

ATR VOWEL HARMONY IN AKPOSSO*

Coleen G. Anderson
SIL

This paper presents a description of the vowel harmony system of Akposso (Uwi), a Kwa language of Ghana and Togo, one of only a handful of Kwa languages with a complete ten vowel system with ATR harmony. However, the tenth vowel, /ə/, does not function as the harmonic counterpart of the low [-ATR] central vowel /a/ in affixes as it does in other ten vowel languages with cross-height vowel harmony systems. Rather, in some instances /a/ alternates with /e/ in [+ATR] contexts, while in other instances it surfaces invariably as /a/ in both [-ATR] and [+ATR] contexts. Formant measurements show the [+ATR] central vowel occupying the mid area of acoustic space, thus adding some support to the view that [+ATR] central vowels in ATR harmony systems are phonetically non-low rather than low, the more widely-assumed position. Although vowel harmony applies to a significant number of affixes, especially in the verb morphology, there are interesting limitations on how far harmony extends.

1. Introduction

Akposso is a Kwa language spoken by about 100,000 people living in the Wawa and Amou Prefectures in the Plateau Region of Togo. Approximately 5,000 Akposso speakers also reside in the Volta Region of Ghana. The language is classified in the Left Bank subgroup of Kwa [Stewart 1989]. According to Stewart, Akposso is most clearly related to Ahlo (Igo), spoken in Togo, and Bowili (Tuwili), spoken in Ghana. The Uwi dialect of Akposso described in this paper is spoken on the Akposso Plateau. Previous studies of the language include Afolá-Amey [1995], Dozeman [1995a,b], Eklo [1987], Ring & Numuley [n.d.], Rongier [1989], and Wolf [1909].

The purpose of this paper is to describe the vowel harmony system of Akposso. Akposso vowel harmony is of the cross-height type [Stewart 1971] based on the feature Advanced Tongue Root (ATR). The harmony system has several points of

* I would like to thank Rod Casali for his encouragement and many helpful comments as I was writing this paper. Special thanks also goes to Julien Koufedzi, my Akposso consultant, for his help in supplying and recording the data which has served as the basis for this paper.

interest. Unlike most Kwa languages with a five-height cross-height vowel harmony system, Akposso has ten contrastive vowels and not nine. However, the tenth vowel, /ə/, does not regularly function as the harmonic counterpart of /a/ in affixes as it does in other ten vowel systems. There are also many instances of affix harmonization that show limitations on the extent of vowel harmony.

This study is based on a period of field work lasting roughly six years, from May 1992 until present.

2. The Akposso vowel system

2.1 Oral vowel inventory. Akposso has ten phonemic oral vowels, shown in (1).¹ Examples illustrating these vowels in different contexts are given in the Appendix.

(1)

| | front | central | back |
|-------|-------|---------|------|
| | ATR | | |
| | - | + | - |
| high: | ɪ | i | u |
| mid: | ɛ | e | ə |
| | | o | ɔ |
| low: | a | | |

Ten vowel cross-height vowel harmony systems are relatively rare in Kwa languages in comparison to nine vowel systems. An unpublished database by Casali [1998] containing data on vowel systems in 42 Kwa languages lists only three, Abbey, Abron, and Anyi (Sanvi dialect), as being possible instances of ten vowel systems. In contrast, 24 Kwa languages are listed as definite or possible instances of nine vowel systems, and 17 as definite or possible instances of seven vowel systems.

Several Kwa languages that originally had been analyzed as seven vowel systems have been shown in more recent studies to actually have complete nine vowel systems with vowel harmony, adding to the number of Kwa languages with cross-height vowel harmony systems [Casali 1997]. Languages in which nine-vowel systems have been discovered more recently include Avatime [Schuh 1995], Gonja [Casali 1997, citing Painter 1970 and Snider 1989a,b,c, 1990], and Nkonya [Casali 1997, citing Reinecke 1972, Peacock & Lear 1997, and Snider 1989a,b,c, 1990].

Akposso also was originally analyzed as having seven vowels. A very early description of Akposso, Wolf [1909], claims the following vowels as phonemic: /i, e, ɛ, a, ɔ, o, u/. In his work, Wolf consistently transcribes [ɪ, ʊ, ə] as [i, u, a], respectively. In my initial study of Akposso, I was also tempted to transcribe [ɪ] as [i] because of their acoustic similarity. In the case of [ʊ], however, I initially found

¹ Vowel length and nasalization are not contrastive in Akposso.

it more similar to [o] than [u] until the Akposso speaker with whom I was working alerted me to the fact that this sound is neither [o] nor [u] and needed to be transcribed with a different symbol. As far as [ə] and [a] are concerned, I personally do not find them particularly similar. It is possible that Wolf missed this difference because of the relatively restricted distribution of [ə]. However, it is clear from the presentation of the data in the Appendix that /a/ and /ə/ are contrastive phonemes in Akposso, making for a ten vowel system with vowel harmony.

While it is in true contrast with [-ATR] /a/, the central [+ATR] vowel /ə/ has a limited distribution and is completely missing in word-initial position in Akposso. Moreover, as we shall see, /ə/ does not fully participate in the vowel harmony system of Akposso as one would anticipate.

