ (alternate with *kimkim*)
 (d) sim(sim) ‘expressive of a manner of walking’
 (e) *fim(fim)
 (f) *himhim
 (g) ε^wim(ε^wim) ‘noise of a car – sound end(i.e. delimitation)’

There is an avoidance of either a voiceless labial consonant or a back non-velar consonant as C₁ in (13). *Tim(tim)* and *kim(kim)* are well-known to most people I spoke with than *dim(dim)* and *gim(gim)*. Some speakers believe that *gim(gim)* is simply an alternant of *kim(kim)* with *kim(kim)* as the main thing; as well as *dim(dim)*, and *tim(tim)* in its third sense, which is ‘a fist hit at the back’. From these positions, C₁ can simply be established as basically voiceless (either a non-labial or a non-glottal); for a C₁ to be labial it must as well be voiced, and explains why *bimbim* (13a/ii) is our output, as opposed to **pimpim* in (13a). (14) has the structure /Cum/ -- with [u] (high rounded advanced) not nasalized.

⁹ Alternatively, ‘vibration encoding’ could be a more plausible reason why voiced labials are preferred over voiceless consonants here.

- (14) (a) (i) pum(pum) ‘as a result of hammering; expressive of a door knock’
 (ii) bum(bum) ‘expressive of a door knock’
 (comes with a shaking/vibration of door)
 (b) (i) tum(tum) ‘pounding of fufu, fruit falling from a tree intact;
 a fist hit at the back’
 (ii) dum(dum) ‘a fist hit at the back of someone’
 (c) (i) kum(kum) ‘hitting of a wooden board or a bug drum; as a result of
 hammering’
 (ii) gum(gum) ‘the pounding of the table with a fist’;
 as a result of hammering’
 (d) *sum(sum)
 (e) fum(fum) ‘sound of kicking a ball’
 (f) *hum(hum)

A consonant that is both [-Labial] and [-Plosive] cannot serve as C₁ in (14). A consonant must have the following place and manner combinations to be C₁ – either [-Labial, +Plosive], or [+Labial, –Plosive], or [+Labial, +Plosive]. Voiceless and voiced plosives may both function as C₁.

Featured in (15) and (16) are the vowels [ɪ] and [ʊ], respectively, both of which cannot be succeeded by [m] in a /CVC/ onomatopoeic structure and is the reason why these forms are illicit; [ɪ] and [ʊ] are high unadvanced vowels (front and back, respectively).

- (15) (a) (i) *pɪm(pɪm) (ii) *bɪm(bɪm)
 (b) (i) *tɪm(tɪm) (ii) *dɪm(dɪm)
 (c) (i) *kɪm(kɪm) (ii) *gɪm(gɪm)
 (d) *sɪm(sɪm)
 (e) *fɪm(fɪm)
 (f) *hɪmhɪm
- (16) (a) (i) *pʊm(pʊm) (ii) *bʊm(bʊm)
 (b) (i) *tʊm(tʊm) (ii) *dʊm(dʊm)
 (c) (i) *kʊm(kʊm) (ii) *gʊm(gʊm)
 (d) *sʊm(sʊm)
 (e) *fʊm(fʊm)
 (f) *hʊmhʊm

(17) has the structure /Cɛm/ with two onomatopoeic possibilities, (17a/ii) and (17b/i), out of nine cases – C₁ is either [b] or [t]. (18) has the structure /Cɔm/ and has a single possibility with [b] functioning as C₁ in (18a/ii). Neither [ɛ], nor [ɔ], (both mid unadvanced) is nasalized before [m].

- (17) (a) (i) *pɛm(pɛm) (ii) bɛm(bɛm) ‘expressive of manner in which one was hit’
 (b) (i) tɛm(tɛm) ‘falling of a soft fruit from a tree; walking – usually barefooted’; (ii) *dɛm(dɛm)
 (c) (i) *kɛm(kɛm); (ii) *gɛm(gɛm);
 (d) *sɛm(sɛm);

- (e) *fɛm(fɛm);
 - (f) *hɛmhɛm
- (18)
- (a) (i) *pɔ̃m(pɔ̃m)
(ii) bɔ̃m(bɔ̃m) ‘sound of someone falling; or expressive of walking’
 - (b) (i) *tɔ̃m(tɔ̃m); (ii) *dɔ̃m(dɔ̃m);
 - (c) (i) *kɔ̃m(kɔ̃m); (ii) *gɔ̃m(gɔ̃m)
 - (d) *sɔ̃m(sɔ̃m)
 - (e) *fɔ̃m(fɔ̃m)
 - (f) *hɔ̃m(hɔ̃m)

Onomatopoeic possibilities in (19) with the structure /Cam/ are (19a/ii), (19b/i), (19d), (19e), (19f), and (19g), i.e. six possibilities out of 10 cases with [ã] nasalized in the last two possibilities. From the data, (19a/i) is unacceptable; (19a/ii) instead is preferred.

- (19)
- (a) (i) *pam(pam); (ii) bam(bam) ‘striking/clapping/lashing/falling’
 - (b) (i) tam(tam) ‘manner of walking – usually barefooted’
(ii) *dam(dam)
 - (c) (i) *kam(kam); (ii) *gam(gam)
 - (d) sam(sam) ‘sound of sand or pebbles being poured out in large quantity’
 - (e) fam(fam) ‘throwing a thick wet soil against a wall’
 - (f) hãm(hãm) ‘gallop food down one’s throat’
 - (g) tɛãmtɛãm ‘in imitation of the sound of the train’

So far only [u] is known to take either [p] or [b] as C₁ with a /CVm/ structure; the rest of [m]-final CVC ideophones (with the vowels, [i, o, ɛ, ɔ, a]) prefer the voiced bilabial plosive over its voiceless counterpart. On the contrary, [p] is preferred over [b] as C₁ in the ideophonic structures: /Cem/, /Ceŋ/ and /Coŋ/, i.e. before [e], or [o] followed by /ŋ/. Most native speakers think (19b/i) *tam(tam)* is just an alternant of (17b/i) *tɛm(tɛm)* ‘falling of a soft fruit from a tree – breaks to the ground, or manner of walking – usually barefooted’ and that the latter is the better alternative. What this means is that the onomatopoeic structure /Cam/ basically takes either a voiceless strident (i.e. [f], [s], [h] and [tɕ]), or the voiced bilabial stop (plosive) as C₁; [a] is nasal(ized) with a posterior voiceless strident C₁ (i.e. [h] and [tɕ]), and non-nasal(ized) with an anterior voiceless strident C₁ (i.e. [f] and [s]) – posterior voiceless stridents are strictly either back non-labial (i.e. [h]), or affricate non-labial (i.e. [tɕ]); anterior voiceless stridents can be labial.

2.1.3 Vowel sequence in CVV and CVCV(C)(V) onomatopoeic ideophones

Dolphyne (1988: 8-25) provides a very detailed account of vowel sequences and processes in Akan. Our goal in this subsection is to establish the extent to which vowel sequences in onomatopoeic ideophones, specifically /CVV/ and /CVCV/ onomatopoeic ideophones, are similar to, or different, from vowel sequences in prosaic word/phrase forms.

As obtained from (20a-i), a sequence of two identical vowels with all nine oral vowels phonemes of Akan (Twi) (namely: [i, ɪ, u, ʊ, ɛ, ɛ̃, e, o, a]) is just as possible in onomatopoeic ideophones as in prosaic word forms.

(20) CVV structure: Identical vowels

(20a) [ii]:	(i) pii	‘horn of a car’
	(ii) eɣii(eɣii)	‘noise of a fleet of cars – sound is constant’
	(iii) hĩĩ	‘noise made by a machine’
(20b) [ɪɪ]:	(i) pɪɪ	‘sound of a car horn’
	(ii) fĩĩ(fɪɪ)	‘pressing a hollow plastic doll hard, or of blowing one’s nose’
	(iii) kwɪɪ(kwɪɪ)	‘the cry of a pig’
	(iv) kwĩĩ(kwĩĩ)	‘a creaky door’
	(v) hĩĩ	‘snoring; also, <i>hõõ</i> ’
	(vi) ɛɪɪ	‘difficulty breathing due to asthma’
	(vii) tɛɪɪ	‘frying’
	(viii) tɛɣɪɪ(tɛɪɪ)	‘laughter, or the sound of a chirping bird’
	(ix) ɲɣĩĩ(ɲɣĩĩ)	‘raining/drizzling intermittently’
(20c) [uu]:	(i) tuu(tuu)	‘hit with a fist’
	(ii) kuu(kuu)	‘the cry of a (big) bird’
	(iii) huu	‘sound of a car’
	(iv) vũũ(m)	‘sound of an engine (i.e. car)’
	(v) muu(muu)	‘cry of a cattle’
(20d) [ʊʊ]:	(i) pũũ	‘sound of a car horn’
	(ii) kʊʊ(kʊʊ)	‘stomach growling’
	(iii) fʊʊ(fʊʊ)	‘air coming of something – a ball or the human anus’
	(iv) hũũ	‘sound of a dog; or child weeping; snoring’
(20e) [ɔɔ]:	(i) pɔɔ	‘footsteps; the sound of shooting or drumming’
	(ii) pɔɔpĩĩ	‘sound of the horn of a car’ or ‘... of trumpeting’
	(iii) pɔɔĩĩ(pɔɔĩĩ)	‘sound of the horn of a car’
	(iv) tɔɔ	‘hit something on another when playing’
	(v) kɔkɔkɔ	‘the sound of knocking’
	(vi) jɔɔ(jɔɔ)	‘footsteps of a crowd’
(20f) [oo]:	(i) póó(poo)	‘a gunshot’ (It alternates with <i>pow(pow)</i> .)
	(ii) pòò	‘a hit; a deflation – object in deflation bigger than that of <i>tòò</i>
	(iii) tóó(too)	‘a gunshot’ (alternates with <i>tow(tow)</i>)
	(iv) tòò	‘a hit; a deflation’ – object smaller than that of <i>pòò</i>
	(v) woowo	‘a dog bark just like <i>wow(wow)</i> ’
(20g) [ee]:	(vi) oowóò	‘the sound of yawning’
	(i) pee	‘expressive of a gunshot’ (a big gun – with a big barrel)
	(ii) tee	‘expressive of a gunshot’(a small gun – small barrelled)
(20h) [aa]:	(i) paa	‘a strike/smite’
	(ii) pãã	‘sound of a horn’