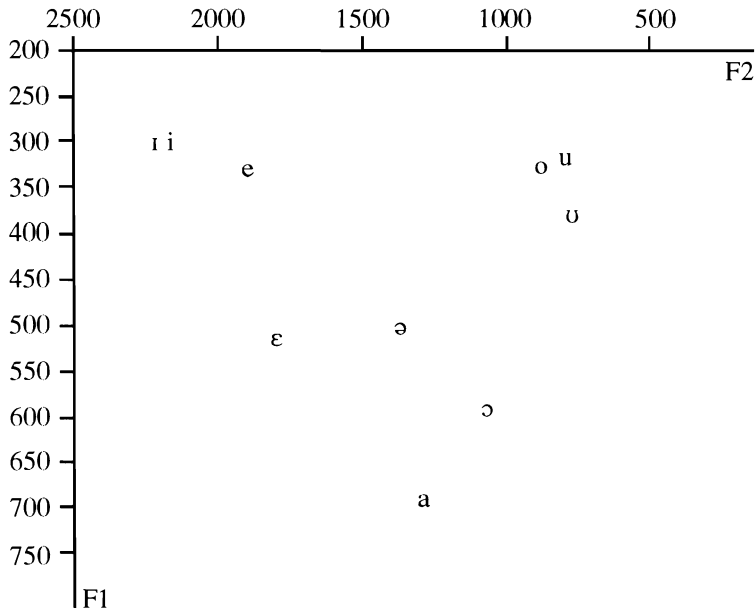
2.2 Vowel formant frequency measurements. Presented below in (2) are average values of first and second formant frequency measurements for each vowel in Akposso. Five words for each vowel in word final position were used to measure and calculate the formant averages. The words used, along with the formant values measured for each vowel, may be found in the Appendix.² These values are plotted in (3).

(2) Vowel formant measurements

| Vowel | Average F1 | Average F2 |
|-------|------------|------------|
| ATR | | |
| + - | | |
| i | 302 | 2140 |
| ɪ | 302 | 2200 |
| e | 336 | 1902 |
| ɛ | 516 | 1826 |
| ə | 504 | 1390 |
| a | 696 | 1352 |
| o | 330 | 906 |
| ɔ | 594 | 1060 |
| u | 320 | 822 |
| ʊ | 380 | 810 |

² Measurements were made using the spectrogram-with-formants and spectrum displays of the SIL WinCECIL (version 2.2) speech analysis software. Each measurement was made, where possible, at a steady state portion at or near the center of the vowel. All utterances were taken from the tape-recorded speech of an adult male speaker of the Uwi dialect.

(3) Plot of formant measurements – F2 vs. F1



There are several points of interest to be noted. First of all, there appears to be a disproportional use of acoustic space in the Akposso vowel system. There is a fairly large gap between the formant values of the [-ATR] mid vowels /ε/ and /ɔ/ and the higher front and back vowels, which are spaced together much more closely.

Secondly, the perceptual similarity of /i/ and /i/ appears to be born out in the formant measurements of these two vowels; the averages of the F1 measurements are the same. However, the high back vowels /u/ and /ʊ/ do not have similar formant measurements. Rather, [-ATR] /ʊ/ occupies an acoustic space somewhat lower than /o/. This would account for the perceptual similarity of these two vowels that I pointed out earlier.

Thirdly, the [+ATR] central vowel in (Uwi) Akposso is situated in the mid area of the acoustic space. Its formant measurements put it in a region somewhat higher than /ε/ and /ɔ/ yet lower than /e/ and /o/.

2.3 Tone. While it is beyond the scope of this paper to fully describe the tonal system of Akposso, it will be helpful to understand some basic elements of Akposso tone before proceeding into the description of the vowel harmony system.³ Akposso has three contrastive tones, high, mid, and low. From a database of 175 monosyllabic verbs, 106 verbs form minimal pairs which include seven minimal

³ I have included phonetic tone data in most of my examples in this paper. In some cases, for the purposes of clarity, I have presented only phonemic tone.

triplets. For example, /vɛ́/ ‘to sharpen’, /vɛ/ ‘to be ripe’, /vɛ̀/ ‘to jump’ and /lɔ́/ ‘to carry’, /lɔ/ ‘to hang’, /lɔ̀/ ‘to weave’.

Nouns also have a three way contrast between high, mid, and low. After H, however, there is a fourth level tone, a lower mid-tone. There is also a high-to-low falling tone and a high-to-mid falling tone after H. The table in (4) shows some minimal tone contrasts between these various tones after H. The lower mid-tone is represented by HM2 and the falling tones as H-M (high-to-mid fall) and H-L (high-to-low fall) in the example which follows.

The diacritics that are being used to indicate tone are as follows: ´ signifies high tone, ` low tone, ˘ low-rising, ˉ lower mid tone, ^ high falling. The absence of a diacritic mark signifies mid tone. I am using a convention of double vowels to mark high-to-mid or mid-to-high tone glides. Note that the doubled vowel does not imply vowel length. For example, the word for ‘throat’ in (4) above is represented as [ʒmɔ́ɔ] but ‘field mouse’ is [ʒmô].

It is worthwhile mentioning that there is some grammatical tone in the verb system and also a certain amount of tone sandhi or tonal alternations applying across morpheme boundaries in Akposso. These are the subject of a work in progress.

(4) Minimal Tone Pairs

| HH | HM | HM2 | HL | HH-M | HH-L |
|--------------------------------|-------------------------------------|-------------------------------------|----------------------------------|----------------------------------|-------------------------------------|
| ú [´] tí ‘pestle’ | ú [˘] tí ‘sorcerer’ | ú ^ˉ tí ‘fable’ | | | |
| ú [˘] lí ‘granary’ | ú [˘] lí ‘outdoors’ | ú ^ˉ lí ‘type of tree’ | | | |
| ú [˘] lú ‘kinship’ | ú [˘] lu ‘wind’ | | ú [˘] lù ‘spirit’ | | |
| | í [˘] to ‘circumcision’ | | í [˘] tò ‘body part’ | í [˘] tóo ‘mountain’ | |
| | ʒ [˘] tʃɔ ‘mahogany’ | | | | ʒ [˘] tʃɔ ‘grasshopper’ |
| | ʒ [˘] gba ‘dye’ | | | | ʒ [˘] gbâ ‘lizard’ |
| | | | | ʒ [˘] mɔ́ɔ ‘throat’ | ʒ [˘] mô ‘field mouse’ |

3. ATR vowel harmony

3.1 Vowel harmony sets. As suggested in §2, the vowels in Akposso can be divided into two non-overlapping sets, [+ATR] vowels and [-ATR] vowels, as in (5). The vowels in a root morpheme will generally be drawn from either the [+ATR] set or the [-ATR] set, as seen in the examples in (6).

(5) ATR vowel sets

| [+ATR] | | [-ATR] | |
|--------|---|--------|---|
| i | u | ɪ | ʊ |
| e | o | ɛ | ɔ |
| ə | | a | |

| | | | |
|-----|--------|--------|-----------------|
| (6) | /ísí/ | [ísí] | ‘yam’ |
| | /ófi/ | [ófi] | ‘marriage’ |
| | /ínē/ | [ínē] | ‘animal trail’ |
| | /úgbe/ | [úgbe] | ‘grasslands’ |
| | /óvè/ | [óvè] | ‘sun’ |
| | /ɪɣà/ | [ɪɣà] | ‘pig’ |
| | /ótá/ | [ótá] | ‘rabbit’ |
| | /ónā/ | [ónā] | ‘type of trap’ |
| | /únà/ | [únà] | ‘type of fruit’ |
| | /útá/ | [útá] | ‘saliva’ |
| | /éklá/ | [éklá] | ‘taboo’ |
| | /ókó/ | [ókó] | ‘twin’ |
| | /íkó/ | [íkó] | ‘box’ |
| | /ékú/ | [ékú] | ‘thing’ |
| | /ívú/ | [ívú] | ‘raffia sack’ |

With only rare exceptions, such as in loan words, a root morpheme will not contain both [+ATR] and [-ATR] vowels. This type of vowel harmony occurs in many other West African languages, including Chumburung (Kwa; Snider [1985, 1989d]), Dilo (Gur; Jones [1987]), Ega (Kwa; Bole-Richard [1981]), Foodo (Kwa; Plunkett [1991]), Kōnni (Gur; Cahill [1996]), Kasim (Gur; Bonvini [1974]), Kpokolo (Kru; Kaye, Lowenstamm & Vergnaud [1985]), Nawuri (Kwa; Casali [1988, 1995]), Tem (Gur; Tchagbale [1976]), Vata (Kru; Kaye [1982], Kiparsky [1985]).

3.2 Relative frequency of harmony sets. An examination of the vowels in a sample of 679 unique words (verbs and nouns) containing 769 vowels from my

lexical database yielded the number of tokens and percentages (in order of descending frequency) for each of the vowels as listed in (7).

| (7) | vowel | number of tokens: | percentage of total: |
|-----|-------|-------------------|----------------------|
| | /a/ | 135 | 18% |
| | /ɔ/ | 118 | 15% |
| | /ɔ̃/ | 81 | 10% |
| | /ɛ/ | 80 | 10% |
| | /i/ | 73 | 9% |
| | /ĩ/ | 70 | 9% |
| | /e/ | 68 | 9% |
| | /u/ | 62 | 8% |
| | /o/ | 47 | 6% |
| | /ə/ | 35 | 5% |

Note that there is a fairly even distribution of the high vowels and mid front vowels between the [+ATR] and [-ATR] harmony sets in Akposso. There is however a disproportionately high number of [-ATR] vowels among the mid back (15% [-ATR], vs. only 6% [+ATR]) and central (18% [-ATR], vs. only 5% [+ATR]) vowels. This causes an overall ratio of 2 to 1 [-ATR] to [+ATR] vowels. This is still a more balanced overall ratio than has been reported for some other languages however.⁴

3.3 The unusual status of /ə/. I have mentioned above that /ə/ is limited in its distribution; it never occurs word initially where all other vowels of both sets occur. It would also appear that /ə/, while contrasting with /a/ in roots, does not function as its harmonic counterpart as one would expect it to in harmonizing affixes. In these cases we see /a/ alternating instead with /e/. We will encounter many examples of this later. However, a few examples below, involving the incomplete aspect morpheme /ká/ ~ /ké/, will serve as an illustration.⁵

⁴ Cahill [1996] reports an 80% [-ATR] to 20% [+ATR] ratio for Kɔnni (Gur) verbs and nouns. Snider [1984] reports about a four to one ratio of [-ATR] to [+ATR] for words in Chumburung (Kwa). Jones' [1987] Swadesh 100 word list for Dilo shows only 30 words with one or more [+ATR] vowels, as opposed to 71 with exclusively [-ATR] vowels.