(iii) fããfãã	‘sound of a bird flying’
(iv) kwãã(kwãã)	‘the cry of a raven’
(v) tɛɔaa (~dzɔaa)	‘sound of water pouring down’
(vi) tɛɔaa(tɛɔaa)	‘cry of some birds or of fowls’
(vii) dzɔaa (~ guaa [gwaa])	‘sound of water pouring down’
(viii) guaa [gwaa] ~ [dwaa]	‘the pouring of water’
(ix) mããmãã	‘expressive of a baby crying’
(x) waa	‘the rushing sound of trees agitated by the wind or in falling, or cutting with a knife or scissors.’
(20i) [ɛɛ]: (i) pɛɛ (pɛɛpɛɛ)	‘a hit on the head with palm open’
(ii) kɔɔ(ɛ)	‘sound of hitting the head with a knock’
(iii) bɛɛ(bɛɛ)	‘sheep/goat bleating’ (alternates with <i>mɛɛmɛɛ</i>)
(iv) mɛɛmɛɛ	‘sheep/goat bleating (alternates with <i>bɛɛbɛɛ</i>)
(v) ŋɛɛŋɛɛ	‘sound of a (new) baby crying’

The majority of the /CVV/ onomatopoeic ideophones employ voiceless consonants (i.e. [p, t, k, ɛɔ, h, f, kw ~ kɔ, tɛɔ]) as C₁.¹⁰ Of these consonants [p] is the most used (i.e. 12 cases as C₁), followed by [t] (with five cases), followed by [k, kw, f, h, tɛɔ] each with three cases, followed by [ɛ, ɛw, tɛ] each with one case; the voiceless consonants [s], and [sq] are never used. The following voiced consonants are used as C₁: [ɲɔ, v, m, j, w, dzɔ ~ gu ~ gw, b, ŋ], i.e. eight of them. Of the eight voiced consonants, [m] is the most used with three cases as C₁, followed by [w] with two cases, followed by [b, v, dzɔ, ɲɔ, ŋ, j] with one case each. The voiced consonants, [d, g, gb, ɲ, and r], never occur as C₁ in data (20). What this means is that a /CVV/ onomatopoeic form (vowels being identical) is more likely to have [p] as C₁ than [t], [t] as C₁ more than [k, kw, f, h, tɛɔ, m], with [k, kw, f, h, tɛɔ, m] as C₁ more than [w], with [w] occurring as C₁ more than [b, v, ɛ, ɛw, tɛ, dzɔ, ɲɔ, ŋ, j]. The sounds [d, g, gb, s, sq, ɲ, r] are never used in /CVV/ onomatopoeic forms.

Following is a ranking of identical vowels in /CVV/ forms from the most commonly used to the least commonly used sequence: [aa] >> [ɪɪ] >> [uu], [oo], [ɛɛ], [ɔɔ] >> [ʊʊ] >> [ii], [ee]. The hierarchy becomes more elegant if we let [ɛɛ] join [ii] and [ee] at the bottom of the hierarchy (for the fact that [ɛɛ] has very limited distribution) as shown below: [aa] >> [ɪɪ] >> [uu], [ʊʊ], [oo], [ɔɔ] >> [ii], [ee], [ɛɛ] – with non-mid non-ATR vowels (i.e. a, ɪ) being the most used identical sequence followed by rounded/back vowels, followed by front vowels.¹¹ The following shows vowel preferences for possible C₁s. C₁s are arranged from the most used to the least used C₁: [p] = [ɔ > a, o > ɪ, ɛ, ʊ, i, e] >> [t] = [o > ɔ, u, e] >> [k] = [ɔ, u, ʊ], [kw] = [a, ɪ, ɛ], [f] = [a, ɪ, ʊ], [h] = [i, u, ʊ], [tɛɔ] = [a > ɪ], [m] = [a, ɛ, u] >> [w] = [a, o] >> [b] = [ɛ], [v] = [u], [ɛ] = [ɪ], [ɛw] = [i], [tɛ] = [ɪ], [dzɔ] = [a], [ɲɔ] = [ɪ], [ŋ] = [ɛ], [j] = [ɔ].¹²

¹⁰ The sound [kɔ] is a variant of /kw/ before a front vowel.

¹¹ The following shows which consonants serve as C₁ of which vowel on the vowel hierarchy – a hierarchy from the most to the least used vowel: Low (C_{p-2/kw-1/f-1/tɛɔ-2/dzɔ-1/m-1aa}) >> High Front Unadvanced (C_{p-1/kw-1/f-1/ɛ-1/tɛ-1/tɛɔ-1/ɲɔ-1/ɪɪ}) >> Mid Back +/-Advanced (C_{p-3/t-1/k-1/j-1/ɔɔ}; C_{p-2/t-2/w-1oo}) >> Mid Front Unadvanced (C_{p-1/b-1/kw-1/m-1/ŋ-1ɛɛ}), High Back Advanced (C_{t-1/k-1/h-1/v-1/m-1uu}) >> High Back Unadvanced (C_{p-1/k-1/f-1/h-1ʊʊ}) >> High front Advanced (C_{p-1/ɛ-1/ɛw-1ii}) >> Mid Front Advanced (C_{p-1/t-1ee})

¹² A comma ‘,’ separates any two units with the same number of occurrence; ‘>’ means a vowel occurs more than; ‘>>’ has been used for ‘a consonant occurs more than’.

The above onomatopoeic data also have sequences of two identical nasal vowels such as /ĩĩ, ũũ, ññ, õõ, ðð, and ãã/; the sequences, /εε, ee, oo/, do not have nasalized counterparts. An interesting, and also a very familiar phenomenon in Akan linguistics, is the fact that nasal vowels are preceded/initiated by a voiceless consonant. A voiced consonant does not precede a vowel (i.e. [+nasal]) unless the voiced consonant, just like the vowel is [+nasal] and, is the reason for vowel nasality as in (20e/ix) *mããmãã* ‘expressive of a baby crying’. Vowel nasality is contrastive after a voiceless consonant just like in prosaic Akan (e.g. (20h/i) *paa* ‘a strike/smite’, and (20h/ii) *pãã* ‘sound of a car horn’). However, there is a strict requirement on nasal vowels in onomatopoeic ideophones (as opposed to nasal vowels in prosaic Akan) to always be long.

In (21a) and (21b) are sequences of non-identical VV in a /CVV/ ideophonic structure. Vowel sequences in (21a) have the structure /V_[+high]V_[-high]/, i.e. a high vowel followed by a non-high vowel. The abutting vowels agree in [round], and [ATR] with the exception of the /ia/ sequence in the second half of (21a/i), however, [+ATR] harmony is respected in the first half of (21a/i) [kɥie...].

(21a) CVV structure: Non-identical vowels

- | | |
|-----------------------|-----------------------------------|
| (i) kɥie(kɥia) | ‘expressive of manner of walking’ |
| (ii) tɛɣoo | ‘applying break’ |
| (iii) sɥie (from swɛ) | ‘the cry of a baby chick’ |
| (iv) mia(mia) | ‘the cry of a bird’ |
| (v) miaw(miaw) | ‘cry of a cat’ |

In (21b) is the VV structure in (21a) reversed with a non-high vowel preceding a high one (i.e. /CV_[-high]V_[+high]/). Forms in (21b) are underlyingly C₁VC₂ (see discussion on (10)) with the second C being either an [ŋ] or [w] vocalized to [ĩ] and [õ].

- | | |
|--------------------|---|
| (21b) (i) wãĩ(wãĩ) | ‘hitting (i.e. slapping)’
(a variant of <i>wan(wan)</i> , <i>wãĩ(wãĩ)</i> is better) |
| (ii) pãĩ(pãĩ) | ‘a bell; ‘sound of a collision or hitting’ (a variant of <i>pãŋŋ</i>) |
| (iii) fẽĩ(fẽĩ) | ‘hasty hurried steps, leap’ (alternates with <i>fẽŋ(fẽŋ)</i>) |
| (iv) kãĩ(kãĩ) | ‘an iron hitting a hanging iron bell’ |
| (v) tɛawtɛaw | ‘walking on dry leaves’ (alternates with <i>tɛawtɛaw</i>) |

From the above argument, true VV sequences in /CVV/ onomatopoeic ideophones are either underlyingly (i) identical, or (ii) non-identical with a high and non-high vowel sequence.

2.1.4 Vowel sequence in CVCV(C)(V) onomatopoeic ideophones

Vowels in /CVCV/ onomatopoeic forms from (22a-h) are identical, that is, if the vowel of the first syllable (which is CV) is [i] then that of the second is also [i], and such is the case with each of the following eight vowel phonemes, [i, u, ɪ, ʊ, ε, ɔ, o, a]. As obtained in (22d) and (22g), /CVCV/ onomatopoeic ideophones with [ʊ] and [o] are very scanty. I have not come across a /CeCe/ form, but will not rush to rule it out as a possibility. /CiCi/ (22a) and /CuCu/

(22b) are the most common onomatopoeic forms, followed by /CaCa/ (22h) - after these three structures come the following forms in their order of ranking: /CɔCɔ/ (22f), /CɪCɪ/ (22c) >> /CɛCɛ/ (22e) >> /Cɔ̃Cɔ̃/ (22d) and /CoCo/ (22g). Of the unadvanced vowels, [a] is the most used and [ɔ̃], the least used; [i] and [u] are the most used advanced vowels, [o], the least used, and [e] is never used in /CVCV/ onomatopoeic forms.