⁵ The following abbreviations are used throughout the paper.

| | | | | | |
|-----|------------|-------|-------------|---------|-------------|
| ART | article | INCMP | incomplete | P or PL | plural |
| CMP | completive | INDF | indefinite | POSS | possessive |
| DEF | definite | NOM | nominative | S | singular |
| DIM | diminutive | QUAL | qualitative | SUBJ | subjunctive |

| | | | |
|-----|--|----------|--------------------------------|
| (8) | /á-ká-té/ 3P-INCMP-build.a.nest | [ákáté] | ‘they are building a nest’ |
| | /á-ká-dá/ 3P-INCMP-vomit | [ákádá] | ‘they are vomiting’ |
| | /á-ká-kpɔ/ 3P-INCMP-hit | [ákákpɔ] | ‘they are hitting’ |
| | /á-ké-ŋi/ 3P-INCMP-close | [ákéŋi] | ‘they are closing’ |
| | /á-ké-ɣlé/ 3P-INCMP-take.the.roof.off | [ákéɣlé] | ‘they are taking the roof off’ |
| | /á-ké-gbá/ 3P-INCMP-borrow | [ákégbá] | ‘they are borrowing’ |

As one would expect, /e/ also functions as the [+ATR] counterpart of /ɛ/. This is illustrated with examples of the second person singular subject pronoun /e/ ~ /ɛ/ below. Again, we will see further examples later.

| | | | |
|-----|--|----------|-------------------------------|
| (9) | /ɛ-ká-té/ 3P-INCMP-build.a.nest | [ekáté] | ‘you are building a nest’ |
| | /ɛ-ká-dá/ 2S-INCMP-vomit | [ekádá] | ‘you are vomiting’ |
| | /ɛ-ká-kpɔ/ 2S-INCMP-hit | [ekákpɔ] | ‘you are hitting’ |
| | /ɛ-ké-ŋi/ 2S-INCMP-close | [ekéŋi] | ‘you are closing’ |
| | /ɛ-ké-ɣlé/ 2S-INCMP-take.the.roof.off | [ekéɣlé] | ‘you are taking the roof off’ |
| | /ɛ-ké-gbá/ 3P-INCMP-borrow | [ekégbá] | ‘you are borrowing’ |

The vowel /e/ is therefore functioning as the [+ATR] counterpart of both /ɛ/ and /a/ in Akposso. This “double-duty” of the vowel /e/ is something that has been noted in some languages with nine vowel cross-height harmony systems such as Avatime [Schuh 1995], Ega [Bole-Richard 1981], Igbira [Scholz 1976] and some varieties of Fante [Welmers 1973, Stewart 1971, Dolphyne 1988]. In ten vowel languages, on the other hand, one would expect /ə/ to serve as the harmonic counterpart of /a/. Examples of such languages are Kasem (Gur; Awedoba [1992]) and Deg (Gur; Crouch [pers. cor.]). To my knowledge, this is the first reported case of a ten vowel language where the contrastive counterpart of /a/ (viz. /ə/) is not also its harmonic counterpart in harmonizing affixes.

Further indication of the unusual status of /ə/ comes from a look at one of the other variants of Akposso, the Tomegbe variant of the Litime dialect. Eklo [1987] and Afolá-Amey [1995] have both accurately described the Tomegbe variant of Akposso as a nine vowel system with ATR vowel harmony. Afolá-Amey, whose work is a synchronic study of the five or six recognized dialects of Akposso,⁶ claims that the phoneme /ə/ of the Uwi dialect does not exist in this Litime variant and shows in her data that where Uwi has /ə/ in the root of a word, Litime has /a/. For example, /é-gbá/ 'he borrowed' in Uwi is /é-gbá/ in Litime. What is particularly provocative in this case is that the Litime example violates the normal rule of vowel harmony that affixes agree with the word root in their value of ATR; with a [-ATR] root such as /gbá/ one expects to see the [-ATR] form /a/ of the third person pronoun rather than the [+ATR] form /e/ (cf. /á-bà/ 'he came,' /áṅɔ̀ò/ 'he cried'). I assume that the above example /é-gbá/ historically had /ə/ as the root vowel and that this accounts for the occurrence of the [+ATR] form of the third person pronoun.

3.4 Harmonizing affixes. Like other West African languages with ATR harmony, Akposso has affixes that agree with the word root in their value of ATR. There are few, if any, true suffixes in the language, most of the affixing showing up as preverbal aspectual affixes in verb morphology. In general, these prefixes harmonize in terms of ATR with the verb root, but as we shall see below, there are limits as to how far vowel harmony may extend.

We will turn first to vowel harmony in the nominal system before proceeding to verb morphology.

3.4.1 Vowel harmony and nouns. Vowel harmony is active in two areas of noun morphology. It occurs in the vestigial evidence of a previous prefixing noun class system, and also with the definite article clitic. Let us consider first the definite article.

3.4.1.1 The definite article clitic /-é/ ~ /-é/. The definite article, /-é/ ~ /-é/, is final in the noun phrase and harmonizes with the preceding root morpheme in normal and fast speech. This harmonizing clitic is an allomorph of the definite article /jé/ which occurs in careful or emphasized speech.⁷

Examples showing harmonization of /-é/ ~ /-é/ following a head noun are given in (10). Note that, along with the harmonization of the clitic with the ATR value of

⁶ Afolá-Amey has supported the argument that Akposso can be split into two main dialects of which Uwi and Litime each characterize the main differences between the two dialect groupings. Anderson, Dozeman, Hatfield and Kluge [1992], a sociolinguistic survey conducted among the Akposso between May and September of that year, shows a 79-81% intelligibility between the two major dialects based on a 122 word list drawn from *Les listes lexicales kwa* [1983].

⁷ Although I have chosen to interpret the definite article clitic as an allomorph of /jé/, I recognize that a phonological process deleting /j/ is also possible. I have not, however, found phonological evidence for such a process being active in other areas of the language. I leave the question open for further investigation.

the noun root, the final vowel of the root also undergoes changes, in that round and high-front vowels glide while non-high, non-round vowels elide.⁸

In the examples in (11), the definite article is cliticized to an adjective which follows the head noun rather than to the head noun itself. Note that the same elision (or glide formation) and vowel harmony processes occur in this case as well.

- | | | |
|---------------------------|--------------------------|----------------------|
| (10) /ósi-é/ | [ósié] | ‘the woman’ |
| /ívló-é/ | [ívl ^w ě] | ‘the bird’ |
| /ívú-é/ | [ív ^w é] | ‘the raffia sack’ |
| /éđí-é/ | [éđíé] | ‘the palm nut’ |
| /ègà-é/ | [ègě] | ‘the money’ |
| /ínē-é/ | [ínēé] | ‘the animal trail’ |
| (11) /ívló kíkà-é/ | [ívló kíkèē] | ‘the big bird’ |
| /ívló f ^w e-é/ | [ívló fweé] | ‘the white bird’ |
| /úlí gbó-é/ | [úlí gb ^w eé] | ‘the broken granary’ |

The free form of the definite article /jé/, however, does not harmonize, as we can see in the data in (12). Here the article surfaces invariantly as [je], whether following a [-ATR] root such as in (12a), or a [+ATR] root as in (12d).

- | | | |
|-------------------|--------------|----------------------|
| (12) a. /ósi jé/ | [ósijé] | ‘the woman’ |
| b. /ívló jé/ | [ívlójé] | ‘the bird’ |
| c. /ívú jé/ | [ívújé] | ‘the raffia sack’ |
| d. /éđí jé/ | [éđíjé] | ‘the palm nut’ |
| e. /ègà jé/ | [ègàjě] | ‘the money’ |
| f. /ínē jé/ | [ínējé] | ‘the animal trail’ |
| g. /ívló kíkà jé/ | [ívlókíkàjě] | ‘the big bird’ |
| h. /ívló fwe jé/ | [ívlófwejé] | ‘the white bird’ |
| i. /úlí gbó jé/ | [úlígbójé] | ‘the broken granary’ |

3.4.1.2 Vestigial nominal class system. Most simple nouns in Akposso have the syllable shape V.C(C)V. C(C)VC(C)V also exists, but with less frequency. For the most part, the initial vowel of the noun of the V.CV type is not functioning as a noun class prefix in the usual understanding of noun classes, in that it does not have any clearly identifiable meaning or grammatical function associated with it. The initial vowel is not marking number since the vowels of the singular and plural forms are identical. Plurality is indicated instead by the particle /wáni/.

⁸ For further description on the process of elision and glide formation in Akposso, see Dozeman [1995a].

| | | | | |
|------|---------|---------------|--------------|----------------|
| (13) | /ɪvlóɔ/ | ‘bird’ | /ɪvlóɔ wání/ | ‘birds’ |
| | /ʒazà/ | ‘sheep’ | /ʒazà wání/ | ‘sheep’ |
| | /ɪvú/ | ‘raffia sack’ | /ɪvú wání/ | ‘raffia sacks’ |
| | /éďí/ | ‘palm nut’ | /éďí wání/ | ‘palm nuts’ |

However, in a few cases, the initial vowel of the V.CV pattern points clearly to a marginal noun class system in Akposso. Two very limited classes consisting largely of human beings and animals have been found. In the first of these classes a singular prefix /ɔ/ ~ /u/ corresponds with /a/ ~ /e/ in the plural. Thus [+ATR] roots have /u/ in the singular and /e/ in the plural while [-ATR] roots have /ɔ/ in the singular and /a/ in the plural. This can be seen in the examples in (14).

| | | | | |
|------|---------------------------|---------------------------------|----------|---------------------------------|
| (14) | Singular prefix /u/ ~ /ɔ/ | Plural prefix /e/ ~ /a/ | | |
| | /ú-mlóo/ | ‘child’ | /é-mlóo/ | ‘children’ |
| | /ú-kpî/ | ‘dog’ | /é-kpî/ | ‘dogs’ |
| | /ú-luví/ | ‘male’ | /é-luví/ | ‘males’ |
| | /ú-vle/ | ‘boar’ | /é-vle/ | ‘boars’ |
| | /ù-gbâ/ | ‘gorilla’ | /à-gbâ/ | ‘gorillas’ |
| | /ɔ-kpa/ | ‘person of a same age group’ | /a-kpa/ | ‘people of a same age group’ |

As I have said above, the [+ATR] central vowel is limited in its distribution to the roots of words; thus it is not surprising that /ə/ does not function in the right hand column as the [+ATR] form of the plural prefix corresponding to [-ATR] /a/. We will see more examples of this kind of alternation in Akposso in the verb morphology section below.