(22) V₁ and V₂ are identical

(a) /CiCi/:	(i) pipii	‘horn of a car’
	(ii) pibipibi	‘torrential rainfall’
	(iii) pitipata	‘pounding of fufu’ (Christaller 1933)
	(iv) kit(i)rikit(i)ri	‘turbulent or violent commotion’ (~ <i>kikirikikiri</i>)
	(v) kiŋk(i)reŋ(kiŋk(i)reŋ)	‘the ringing of a bell’ – a big bell
	(vi) sisisisi	‘sound made by insects’
	(vii) tɛ(i)riditeiridi	‘a crowd running’ (~ <i>jiridi(jiridi)</i> ~ <i>jirididididi</i>)
	(viii) birim ~ brim	‘a sudden fit, start’
	(ix) gidigidí	‘running around energetically’ (also, <i>gigigigi</i>)
(b) /CuCu/:	(i) pupupupu	‘a noise in one’s belly’
	(ii) p(u)rum ~ b(u)rum	‘something heavy falling’ (/b/ initial denotes shaking)
	(iii) putu(putu)	‘the sound of drumming repeatedly’ (Christaller 1933)
	(iv) puhũ(puhũ)	‘sound of a cough’
	(v) tutututu	‘the sound of boiling water’
	(vi) kuk(u)ru(kuk(u)ru)	‘sound of a rat in a hole’
	(vii) hũhũhũhũ	‘rumoring; a message spreading secretly’
	(viii) bububu	‘calling, crying, shouting; shooting’ (Christaller 1933)
	(ix) w(u)rudu(w(u)rudu)	‘animal in a hole; forcing a stick into a hole’
(c) /CɪCɪ/:	(i) pɪpɪ	‘sound of a car horn’
	(ii) kɪk(ɪ)rɛ(kɪkrɛ)	‘the turning of a key to open a door’
	(iii) kɪkɪkɪkɪkɪ	‘laughter’
	(iv) fɪtɛ(ɪ)rɪfɪtɛ(ɪ)rɪ	‘opening/unscrewing something’
(d) /Cɔ̃rɔ̃/:	pɔ̃rɔ̃pɪraa ~ prɔ̃pɪraa	‘cutting up an animal, stripping off its skin, rustling leaves’
(e) /CɛCɛ/:	(i) pɛpɛ	‘a sound of cutting a cloth or hair with scissors’
	(ii) tɛtɛtɛtɛ	‘sound of quick footsteps, or sound of fire burning’
	(iii) kɛkɛ (kɛkɛ)	‘clock ticking; sticks hitting each other for a musical effect’
(f) /CɔCɔ/:	(i) pɔpɔpɪ	‘a horn – car or trumpeting’
	(ii) kɔkɔkɔkɔ	‘the cry of a bird (chicken)’

shows the connection between the two sounds and the fact that [tɛ] was indeed, historically, [k] and [j] fused together to stop what had started as back vs. alveolar plosives neutralization in the language.

Following is a brief account of the permissible consonant structure of CVCV forms in (22). Initial consonants are largely voiceless (i.e. p, t, k, kɔ; f, s, h; tɛ ~ j); the only voiced initial consonants are [b] and [g] with very limited usage; [b] is C₁ for [i, u, a] and [g], a C₁ for [i]. A voiceless C₁ co-occurs with a voiceless C₂ (with the exception of [p] selecting [b] in a single instance or with the exception of [p] and [k] selecting [r] as C₂); a voiced C₁ strictly selects a voiced C₂. A voiceless C₁ and C₂ usually agree in their manners of articulation: C₁ plosives largely select C₂ plosives. [p] is the most used C₁ followed by [k], followed by [t] followed by [h], which is never a C₁ for non-back/unrounded vowels (in the CVCV structure) and [f], which is restricted to occur before [a] and [ɪ].

(23) concerns /CVCV/ onomatopoeic forms whose initial and second vowels are non-identical. The data has been grouped into four. (27a-c) have the structure: /CV_[+high]CV_[-high]/; their initial vowels are [+high] and the second, [-high]. V₁ and V₂ in (27a) are both unrounded and [-ATR].

(27) V₁ and V₂ are non-identical

- | | | | |
|-----|-------|------------------------|---|
| (a) | (i) | pɪpɪpɪpá | ‘expressing the sound of breaking’ |
| | (ii) | prapraprapra | ‘handclap’ (probably from: *pIrapIrapIrapIra) |
| | (iii) | bɪram ~ bram | ‘of a person falling’ |
| | (iv) | tɪtɪtɪtɪ | ‘sound of rain drops on a roofing sheet’ |
| | (v) | kɪkɛkɪkɛ | ‘the sound of the trigger of a gun’
(also, kɪkɛkɪkɛ) |
| (b) | (i) | pupopùpó | ‘expressive of two people hitting each other’ |
| | (ii) | turoŋ | ‘denotes the sound of the dawuru’ |
| | (iii) | kurohi(ko) ~ krohi(ko) | ‘sound of the loom used in kente weaving’ |
| | (iv) | tɛ(u)rododododo | ‘when urinating into water (e.g. the W/C)’ |
| (c) | | pɔpɔpɔpɔ | ‘expressive of a fist fight’ or ‘of clapping of hands’ |
| (d) | (i) | saw(u) → [sàw(u)] | ‘the sound of a net being cast into the sea’ |
| | (ii) | kokuròkóó | ‘sound made by the roaster’ (also, kokrokoo) |

In (27b), V_{1[+high]} and V_{2[-high]} are both rounded and also [+ATR]; in (27c), high V₁ and non-high V₂ are both [-ATR], but have opposite values for rounding. Vowels in the /#CVCV/ domain in (27d) are non-high and high, respectively. In (27d/i) *saw(u)* is a case of central low advanced V₁ followed by the high rounded advanced vowel – the advancement of the low central is phonetic, triggered by the second vowel [u], which deletes afterward. The onomatopoeic ideophone, *saw(u)* derives from the name of the sound emitting entity, *asaw(u)* ‘the fishing net.’ In (27D/ii), both non-high V₁ and high V₂ are rounded.

From the above, if V₁ and V₂ are going to be disharmonious on any feature it is largely on height; the most preferred order being a high V₁ succeeded by a non-high V₂. The inverse is possible, but on a minimal scale. If V₁ and V₂ agree on a feature, it is either [-ATR] or [+ATR]. Technically/generally, opposite values of [ATR] are never combined in a /CVCV/ onomatopoeic domain, and if such an illicit vowel combination exists, it is always [ia], and minimally distributed. The next significant feature the two vowels may share is

[± round]. From the above data, onomatopoeic word forms are acting in obedience to advanced tongue root and rounding harmony just like prosaic Akan (Twi) words/forms. These onomatopoeic ideophones even exhibit height dissimilation, a feature common to Akan verbs, and especially more noticeable in Akan CV and some CVC verb reduplication (Ofori, forthcoming), and, on this, are structurally just like non-ideophonic word forms of the language.

2.1.5 Some general observations on vowels and vowel usage

It is quite fascinating that technically none of the ten vowel sounds in Akan (Twi) can feature in the initial position of onomatopoeic words, which is one of the ways onomatopoeic ideophones are different (i.e. in terms of word initial, medial, and final distribution of vowels).

On nasal vowels, there are five of them: [ĩ, ã, ỹ, õ, ɔ̃] – [ũ], and not [ɔ̃] is the fifth nasal vowel in prosaic Akan. These onomatopoeic nasal vowels, just like their prosaic counterparts, strictly occur after voiceless consonants – the non-mid non-advanced of these vowels ([ĩ, ã]) take either a voiceless labial consonant, or a voiceless back consonant (i.e. [p, f, kw, h]) as C₁. [ĩ] is the only advanced vowel on the list that occurs after [h]; rounded unadvanced vowels, [õ] and [ɔ̃], follow either [p], [k], or [h]. That is, these voiceless non-coronals followed by these vowels form the sequence: C_[+consonantal, +back, -labial]V_[-consonantal, +back, +labial], and C_[+consonantal, -back, +labial]V_[-consonantal, +back, +labial]. In other words, a vowel harmonizes with its preceding consonant in either labiality or in backness. With the rankings: [ĩ >> ã >> ỹ] (for non-round/non-labial/non-back vowels); and /Labial (p, f, kw) >> back fricative (h)/ (for the consonants that often precede these vowels), we can neatly capture the non-round/non-labial/non-back C₁ selection, with [ĩ] being the highest on the hierarchy as a result of it taking all four consonants ([p, f, kw >> h]) as C₁; with [ã] being the second ranked vowel for taking the first three consonants as C₁; with [ỹ] ranking least for taking as C₁ the least ranked consonant ([h]).

The vowels, [ĩ, ã, ỹ], are non-labial/non-back, and so, require that a preceding consonant is either [+labial] or [+back] (or even a combination of the two features, [+labial, +back]/kw). That is, these vowels and their preceding consonants are in some kind of feature dissimilation.

We also observed how nasal spreading from a consonant to an abutting vowel is progressively always possible, but regressively very restricted. [m] and [ŋ] are the main triggers in the latter instance – only high rounded ([u, ʊ]) and non-mid non-advanced ([a, ɪ]) vowels can be targeted for nasality before [m]. [ŋ], on its part, targets preceding non-high non-advanced vowels ([ɛ, ɔ, a]) only.^{15,16}

The following numbers capture sound frequency after initial consonants (i.e. /#C__): [u] (29), [a] (29), [i] (22), [ɪ] (21), [ɔ] (14), [ɛ] (11), [o] (8), [ʊ] (6), [e] (3), ([æ] 1 – derives from [a]). That is, with the exception of [ʊ], the non-mid vowels (i.e. [u, a, ɪ, i]) are the most used vowels as V₁, followed by mid unadvanced [ɔ] and [ɛ]; [o] is used more than [ʊ]; [æ] is

¹⁵ The onomatopoeic data looked bizarre at first sight. It is therefore very astounding how we have been able to address the phonological questions of this study.

¹⁶ Why /ũ/ before /m/ when a nasal /ũ/ is not possible and why /õ/ never occurs before /ŋ/: /ũ/ before /m/ is possibly a fusion of nasal /ĩ/ and /ɔ̃/; and /õ/, possibly a reduction of rounded nasal /õ̃/ and /ɔ̃/ before /ŋ/.

the least used after [e]. In terms of distribution, [e] (the front mid advanced vowel) does not occur either before or after [m] or [b]. The occurrence of [æ] is possible because an ideophone is an imitation of the sound and at the same time the name of the sound producing entity (i.e. [asæw(u)] ‘fishing net’; [sæw] ‘the ideophone’).

Now, on linear contiguous and discontinuous organization of vowels: Table (28) below is adapted from Dolphyne (1988:9).

(28) Permissible vowel sequences at the word level

	i	ɪ	e	ɛ	a	ɔ	o	ʊ	u
i	ii		ie	iɛ	ia		io		
ɪ		ɪɪ		ɪɛ	ɪa				
e	ei		ee						
ɛ		ɛɪ		ɛɛ					
a		aɪ			aa				
ɔ		ɔɪ				ɔɔ			
o	oi						oo		
ʊ		ʊɪ		ʊɛ	ʊa	ʊɔ		ʊʊ	
u	ui		ue		ua		uo		uu

Sequences that are possible in onomatopoeic forms are highlighted. Onomatopoeic forms, just like prosaic words, allow sequences of identical vowels with all nine vowels. For sequences of non-identical vowels, we can argue that the [ie] vowel sequence derives from /ia/ after reduplication and regressive [+ATR] spreading (e.g. /kɔɪa/ → [kɔɪekɔɪa] ‘expressive of manner of walking’). The [ɛɪ] and [aɪ] vowel sequences are nasalized in actual usage because they are derived from /Cɛŋ/ and /Caŋ/, respectively. We talked about the fact that a final /ŋ/ in Akuapem is either [ɪ] or [ɔ̃] in Asante and Akyem dialects of Akan.

From the above observations, true, underlying, non-identical onomatopoeic vowel sequences are [ia], [iɛ], [ɪa], and [uo], which are just four out of about nineteen different non-identical VV possibilities in prosaic Akan. These non-identical onomatopoeic vowel sequences are unique in always requiring a high vowel (which is strictly [ɪ >> i, u], i.e. with [ɪ] occurring most of the time) to be followed by a non-high vowel (namely, [a], [ɛ], or [o]; [a] being the commonly used one). The two vowels must both be either rounded or unrounded. Interestingly, both [iɛ] and [ɪa] are associated with animals ([iɛ] for a small bird, and [ɪa], for a bird bigger than the first bird and the cat) – both vowels are unrounded and also unadvanced.¹⁷ [ia] has to do with ‘walking,’ and [uo], the application of a car’s break. [ia] captures the human, that is, something bigger than the entity whose sound the [iɛ] sequence captures; and [uo], two back vowels both advanced, depict something bigger (than the bird represented by [iɛ] and the human represented by [ɪa]), which is a car. By using the high and non-high vowel sequence, speakers are simply utilizing what is structurally basic/common to prosaic Akan in onomatopoeic word formation. In other words, native speakers very much capitalize on the basic structural principles of the language in these formations. As a result there is always this conflict between the need to capture sound quality and what, in reality,

¹⁷ It is interesting how two front vowels depict a small bird (i.e. a chicken) and the front-central sequence is used to depict something bigger than the first.

are structurally permissible sound combinations in a language, a challenge most often settled in favor of the former.

It must also be pointed out that certain physical characteristics of the sound emitting entity, and the event that created the sound the onomatopoeic word seeks to imitate, are quite often determinable from vowel usage. That is, the quality of vowels in usage are often icons of these features, and consequently aid in, or provide clues to, semantic interpretation with surrounding consonants usually providing details to such interpretations (which I hope to touch on partly here, and also, in the subsection on consonant usage in onomatopoeic ideophones). Vowels (excluding the low vowel) can be grouped into two sets on the basis of degree of amplitude (or volume). The sounds [i, ɪ, e, and ε] are often used when a sound is high-pitched – that is, making an association between the oral constriction associated with their production as front unrounded vowels, and the ‘smallness’ of an onomatopoeic sound and/or of the sound emitting entity. Their back rounded counterparts ([u, ʊ, o, ɔ]) are associated with loud emissions and perceptually big sound emitting entities – entities with big resonating chambers within or outside them. It is, therefore, not accidental that the back rounded vowels produced with bigger resonating chambers (basically, the oral chamber) compared to their front unrounded counterparts would be used in this case. Advanced tongue root vowels also allow for an increased pharyngeal chamber, which is why [u] features more than any other back/rounded vowel in onomatopoeic ideophones. Among front vowels, [i] is the most used because just like [u], [i] is advanced and allows for more space in the pharyngeal chamber/region where volume is concentrated (though factors such as the constriction of the oral cavity at the coronal – especially, the raising of the blade of the tongue toward the hard palate – and the type of consonant in use combine to impede airflow resulting in high pitch for [i] as opposed to [u]).

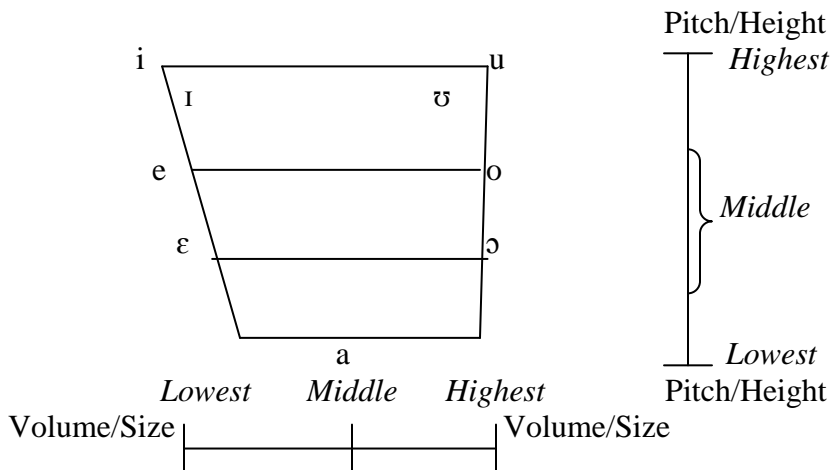
[a], the low central unadvanced vowel, together with [i] and [u], are the frequently used sounds. There is a lowering of the tongue and tongue root in the production of [a] which allows for more lung air to escape and to do so quickly. [a] is therefore the ideal sound for sharp emissions (i.e. emissions that dissipate quickly), which also entails that the contact that produces the sound with [a] must be quick (or instantaneous). Basically, the word ‘flapping’ with its several interpretations – namely, breaking, shaking, hitting, pounding, hammering, punching, vibrating, vacillating, quiver, flutter, hitting, jiggle/wiggle, splashing – covers much of the semantic range with onomatopoeic word forms with the non-high non-advanced vowels ([ε, ɔ, a]).

[e] and [o], the non-high advanced vowels, are employed, distinctively, in sounds of gunshot, explosion, cutting or the breaking of something, or sound emission from something metallic. Structures with [o] and [e] are uniquely either /CVV/ (with VV being identical) or /CVN/. Where the initial consonant is [b] and the final consonant is strictly [m], and the vowel between them is strictly an [o] (i.e. /bom/) as [e] never occurs in the neighborhood of either [b] or [m]. Initial consonant for CVV forms with either [oo] or [ee] is either a [p] or a [t] yielding forms such as *tee*, *pee*, *too*, *poo* (for explosions or gunshots), with *tee* representing a shot from a small gun or a not-loud explosion/deflation, followed by *pee* which with [p] is perceived to be coming from something bigger, and the sound a little bit louder, than *tee*. Between *too* and *poo* the latter is the loudest of the two from presumably a bigger gun or explosion compared to *too* (representing an entity and/or an explosion/gunshot smaller than *poo*). So forms with [o] are representative of something bigger and louder compared with forms with [e] made to capture something smaller and not so loud, thus

yielding the following hierarchy of size of entity and loudness with *poo* at the apex (i.e. as the biggest entity with the loudest sound) with *tee* at the bottom for something less: *poo* >> *too* >> *pee* >> *tee*. The fact that forms with [o] are perceived to be bigger in size and resonance than those with [e] supports an earlier claim on rounded/back vowels as symbolizing something huge, something that resonates immensely. From the above, the size of the sound emitting entity and volume are partly conveyed through the presence or absence of labiality: forms whose initial consonants are [+Labial] rank higher in size and in volume than those with non-labial initial consonants (i.e. [t]). In addition, these consonants are strictly voiceless and, again, are released plosively. Voicelessness allows for enough airflow into the pharyngeal chamber, which by then had already been enlarged from tongue root advancement. Finally, whether or not a vowel is rounded determines the loudness of an explosion or gunshot and the size of the sound emitting entity correlation often made.

Again, the following nasalized vowel sequence types are used to capture the sound of the horn of a vehicle: [õõ] >> [õõ] >> [ãã] >> [ĩĩ]. The order shows which horn is the biggest or has the most volume and also is the loudest. The native speakers I spoke with right away associated *põõ* with a big car (a truck) with a big horn with a big blast, and *pĩĩ* with a small car with a small horn that lacks volume and/or is high-pitched. Interestingly, the vowels in usage are unadvanced; the high rounded/back vowel (i.e. [õõ]) is the voluminous one and also the loudest. The mid rounded/back vowel sequence (i.e. [ãã]) is next in volume and loudness. So, from the back (from high to mid), we move to the central part of the tongue to have [ãã] (with less volume compared with õõ and õõ), and finally to [ĩĩ], the sound of a small and, therefore, a not so resonating car horn. In terms of pitch, forms with /a/ are the lowest, followed by /ε/ and /o/, followed by /e/ and /o/, followed by /ɪ/ and /ʊ/, and finally by /i/ and /u/.