In the second noun class, limited to human beings, singular /o/ ~ /ɔ/ corresponds to plural /a/. Note that in this class of nouns, in contrast with the class above, plural /a/ does not alternate harmonically, but shows up as a [-ATR] low with roots of both ATR sets.

| | | | | |
|------|---------------------------|-------------------|------------|---------------|
| (15) | Singular prefix /o/ ~ /ɔ/ | Plural prefix /a/ | | |
| | /ó-levì/ | ‘young man’ | /á-levì/ | ‘young men’ |
| | /ó-sjetfū/ | ‘young woman’ | /á-sjetfū/ | ‘young women’ |
| | /ʒ-lu/ | ‘person’ | /á-lu/ | ‘people’ |
| | /ʒ-sɪ/ | ‘woman’ | /á-sɪ/ | ‘women’ |

3.4.2 Vowel harmony and verb morphology. As stated previously, Akposso has preverbal aspectual affixes which harmonize for ATR with the verb root. Akposso verb morphology employs the following morphemes: a subject pronoun marker, a morpheme marking negation, various aspect morphemes, and the verb root, as schematized in (16).

(16) Verb = Subj Prn + (Negation) + Aspect + Verb Root

There are some limitations to the extent of harmony within the morphological word, but we will first turn to the various aspects and morphemes which clearly harmonize before addressing these limitations. It is worth noting that aspect in Akposso is marked with a combination of segments and tone. However, some aspects, such as the inceptive /ja/ ~ /je/, are unmarked for tone in their underlying forms. Let us begin with the incomplete.

3.4.2.1 Incomplete. The incomplete aspect in Akposso is formed with the morpheme /ká/ ~ /ké/, which agrees in its ATR value with the verb root.

(17) With [-ATR] roots:

| | | |
|------------|----------|----------------------------|
| /á-ká-dá/ | [ákádá] | ‘they are vomiting’ |
| /á-ká-kpɔ/ | [ákákpɔ] | ‘they are hitting’ |
| /á-ká-té/ | [ákáté] | ‘they are building a nest’ |
| /á-ká-ló/ | [ákáló] | ‘they are carrying’ |
| /á-ká-tʃí/ | [ákátʃí] | ‘they are cutting’ |

With [+ATR] roots:

| | | |
|------------|----------|--------------------------------|
| /á-ké-ŋ/ | [ákéŋ] | ‘they are closing’ |
| /á-ké-ɣlé/ | [ákéɣlé] | ‘they are taking the roof off’ |
| /á-ké-gbá/ | [ákégbá] | ‘they are borrowing’ |
| /á-ké-bó/ | [ákébó] | ‘they are uprooting’ |
| /á-ké-kù/ | [ákékù] | ‘they are driving’ |

Notice here again that the [+ATR] counterpart of /a/ is not /ə/ but rather /e/. Also noteworthy is the fact that the third person plural subject pronoun /a/ does not harmonize. This is true for this pronoun in all other contexts as well. As we will see below, the other subject pronouns do harmonize in certain contexts.

3.4.2.2 Inceptive. The inceptive is formed with the morpheme /ja/ ~ /je/ (with no tone specified in its underlying form). It harmonizes in much the same way as the incomplete; /ja/ occurs before [-ATR] roots, while /je/ occurs with [+ATR] roots.

(18) With [-ATR] roots:

| | | |
|------------|----------|--------------------------------------|
| /á-já-tʃí/ | [ájátʃí] | ‘they are beginning to cut’ |
| /á-já-té/ | [ájáté] | ‘they are beginning to build a nest’ |
| /á-já-dá/ | [ájádá] | ‘they are beginning to vomit’ |
| /á-já-lú/ | [ájálú] | ‘they are beginning to carry’ |
| /á-já-kpɔ/ | [ájákpɔ] | ‘they are beginning to hit’ |

With [+ATR] roots:

| | | |
|------------|----------|---|
| /á-jé-mli/ | [ájémli] | ‘they are getting up’ |
| /á-jé-ɣlé/ | [ájéɣlé] | ‘they are beginning to take the roof off’ |
| /á-jé-gbá/ | [ájégbá] | ‘they are beginning to borrow’ |
| /á-jé-bó/ | [ájébó] | ‘they are beginning to uproot’ |
| /á-jé-kù/ | [ájékù] | ‘they are beginning to drive’ |

3.4.2.3 Negation. Harmony also affects the negative morpheme /nà/ ~ /nè/ when it directly precedes the verb root, as in (19).

(19) With [-ATR] roots:

| | | |
|------------|----------|-----------------------------|
| /á-nà-tʃí/ | [ánâtʃí] | ‘they did not cut’ |
| /á-nà-té/ | [ánâté] | ‘they did not build a nest’ |
| /á-nà-dá/ | [ánâdá] | ‘they did not vomit’ |
| /á-nà-kpɔ/ | [ánâkpɔ] | ‘they did not hit’ |
| /á-nà-lú/ | [ánâlú] | ‘they did not carry’ |

With [+ATR] roots:

| | | |
|------------|----------|----------------------------------|
| /á-nè-ŋi/ | [ánêŋi] | ‘they did not close’ |
| /á-nè-ɣlé/ | [ánêɣlé] | ‘they did not take the roof off’ |
| /á-nè-gbá/ | [ánêgbá] | ‘they did not borrow’ |
| /á-nè-bó/ | [ánêbó] | ‘they did not uproot’ |
| /á-nè-kù/ | [ánêkù] | ‘they did not drive’ |

3.4.2.4 Completive. The completive aspect is formed with the morpheme /a/ ~ /e/, as illustrated by the examples in (20).⁹

⁹ High tone appears to be a part of marking the completive aspect, showing up on high and low tone verbs. Mid tone, however, seems to be resistant to tone perturbation.

(20) With [-ATR] roots:¹⁰

| | | |
|------------|----------|-------------------------|
| /mɪ-a-tʃí/ | [mʲatʃí] | ‘you (pl) cut’ |
| /mɪ-a-té/ | [mʲaté] | ‘you (pl) built a nest’ |
| /mɪ-a-dá/ | [mʲadá] | ‘you (pl) vomited’ |
| /mɪ-a-ló/ | [mʲaló] | ‘you (pl) carried’ |
| /mɪ-a-kpɔ/ | [mʲakpɔ] | ‘you (pl) hit’ |

With [+ATR] roots:

| | | |
|------------|----------|------------------------------|
| /mi-e-mli/ | [mʲemli] | ‘you (pl) got up’ |
| /mi-e-ɣlé/ | [mʲeɣlé] | ‘you (pl) took off the roof’ |
| /mi-e-gbá/ | [mʲegbá] | ‘you (pl) borrowed’ |
| /mi-e-bó/ | [mʲebó] | ‘you (pl) uprooted’ |
| /mi-e-kù/ | [mʲekú] | ‘you (pl) drove’ |

3.4.2.5 Imminent future. The imminent future is formed with the morpheme /à/ ~ /è/, as in (21).

(21) With [-ATR] roots:

| | | |
|------------|----------|------------------------------|
| /mɪ-à-tʃí/ | [mʲàtʃí] | ‘you (pl) will cut’ |
| /mɪ-à-té/ | [mʲàté] | ‘you (pl) will build a nest’ |
| /mɪ-à-dá/ | [mʲàdá] | ‘you (pl) will vomit’ |
| /mɪ-à-ló/ | [mʲàló] | ‘you (pl) will carry’ |
| /mɪ-à-kpɔ/ | [mʲàkpɔ] | ‘you (pl) will hit’ |

With [+ATR] roots:

| | | |
|------------|----------|-----------------------------------|
| /mi-è-mli/ | [mʲěmli] | ‘you (pl) will get up’ |
| /mi-è-ɣlé/ | [mʲèɣlé] | ‘you (pl) will take the roof off’ |
| /mi-è-gbá/ | [mʲègbá] | ‘you (pl) will borrow’ |
| /mi-è-bó/ | [mʲèbó] | ‘you (pl) will uproot’ |
| /mi-è-kù/ | [mʲèkú] | ‘you (pl) will drive’ |

3.4.2.6 Predictive. The predictive is formed in much the same way as the imminent future but with the addition of the auxiliary verb /bá/ ~ /bé/ ‘to come’. Note

¹⁰ Although I have transcribed [mɪ-] ~ [mi-] as [mʲ] phonetically in this example, they remain distinct at slower rates of speech, [mʲ] ~ [mɪ]. When these pronouns precede consonant-initial morphemes, the vowels remain fully syllabic, for example /mɪ-ká-kpɔ/ ‘you (pl.) are hitting’, /mi-ké-kù/ ‘you (pl.) are driving’.

(22) With [-ATR] roots:

| | | |
|---------------|------------|--|
| /mɪ-à-bá-tʃí/ | [mʲàbátʃí] | ‘you (pl) will cut (one day)’ |
| /mɪ-à-bá-té/ | [mʲàbáté] | ‘you (pl) will build a nest (one day)’ |
| /mɪ-à-bá-dá/ | [mʲàbádá] | ‘you (pl) will vomit (one day)’ |
| /mɪ-à-bá-lú/ | [mʲàbálú] | ‘you (pl) will carry (one day)’ |
| /mɪ-à-bá-kpɔ/ | [mʲàbákɔ] | ‘you (pl) will hit (one day)’ |

With [+ATR] roots:

| | | |
|---------------|------------|---|
| /mɪ-à-bé-mli/ | [mʲàbémlɪ] | ‘you (pl) will get up (one day)’ |
| /mɪ-à-bé-ɣlé/ | [mʲàbéɣlé] | ‘you (pl) will take the roof off (one day)’ |
| /mɪ-à-bé-gbá/ | [mʲàbégbá] | ‘you (pl) will borrow (one day)’ |
| /mɪ-à-bé-bó/ | [mʲàbébó] | ‘you (pl) will uproot (one day)’ |
| /mɪ-à-bé-kù/ | [mʲàbékú] | ‘you (pl) will drive (one day)’ |

here that although the /à/ prefix in these examples is presumably the same morpheme that is used with the imminent future, it does not harmonize here for ATR (as it does in the imminent future), but retains an invariant [-ATR] form even before [+ATR] verbs. It is a general characteristic of Akposso that harmony will spread only one syllable to the left of the verb in the aspectual system. We will consider this in more detail later on.