(29) Sound: Volume vs. pitch (sound emitting entity: size vs. height)



The diagram above captures size and/or difference in sound volume. Volume is loudest/heaviest at the back, where vowels are rounded and sound emitting entities are (perceived as) big, followed by the central vowel, and finally, by front vowels. The diagram also captures pitch levels (or the length/height of sound emitting entities), with high vowels at the apex and the low vowel at the bottom. If anything, it is with this knowledge that speakers, partly, interpret and understand onomatopoeic forms.

2.2 Consonants and consonant distribution in onomatopoeic ideophones

On the table below is the list of consonants employed in the formation of onomatopoeic ideophones. There are twenty five of them; Dolphyne (1988: 29) lists close to 30 consonant sounds in prosaic (i.e. non-ideophonic) Akan (Twi).

(30) Consonant sounds

	Bilabial	Labio-dental	Alveolar	Alveolo-palatal	Labio-alveolo-palatal	Palatal	Velar	Labio-velar	Glottal
Plosive	p b		t d				k g	kw gb	
Fricative		f v	s sw[sɥ]	ɕ					h hw
Affricate				te	teɥ dzɥ				
Nasal	m				ɲɥ	ɲ	ŋ		
Trill			r						
Glide						j		w	

The sounds [v] and [gb] are non-existent in prosaic Akan (Twi) and yet feature in onomatopoeic forms. This leaves us with twenty three of the close to thirty consonant sounds in prosaic Akan (Twi) for onomatopoeic forms. The following prosaic consonant sounds, /l, si [sy], nw [ɲw], hu, su, n, gu/ (Dolphyne, 1988: 29), are missing from the table.¹⁸ The ensuing paragraphs concentrate on consonant distribution and semantic import in sound creation and sound structure.

2.2.1 Defining onomatopoeic ideophones' initial consonants (#C₁V...)

The focus here is on the distribution of consonants word-initially in onomatopoeic words. Consonants have been grouped according to manner, namely plosives, fricatives, affricates, roll/trill(s), nasals, and glides.

¹⁸ It is possible that the so-called missing sounds are either never used at all, or are modified into a known or a completely foreign sound in the process. The status of these consonants in prosaic Akan probably explains why they are omitted: /l/ is not basic in Akan (Twi) – natively, it is in free variation with /r/ in most contexts, even in borrowed words where /l/ is basic to the source language; [si] is on the list because I wouldn't analyze it as a single sound in the expressive [sisisisi]; [ɲw] should probably be dropped from the list because of [Nwaa(Nwaa)] 'expressive of a wood-cutting machine,' again, [hu] is on the list because I am not ready to consider it a single sound as in [huhuhuhu]. In prosaic Akan, hw [ɕɥ] is basically an allophone of [hu] before front vowels, [ɕɥ], therefore, makes up for the absence of hu; sw [sɥ] before front vowel(s) in onomatopoeic forms is possibly [su] in prosaic Twi; [n] does 'not' occur in onomatopoeic ideophones, probably because there is a preference for its velar counterpart (i.e. [ŋ]) (in Akuapem) or nasalized high vowels (i.e. [ĩ, ỹ, ũ, õ]) (in Asante and Akyem) at the onomatopoeic word final position; and [gb] is probably /kw/ modified.

(31)

	Plosives								Fricatives							Affricates			Roll	Nasals				Glides	
	p	b	t	d	k	g	kw	gb	f	v	s	ɛ	sq	hw	h	tɛ	tɛɥ	dzɥ	r	m	ɲ	ɲɥ	ŋ	j	w
i	+	+	+	+	+	+	+	-	+	-	+	-	-	+	+	+	-	-	-	-	-	-	-	-	-
u	+	+	+	+	+	+	-	-	+	+	-	-	-	-	+	-	+	-	-	+	-	-	-	-	-
ɪ	+	+	+	-	+	-	+	-	+	-	-	+	+	-	+	+	+	-	-	+	-	+	-	-	-
ʊ	+	-	-	-	+	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
e	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o	+	-	+	-	+	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+
ɛ	+	+	+	-	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-
ɔ	+	+	+	-	+	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-
a	+	+	+	-	+	-	+	+	+	-	+	-	-	-	+	+	+	+	-	+	-	-	-	-	+

The following rankings show which manner sounds are commonly used as C_1 – (a) from the group with the most members to the group with the least or no members, namely plosives (8 sounds) >> fricatives (7 sounds) >> Nasals (4 sounds) >> Affricates (3 sounds) >> Glide (2 sounds) >> *Roll/trill; and (b) from the most used to the least used manner group of sounds, namely, plosives (41 cases as C_1) >> Fricatives (19 cases as C_1) >> Affricates (7 cases as C_1) >> Nasals (6 cases as C_1) >> Glides (3 cases as C_1). Now, some comments on the last ranking (i.e. b): [r] never features at onomatopoeic word initial position – such is the case in prosaic Akan (Twi) words. Of the two glides ([w] and [j]), [w] does not occur before high vowels (i, ɪ, u, ʊ), front vowels (i, ɪ, e, ɛ), and non-low unadvanced vowels (ɪ, ʊ, ɛ, ɔ), and the sole distribution of [j] is before [ɔ]. On nasal consonants ([m, ɲ, ɲɥ, ŋ]), the nasal [ɲ] is never used at onomatopoeic word initial; [ɲɥ] and [ŋ] are but one time each. [ɲɥ] can be considered /nw/, but then palatalized before a front high vowel. The occurrence of [ŋ] at onomatopoeic word initial is one of the impossibilities in prosaic Akan (Twi) – if [ŋ] does occur at prosaic word initial, it is homorganic. Also, [ŋ] is more frequent than [ɲ] in onomatopoeic word creation. [m] is the most used nasal sound featuring before [u] (for cattle), [a] (for humans), [ɛ] (for goats/sheep), and [ɪ] (for cats). If we bring [ŋ] in [ŋɛɛ] ‘expressive of the cry of a baby’ into the picture, ideophones beginning with a nasal consonant (with the exception of [ɲɥɪ] for a drizzle) are [+Animate]. It is also interesting to note how size, to some extent, conditions vowel selection after these nasals (i.e. [m] and [ŋ]) – the cattle being the biggest in size of the three gets [u] after [m], human beings have either [a] or [ɛ] to choose from (for technically being the next big entity), and goats and sheep get [ɛ] like human babies. Of the three, the cat has the least size, and so gets [ɪ]. A drizzle is also not considered anything heavy and gets [ɪ] as well. As a reminder, vowels have to be long with an initial nasal consonant. On affricates (tɛ, tɛɥ and dzɥ), they cannot occur before mid vowels [e, ɛ, ɔ, o] and [ʊ]; all three precede [a] (i.e. *teawteaw* ‘walking on dry leaves’; *tɛɥàà* ‘sound of water pouring down’; *dzɥàà* ‘sound of water pouring down intensely’). Both [tɛ] and [tɛɥ] occur before [ɪ], but are also in complementary distribution, with [tɛ] occurring before [i] (where it is in free variation with [j]), and [tɛɥ] occurring before [u]. [tɛɥ] and [u] sequence (in the ideophone, [tɛɥuo]) is, again, a unique feature of onomatopoeic ideophones – the sequence is never possible in prosaic Akan (Twi). For fricatives [f, v, s, ɛ, sq, ɛw, h], the most used fricatives as C_1 are [f] and [h] – neither of the two consonants occur before [e],

and only [f] occurs before [ɛ]. Otherwise, they both precede every vowel. [s] is used twice (e.g. *sisisisi* and *sam*) and [ʃ], [ɛw], [sq], and [v] one time each. For plosives [p, b, t, d, k, g, kw, gb], [p] and [k] appear as C₁ before every vowel. [t] cannot appear before [ɪ], otherwise it appears before every vowel – if *tɔrɔm* ‘manner of escape’ can be considered onomatopoeic then [t] just like [p] and [k] appears before every vowel, The next most used plosive is voiced, [b]. The only vowels [b] cannot precede are [ɪ, e, o]. [kw] comes after [b] in being the next most used consonant. With the exception of [ɛ], [kw] mainly occurs before non-back/non-round vowels. [d] and [g] appear before [i] and [u] only, and [gb], only before [a].¹⁹ From what we have seen so far, voiced (plosive/fricative/affricate) consonants are the least used in onomatopoeic ideophones as the rankings below have them.

(32)

		Rankings
[-sonorant]	plosives	p, k >> t >> b >> kw >> d, g >> gb
	fricatives	f, h >> s >> v, ɛ, sq, hw
	affricates	tɛ, tɛɣ >> dzɣ
[+sonorant]	nasals	m >> nɣ, ŋ
	glides	w >> j

Also, where we have a voiceless vs. voiced pair, the voiceless is used as C₁ more than its voiced counterpart. A case in point is [p] and [b], with [b] occurring even more than most voiceless consonants, but not [p], its (voiceless) counterpart, as C₁. The same is true for [t] and [d], [k] and [g], [kw] and [gb], [f] and [v], and [tɛɣ] and [dzɣ]. In the ensuing discussion, I go to the extent of treating non-sonorant C₁s as underlyingly voiceless and establish the predictable circumstances under which their voiced non-sonorant counterparts emerge (or are preferred), which means, should the proposal stand, sonorants will emerge as the only/true voiced C₁s in onomatopoeic Akan (Twi).

Voiced non-sonorants as C₁ are restricted to the following onomatopoeic word domains: #_V(V)C_[+Nasal] (i.e. 33a, 33b, and 34) or #__VV# (33c). Semantically, onomatopoeic forms beginning with voiced non-sonorants come with ‘vibration’ (or what can also be described as intensity at its highest) – technically/perceptually, a shaking of the sound emitting entity felt through sound emission. Vibration/intensity, as a component of an emission in forms in column B, is perceived and expressed as vibrating glottis and is how forms (B) are different from those in column (A). Vibration manifests on C₁ in (B).

(33)

(a)	Column (A): C _{1[-voice]}	Column (B): C _{1[+voice]}
(i)	tim	dim ‘a fist hit at the back of someone’
(ii)	tum	dum ‘a fist hit at the back of someone’
(b)	C ₁ (Non-vibrating)	C ₁ (Vibrating)
(i)	kim	gim ‘heavy footsteps or hitting’
(ii)	kum	gum ‘pounding with fist or hammering’
(c)	tɛɣaa	dzɣaa ‘sound of water pouring down’

¹⁹ I have heard *gway* as an alternative to *gbay*.

I have used the term ‘alternant’ to describe the pairs for the following reasons: first, the semantic distinction between each pair, which is basically in the force with which each was delivered, is not big enough difference to consider them separate onomatopoeic forms/words as they are often interchanged in meaning; and second, we can predict when and which consonants vibrate to register intensity – basically, /t/, /k/, and /tɕ/ do.²⁰ Having said this, forms in column (A) are basic and their counterparts in (B) always derived to capture a secondary onomatopoeic sound feature, which in this case is vibration. In the ensuing examples, however, vibration in C₁ is phonologically-conditioned – the requirement being that if C₁ agrees with its final-C_[+nasal] in place of articulation then C₁ must as well agree with its final-C_[+nasal] in [voice].

(34)

(a) Underlying	Surface	Near English Gloss
(i) /pim/	[bim]	‘the sound beating or striking (usually at the back)’
(ii) /pum/	[bum]	‘expressive of a door knock’
(iii) /pom/	[bom]	‘sound of the fire of lantern going out’
(iv) /pem/	[*bem]	
(v) /pɛm/	[bɛm]	‘expressive of manner in which one was hit or fell’
(vi) /pɔm/	[bɔm]	‘sound of someone falling; or expressive of walking’
(vii) /pam/	[bam]	‘striking/clapping/lashing/falling’

(b) Underlying	Surface	Near English Gloss
/kwaŋ/	[gbaŋ]	‘a collision’

So, initial underlying /p/ (i.e. 34a, column/co. 1), just like final /m/, is [+labial] which is why [b] is preferred phonetically. In (34b, column/co. 1), the initial non-sonorant consonant, which I propose to be [kw], just like [ŋ], is [+velar], though [kw] secondarily is [+labial], which is why the [kw] change does not go to *[g] but goes to [gb] (a foreign sound). This is an attempt to preserve (the two) place features (labial and velar) in the face of voiced harmony triggered by /ŋ/. [p] and [kw] together are voiceless labial plosives and change to voiced labial plosives. What this means semantically is that onomatopoeic sounds ending in nasal [m] or [ŋ], with a non-sonorant C₁ that harmonizes with the nasal in place, can only be voiced. To say the underlying forms in (36, column/co. 1) will be a violation of this important constraint, hence the change to forms in (36, column/co. 2). Equally interesting is how the effects of (33) and (34) (i.e. lexically-conditioned and phonologically-conditioned vibration) merge in the creation of the onomatopoeic ideophone, *vuum* ‘the noise of a car engine’. The proposal is that *vũũm* is underlyingly /fũũm/ (as the /v/ sound is foreign). Socio-culturally, vibration is an indispensable part of the structure of sound from a car engine, hence [vuum]. Another reason which is not strong enough is the fact that /f/, just like /m/, is [+labial]. The change from /f/ to [v], with this position, is phonologically conditioned, i.e. the condition which says that if the two consonants agree in labiality, they must also agree in voice applies. What this means is that onomatopoeic ideophones are underlyingly either sonorant ([-liquid]) initial or voiceless non-sonorant initial in Akan (Twi); voiced non-

²⁰ That is, voiceless non-labial plosives before high advanced vowels and the voiceless labio-alveolo-palatal affricate before the low vowel.

sonorants are contextually predictable. Voiced non-sonorant C₁s are derived – either grammatically (i.e. to be able to capture a secondary sound component) or phonologically and grammatically. Meeting these requirements is so significant even if it leads to using foreign sound segments, i.e. even sounds outside the scope of acceptable sound units of the language (e.g. [v] and [gb]).

2.2.2 Defining C₂ selection in basic (CVC and CVCV) onomatopoeic forms

From (2.2.1) glottal vibration in non-sonorous C₁ consonants is predictably semantic. This position can be generalized over every positional distribution of voiced non-sonorous consonants (including the current one). Following, therefore, is a reconstruction of voiced non-sonorant consonant phones at two word positions, as C₁ and C₂, back to their voiceless non-sonorant phonemes. The conversion is phonologically necessary since sound intensity, which glottal vibration is made to capture, is contextually predictable (i.e. is obvious during sound emission, and hence can be captured easily). The table also ranks C₂ selection for each C₁ from the most to the least preferred C₂. Column (1) of the table is purely phonetic on C₁ vs. C₂ information. In column (2) is where voiced C₁, and C₂ consonants are reconstructed back to their voiceless counterparts. Column 3 is our final (most-to-least-preferred) phonemic ranking of C₂ consonant selection (i.e. after voiced non-sonorants have phonemically been changed to voiceless in column 2).

(35)

Column 1: Phonetic		Column 2: Phonemic		Column 3: Phonemic Result	
C ₁	Ranked C ₂ selection	C ₁	Ranked C ₂ selection	C ₁	Ranked C ₂ Selection
p	p/7>ŋ/4>t/3>m/r(2)>h/b/k(1)	p	p/7>ŋ/4>t/3>m/r(2)>h/p/k(1)	p	p/10>>m/8>>r/5>>ŋ/4>>t/3>>h, k (1)
b	m/6>r/3>b/2	p	m/6>r/3>p/2		
t	ŋ(4)>m/t(3)>w/r(1)	t	ŋ/4>m/t(3)>w/r(1)	t	m/5>>ŋ/4>>t/3>>w/r(1)
d	m (2)	t	m/2		
k	k(10)>ŋ(4)>m/r(2)>p/t/h(1)	k	k/10>ŋ/4>m/r(2)>p/t/h(1)	k	k/11>>ŋ/4>>m/3>>r/t(2)>>p/h(1)
g	m, d, g (1)	k	/m/t/k (1)		
kw	kw(2)	kw	kw/2	kw	kw/2>>ŋ/1
gb	ŋ(1)	kw	ŋ/1		
f	m/4>ŋ/ky/f(1)	f	m/4>ŋ/ky/f(1)	f	m/5>ŋ/ky/f(1)
v	m/1	f	m/1		
s	m(2)>w/s(1)	s	m/2>w/s(1)	s	m/2>w/s(1)
ε	w(1)	ε	w/1	ε	w/1
h	m/ŋ/n(1)	h	m/ŋ/n(1)	h	m/ŋ/n(1)
hw	m(1)	hw	m/1	hw	m/1
te	r/w(2)>>m(1)	te	r/w(2)>>m(1)	t	r/w(2)>>m/1
j	m/1	j	m/1	j	m/1
w	r/m/ŋ(1)	w	r/m/ŋ(1)	w	r/m/ŋ(1)

Out of 19 phonemes employed in onomatopoeic ideophonic formation (namely, /p/ ([p, b]), /t/ ([t, d]), /k/ ([k, g]), /kw/ ([kw, gb]), /f/ ([f, v]), /s/, /sw/, /ε/, /h/, /hw/, /tε/, /tεq/ ([tεq, dzεq]), /m/, /ŋq/, /ŋ/, /r/, /j/, /w/), twelve (namely, /p/ ([p, b]), /t/ ([t, d]), /k/ ([k, g]), /kw/ ([kw, gb]), /f/ ([f, v]), /s/, /ε/, /h/, /hw/, /tε/, /j/, /w/) select a consonant after an initial vowel in what is either a /CVC/ or /CVCV/ basic onomatopoeic word structure. Nasal consonants and most affricates do not select C₂ (or cannot be followed by any sound, [+Consonantal]). The requirement is that these consonants (especially nasal consonants) be followed by two (or more) vowels (identical and/or non-identical vowels).

Table (36) provides a neat summary of C₂ selection, that is, which C₁ cooccurs with which C₂. Numbers on each row represent how many times a consonant occurs as C₂ for a C₁ consonant at the leftmost column of the table. For example, /p/ ([p, b]) frequently selects itself (10 times) as C₂ (mostly as a result of CV onomatopoeic duplication), the next most selected C₂ is /m/ (8 cases), followed by /ŋ/ (4 cases), etc. The rightmost column of the table shows which C₁ selects most C₂s (from top-down) from the most C₂ selecting C₁ to the least C₂ selecting C₁. For example, the voiceless plosives (/p, k, t/) select the most C₂s. We also know from (2.1.1) that they are the most used C₁.

(36)

C ₁ - phonemic ↓	C ₂ Selection: Type of C ₂														C ₁ with the most C ₂ ↓
	m	ŋ	k	r	p	t	w	kw	h	f	s	tε	ŋ	j, ε, εw, tεq	
p	8	4	1	5	10	3			1						32
k	3	4	11	2	1	2			1						24
t	5	4		1		3	1								14
f	5	1								1		1			8
tε	1			2			2								5
s	2						1				1				4
h	1	1				1							1		4
kw		1						2							3
w	1	1		1											3
ε							1								1
hw	1														1
j	1														1
Most used C ₂ →	28	16	12	11	11	9	5	2	2	1	1	1	1	0	

The last row of the table shows how many times a consonant is used as C₂ from the most used C₂ to the least used C₂ (i.e. from left-to-right on that row). The order of ranking is: /m/ (28 cases) >> /ŋ/ (16 cases) >> /k/ (12) >> /r, p/ (11 cases each) >> /t/ (9) >> w (5) >> kw, h (2 cases each) >> /f, s, tε, ŋ/ (one case each), with /m/ as the most used C₂ and /f, s, tε, ŋ/ as the least used C₂s. The nasals /m/ and /ŋ/ as C₂ are always word final (prior to reduplication). In more inclusive terms, non-palatal sonorants, voiceless plosives, and back consonants are the most used C₂ in that order (with some overlap – for example /k/ is used more than /r/, and /r/ more than /p/; their difference is insignificant, numerically). The sounds /j, ε, εw, tεq/ are never used as C₂ in a /CVC/ or /CVCV/ onomatopoeic structure. Plosives, basically, select

either non-palatal nasals, the trill, or usually themselves or other plosives as C₂; they do not select affricates as C₂, and the only fricative selected as C₂ is /h/. Of the three basic plosives (i.e. /p, t, k/), /t/ is least selected as either a C₁ or a C₂. /t/ does not select /p/, /k/, /kw/, fricatives, or affricates as C₂; it only selects /m, ŋ, r/ (i.e. sonorants) as C₂. /p/ and /k/ pattern in selecting the same types of and close to the same number of C₂. Their only difference is that each selects itself more as C₂ than it selects the other. /kw/ is basically followed by a sequence of two identical vowels not selecting any consonant as C₂ except for itself under reduplication. C₁ fricatives (/f, s, ɛ, h, hw/) do not select plosives as C₂. Only /h/ (C₁) selects /t/ as C₂ and does not select fricatives as C₂ except under reduplication (e.g. *sisisisi* ‘noise made by some insects’). They basically select sonorants for C₂ (/m/ being the most preferred C₂ before /ŋ/). C₁ affricates do not select plosives and fricatives as C₂; their selection of affricates (i.e. themselves) and nasals as C₂ is very limited (selecting a C₂ affricate is possible under reduplication). They basically select long vowels or /r/ and /w/ (with /tɛ/ functioning as C₁). The data I worked with did not show [dz] as C₁ or C₂. Glides (/j, w/) do not select plosives, fricatives, and affricates as C₂. They mainly select non-palatal sonorants (i.e. /m, w, ŋ, r/) as C₂.

3.0 Reduplicated ideophones in Akan – A morphophonological outlook

Reduplication, which Crystal (1992:329) describes as “various types of repetition in the structure of a word”, and Kenstowicz (1994) as “one of the morphological operations which takes into account the phonology of the base”, is generally regarded as one of the major distinguishing properties of ideophones (Beck 2008: 5). Other claims are that “... ideophones are highly distinctive, sharing a set of traits that they do not share to any large extent with any other group of words ... [and] ... that the most reliable and consistent way of identifying ideophones is by making recourse to their phonological and morphological properties” (Alpher, 1994; Childs, 1994; Voeltz & Kilian-Hatz, 2001). This section investigates the veracity of these claims based on the question: how are reduplicated ideophones, morphophonologically, different than, or similar to, other forms of reduplication, namely verb, adjective, noun, and, adverb reduplication, in Akan? It is now obvious that onomatopoeic ideophones in Akan are mostly reduplicative, meaning there is a degree of vocal correspondence between some two or more functional entities within each reduplicated unit/piece. Vocal correspondence (between the units in reduplication) here is simply a mimicking of physical/real-world correspondence (between two or more sound sequences/events). The two or more functional entities in physical, and for that reason vocal, correspondence could be conceived as minimally dependent or independent sound events carefully strung together to achieve some communicative effect. As we are about to see, the uniqueness of reduplicated onomatopoeic forms lies with the fact that morphophonological wellformedness is constantly sacrificed where the need to accurately capture each of the sound events within a reduplicated piece is so crucial. From what we have said, terms such as ‘base’ and ‘reduplicant’ do not accurately capture the formal relation that exists between contents of reduplicated onomatopoeic ideophones as correspondence is vertical (i.e. each vocal unit has its own independent physical/real-world/sound-event correlate) rather than horizontal (i.e. latter emissions, therefore, cannot be photocopies of an earlier emission in a reduplicated piece). The following discussion focuses on four types of basic onomatopoeic word reduplication, namely CV (in 37), CVV (38 and 39), CVC (40 and 41), and CVCV

(42), focusing very much on how the first three categories reduplicate similar to, or different than, prosaic forms.

Non-High dissimilation, which is the norm in CV verb reduplication, fails to apply in vowels of reduplicated CV onomatopoeic forms (hence the illicitness of (37b/ii) and (37c/ii) below).²¹ By violating the non-high dissimilation rule, CV onomatopoeic duplication is behaving just like CV adjectival and adverbial reduplication.

(37)	<u>Basic Form</u>	<u>Reduplicated</u>	<u>Near English Gloss</u>
(a)	pi	pipi	‘sound of a car horn’
(b)	pá	(i) pápá ~ (ii) *pĩpã	‘noise of a car horn’
(c)	pɛ	(i) pɛpɛ ~ (ii) *pĩpɛ	‘the cutting of a cloth or hair with scissors’

(38)	<u>Basic Form</u>	<u>Reduplicated</u>	<u>Near English Gloss</u>
(a)	jɔɔ	jɔɔjɔɔ	‘footsteps of a crowd – many of the same’
(b)	hwii	hwiihwii	‘noise of a fleet of cars’
(c)	ɲɲɲ	ɲɲɲɲɲɲ	‘drizzle intermittently’
(d)	tɛɣaa	tɛɣaatɛɣaa	‘the cry of fowls’

Vowel qualities of CVV basic forms in (38) remain the same in reduplication just like (37). Phonologically, basic CVV and their reduplicated CVVCVV forms look more like descriptive/manner verbs (or like adverbs) than adjectives.²²

The verb *dǎŋ* ‘to depend on’ in Akuapem dialect is realized as either *dàni* or *dǎŋ* (with the same meaning) in Asante and Akyem dialects of Akan. In reduplication, *dǎŋ* becomes either *dǎǎdǎŋ* or *dǎǎdǎǎ*, and not **dǎŋdǎŋ*. That is, the [aɪ] vowel sequence becomes [aa] (optionally or obligatorily depending on the domain). This is not the case in onomatopoeic word duplication, as shown in (39/ii/iii) below, the [aɪ] sequence remains [aɪ] in the duplicated onomatopoeic word.

²¹ Non-High dissimilation in CV verbs holds in the reduplicant (prefix) when the base vowel is non-high – it is in principle an avoidance of a non-high vowel (Prince & McCarthy, 1995; Kager, 1999) in underlyingly monosyllabic reduplicants (Ofori, Ms). For example, the verb *ti* ‘pluck’ reduplicates to [titi], but the verb *da* ‘sleep’ rather reduplicates to *[dida] and not [dada].

²² There are verb forms like *taa* ‘chase’ becoming *taataa*; **daa* realized as *daadaa* ‘to deceive’; *tɪtɪ* ‘to worry someone.’ Syntactically, forms in (38) are adverbial just like any onomatopoeic ideophone, as illustrated with the sound *tɛɣaatɛɣaa* (in 38d): *Nnomaa no resu tɛɣaatɛɣaa* ‘The birds are ‘crying’ *tɛɣaatɛɣaa*.’ The onomatopoeic form follows the VP and is necessary because the verb *su* ‘cry’ is not specific enough because of its usage for anything animate – animals, human, etc. The onomatopoeic word, which is a description of the sound concerned, is used, therefore, to narrow down the range of possible uses of the word cry to the cry of the birds concerned. It narrows down the scope of reference of the word cry from simply animate to birds, and from birds to a bird type, and by this, is inherently a determiner/specifier like every onomatopoeic word. That is, sound emissions are verbalized for specificity encoding – i.e. to capture the how, the result, the who and/or what, etc. of an event that are mainly and/or specifically determinable from sound emissions. By this, onomatopoeic ideophones are functionally a little over pure adverbs in the sense that an onomatopoeic ideophone can qualify almost every major constituent of the event that produced it (even the subject of the sentence and not simply the VP).

(39)	Basic Form	Reduplicated	Near English Gloss
(a)	/waŋ/ ~ [wãĩ]	(i) wãĩwãĩ ~ (ii) *wããwãĩ ~ (iii) *wããwãã	‘hitting’ (from waŋ)
(b)	/paŋ/ ~ [pãĩ]	(i) pãĩpãĩ ~ (ii) *pããpãĩ ~ (iii) *pããpãã	‘a bell; a collision; hitting’
(c)	/kãĩ/	(i) kãĩ(kãĩ) ~ (ii) *kaãkãĩ ~ (iii) *kããkãã	‘hitting an iron bell’

In (40), we have [Cow] and [Coo] basic/reduplicated form alternation, that is, the alternation is not due to reduplication per se. By proposing /Cow/ as basic, we can express this as [w] deletion followed by compensatory /o/ lengthening. Alternatively, and more preferably, (i) and (ii) can be viewed as two different ways of capturing the same sound, with [w] functioning as a delimiter in (i), as opposed to a final [o] in (ii), which is non-delimiting and can be extended indefinitely.

(40)	Basic Form	Reduplicated	Near English Gloss
(a)	pow ~ poo	(i) powpow ~ (ii) poopoo	‘two gunshot’
(b)	tow ~ too	(i) towtow ~ (ii) tootoo	‘two gunshot’

The data in (41), just like (39), set onomatopoeic ideophones apart from all other forms of reduplication. A key characteristic of prosaic reduplication is the fact that a morpheme boundary nasal (or a reduplicant final nasal) harmonizes with a following non-nasal consonant (i.e. base initial non-nasal consonant) in place.

(41)	Basic Form	Reduplicated	Near English Gloss
(a)	ham	(i) hamham ~ (ii) *haŋham	‘gallop food down the throat’
(b)	tum	(i) tumtum ~ (ii) *tuntum	‘pounding of fufu, a meal’
(c)	tim	(i) timtim ~ (ii) *tintim	‘fruits falling down from a tree’
(d)	bam	(i) bambam ~ (ii) *bammam	‘several hits’
(e)	taŋ	(i) taŋtaŋ ~ (ii) *tantaŋ	‘two slaps’

This rule applies in verbal, nominal, adjective, and adverbial reduplications, but not in ideophones (specifically, onomatopoeic ideophones), and explains why forms in (41a-b, ii) are illicit. That is, onomatopoeic reduplicated forms oppose prosaic reduplicated forms in the requirement that morpheme final nasals retain their place feature (and morpheme initial consonants, their manner, e.g. 41d/ii **bammam**) at morpheme boundary.

Forms in (42) are inherently reduplicative. They only make sense in their CVCVCVCV structure; their CVCV forms cannot exist with meaning.²³

²³ I expressed earlier on that *kyiekya* is *kyia* reduplicated and also indicated that vowel harmony was in application here. These positions could be wrong as *kyia* is not independently meaningful. It is more plausible to argue that *kyie* and *kyia* capture two different footsteps just the way *kuro* and *kyia* combined into *kuroteia*,

(42)	Basic Form	Reduplicated	Near English Gloss
	(a) *gidi	gidgidi	‘jump/run around energetically/forcefully’
	(b) *hɔŋɔ	hɔŋɔhɔŋɔ	‘the buzzing of bees’
	(c) *pupo	pupopupo	‘two people hitting one another in a fight’
	(d) *putu	putuputu	‘the sound of drumming repeatedly’
	(e) *baba	babababa	‘sound of running (usually barefooted)’
	(f) *tutu	tutututu	‘the sound of boiling water’

Table (43) provides a summary of how the categories, verbs (vb), adjectives (Adj.), nouns (N.), adverbs (Adv.) and onomatopoeic ideophones perform against each other on some morphophonological/reduplicative processes some of which we have discussed in this paper (see Ofori, 2006 for a very detailed analysis on some of these processes). (The sign ‘✓’ means ‘applicable’; blank means ‘not applicable’.)

(43)

Processes	Vb.	Adj.	N.	Adv.	Onomatopoeic Ideophones
(a) Dissimilation (i.e. *[-high], monosyllabic reduplicant)	✓				
(b) /a/ lengthens to compensate for [rɪ] loss	✓	✓	✓	✓	
(c) /ar ⁺ / or /ɛɪ/ becomes [aa] or [ɛɛ] at morpheme boundary	✓		✓		
(d) Vowel shortening for the reduplicant		✓		✓	
(e) Homorganicity	✓	✓	✓	✓	
(f) Nasalization of morpheme init. voiced cons. after a nasal	✓	✓	✓	✓	
(g) Consonant shortening – a long final consonant		✓		✓	

From the table, onomatopoeic ideophones uniquely do not observe any of these vowel/consonantal processes. The goal is to vividly capture sound emissions. Each sound segment is therefore carefully selected to achieve this goal and cannot be altered once selected. Any attempt at altering the qualities of a sound segment, therefore, will not give us an accurate voice picture/representation of sound emission, i.e. we will be capturing something else and not the particular sound emission whose sound segment has been altered. The fact that we are even willing to go beyond the permissible sound inventory and sequences of the language shows how important the need is to adequately capture sound emission by voice, and why these morphophonological conditions, most of which just apply to ease articulation, are flouted.

also, ‘manner of walking’ do. The requirement in both *kyiekya* and *kurotea* is that the vowels of the first part are [+ATR] (i.e. *kyie* and *kuro*) and that the second part makes the /ia/ combination (i.e. *kyia* and *tea*).

4. Conclusion

Often created on the spur of the moment, onomatopoeic ideophones represent the human ability to go beyond LANGUAGE as a normative picture of human (group) experiences and reflect the following: (a) how limited language as a social contract is to adequately capture group experiences; (b) the extent of our linguistic ability to turn and twist the (little) available to achieve our communicative ends, and the fact that we go to the extent of breaking the norm (which, by the way, is done minimally) by using socio-culturally non-conventionalized sounds and sound combinations, and (c) is a reflection of how our linguistic ability surpasses language per se, and why language, as a normative vocal camera for group experiences, is always under attack to change. In other words, human ability (e.g. linguistic ability) surpasses the norm (e.g. language) and constantly breaks the norm. To the African, especially the Akan (Twi) speaker, onomatopoeic words are as important as prosaic words in speech. They are a product of our linguistic ability as native speakers of Akan, just like prosaic forms, and for that reason cannot be overlooked in our quest to fully describe the adult Akan speaker’s linguistic (i.e. morphophonological) knowledge.

It has been established that all ten oral vowel sounds are employed somehow in onomatopoeic words. /a/, /u/, and /i/ are the most used of these vowel sounds, followed by /ɪ/, followed by /ɔ/ and /ɛ/, and lastly by /o/ >> /ʊ/ >> /e/ in that order (see, section 2). With the exception of non-palatal sonorants, consonants (i.e. non-sonorant consonants) in onomatopoeic forms are underlyingly voiceless – a voiceless non-sonorant consonant may only become voiced to encode a vibrating/shaking effect that comes with an emission. Underlyingly, voiceless and sonorant consonants employed in onomatopoeic words form a neat pattern based on frequency of usage as shown below (the trill [r] and affricates /tʃ, tʃʰ/ are left out for being concentrated in the middle only):

(44)

	A: Front (lip involved)	B: Middle (alveolar - palatal)	C: Back (velar and after)
Plosives	/p/	/t/	/k/, /kw/
Fricatives	/f/	/s, ɕ, sw/	/h/, /hw/
Nasals	/m/	/ɲ, ɲʰ/	/ŋ/
Glides	—	/j/	/w/

Sounds designated as front under (A) are the most used sounds, followed by back consonants (basically, /k, h, ŋ, w/), followed lastly by sounds designated as middle under (B). Overall, plosives are the most used sounds, followed by nasals, followed by fricatives, etc. As C₁, plosives are the most used, followed by fricatives, affricates, nasals, glides, in that order; and as C₂, (non-palatal) nasals, voiceless plosives and plain back consonants are the most used. What is interesting about sound usage is the fact that /i, u, a/, and voiceless consonants (especially, /p, t, k/) are often the unmarked sounds in most languages (Rice, 2007), and also the most used sounds in onomatopoeic Akan (Twi). /ɪ/ is the default vowel in Akan, so it is understandable how it is the next most used vowel after /i, u, a/. Mid rounded vowels are used more than their non-rounded counterparts, and mid non-ATR vowels are used more than mid [+ATR] vowels. Vowel sequences (with or without a consonant intervening the sequence) are either identical, or non-identical; the most preferred

non-identical vowel sequence being a high vowel followed by a non-high vowel, which is the most common/basic vowel sequence in prosaic Akan (Twi).

If an onomatopoeic word has any meaning, it is in an event context, i.e. a syntactic/discourse/socio-cultural context. If the goal in their creation and usage in communication is to attain semantic specificity then it is required that an onomatopoeic author has, at least, basic knowledge of possible sound emissions in a socio-cultural context, as well as basic knowledge of their near vocal correlates/icons in the given socio-cultural domain, in order to be able to construct sound emissions acceptably, and also meaningfully. It is in such linguistic and socio-cultural knowledge contexts that onomatopoeic words are formed across languages, are unique to those languages, and, largely, are only semantically determinate in the socio-cultural contexts that speak such languages. In the Akan socio-cultural and linguistic context, these sounds are selected for what they literally are to native speakers (i.e. based on how they are perceived by native speakers): a plosive is selected for an explosion or a sudden non-fricative sound emission, a fricative for a fricated emission, an affricate for a delayed fricated emission, a nasal consonant for nasal plosion, etc. Voicing in consonants denotes intensity, or a shaking of the affected, in the course of sound emission. When it comes to vowels, back/rounded vowels represent big size and sound volume, and front vowels, small size and sound volume after /a/. In the case of consonants, sounds with [+Labial] initial (i.e. sounds designated as front above) are perceived bigger, followed by sound designated as back, and finally followed by sounds described as middle. On tone: Tone connotes the rapidity of event (or contact), and for that reason, sound emission. Fast/quick contact/event results in fast emission and a high tone, and slow contact/event, slow emission and consequently, a low tone; tone is onomatopoeically contrastive (see: 20f). As was described earlier, the segments/units that combine to form an onomatopoeic ideophone are taken for what they are, which is why a sound cannot be altered in any form once selected, and why reduplicated ideophones, as we observed in section (3), flout every basic morphophonological process. To capture sound emissions vividly comes with some cost, which comes in the form of either violating well-known basic processes, or placing sounds at odd places (e.g. /ŋ/ at word initial before a vowel), or employing foreign sounds (e.g. [v], [gb]), all in the name of achieving near voice vs. sound emission correspondence. Underlyingly, native speakers of Akan utilize the permissible sound inventory and structure of their language in onomatopoeic formations. The chief reason onomatopoeic forms look different in form than prosaic forms, therefore, is that we operate in a context whereby the correspondence relation between voice and sound emission is supreme, conditions sound selection and combination, and, basically, blocks certain basic morphophonological processes that threaten correspondence, and for that matter, semantic determinacy.

I remember someone asking about how the African/Akan child comes to achieve such an extraordinary linguistic feat in one of my presentations, and following was my answer; As an African and a native speaker of an African language there is nothing extraordinary about being able to create and/or use onomatopoeic ideophones for it has been a part of my entire linguistic exposure or experience. Honestly, I do not subscribe to any position to the effect that the ability and skill to do this is extraordinarily unique to the African/Akan (child) for the very act of learning to speak (a) language launches everyone (irrespective of their geographical location, language, and/or culture) into this territory of sound imitation. Don't we emit sounds when we speak (a language)? If speaking entails sound emission, is the act of learning to speak that language, not in part, a near imitation of such sound emissions, this

time, vocal/speech emissions? In creating onomatopoeic forms, we simply are utilizing the same basic human ability and skill, but in the context of largely non-vocal emissions and in a socio-cultural context, whereby such non-vocal emissions have gained some communicative value and are voiced/verbalized whenever necessary to obtain semantic specificity.

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