3.4.2.7 Subject pronouns. As mentioned above, subject pronouns, apart from the third person plural, can undergo harmony in certain contexts. Subject pronouns generally do not occur directly before the verb root; an aspect marker or other morpheme always intervenes. These subject pronouns do, however, harmonize with some of the aspect markers we have seen so far: the incomplete, inceptive, and negation markers. In (23)-(25), I illustrate a verb of each ATR set with a complete pronoun paradigm for these three aspects.

(23) With Incomplete

| | | |
|----------------|----------|------------------------|
| a. /nɪ-ká-kpɔ/ | [nɪkákɔ] | ‘I am hitting’ |
| /ɛ-ká-kpɔ/ | [ɛkákɔ] | ‘you are hitting’ |
| /ɔ-ká-kpɔ/ | [ɔkákɔ] | ‘he is hitting’ |
| /wɔ-ká-kpɔ/ | [wɔkákɔ] | ‘we are hitting’ |
| /mɪ-ká-kpɔ/ | [mɪkákɔ] | ‘you (pl) are hitting’ |
| /á-ká-kpɔ/ | [ákákɔ] | ‘they are hitting’ |

| | | | |
|----|------------|----------|------------------------|
| b. | /ni-ké-kù/ | [nikékû] | ‘I am driving’ |
| | /e-ké-kù/ | [ekékû] | ‘you are driving’ |
| | /ó-ké-kù/ | [ókékû] | ‘he is driving’ |
| | /wu-ké-kù/ | [wukékû] | ‘we are driving’ |
| | /mi-ké-kù/ | [mikékû] | ‘you (pl) are driving’ |
| | /á-ké-kù/ | [ákékû] | ‘they are driving’ |

(24) With Inceptive

| | | | |
|----|-------------|-----------|-----------------------------------|
| a. | /ni-ja-kpɔ/ | [nijakpɔ] | ‘I’m beginning to hit’ |
| | /e-ja-kpɔ/ | [ɛjakpɔ] | ‘you are beginning to hit’ |
| | /ó-ja-kpɔ/ | [ójákpɔ] | ‘he is beginning to hit’ |
| | /wu-ja-kpɔ/ | [wojakpɔ] | ‘we are beginning to hit’ |
| | /mi-ja-kpɔ/ | [mijakpɔ] | ‘you (pl) are beginning to hit’ |
| | /á-ja-kpɔ/ | [ájákpɔ] | ‘they are beginning to hit’ |
| b. | /ni-je-kù/ | [nijekù] | ‘I am beginning to drive’ |
| | /e-je-kù/ | [ɛjekù] | ‘you are beginning to drive’ |
| | /ó-je-kù/ | [ójékù] | ‘he is beginning to drive’ |
| | /wu-je-kù/ | [wujekù] | ‘we are beginning to drive’ |
| | /mi-je-kù/ | [mijekù] | ‘you (pl) are beginning to drive’ |
| | /á-je-kù/ | [ájékù] | ‘they are beginning to drive’ |

(25) With Negation

| | | | |
|----|-------------|------------|--------------------------|
| a. | /ni-nà-kpɔ/ | [ninàkpɔ̄] | ‘I did not hit’ |
| | /e-nà-kpɔ/ | [ɛnàkpɔ̄] | ‘you did not hit’ |
| | /ó-nà-kpɔ/ | [ónàkpɔ̄] | ‘he did not hit’ |
| | /wu-nà-kpɔ/ | [wonàkpɔ̄] | ‘we did not hit’ |
| | /mi-nà-kpɔ/ | [minàkpɔ̄] | ‘you (pl) did not hit’ |
| | /á-nà-kpɔ/ | [ánàkpɔ̄] | ‘they did not hit’ |
| b. | /ni-nè-kù/ | [ninèkù] | ‘I did not drive’ |
| | /e-nè-kù/ | [ɛnèkù] | ‘you did not drive’ |
| | /ó-nè-kù/ | [ónèkù] | ‘he did not drive’ |
| | /wu-nè-kù/ | [wunèkù] | ‘we did not drive’ |
| | /mi-nè-kù/ | [minèkù] | ‘you (pl) did not drive’ |
| | /á-nè-kù/ | [ánèkù] | ‘they did not drive’ |

3.4.2.8 Subjunctive. As mentioned above, subject pronouns do not generally occur directly before the verb root. In the case of the subjunctive, however, we have a pronoun inventory which differs slightly from the normal subject pronouns. These subjunctive pronouns, which are formed (in every case but the first person singular) by prefixing the consonant /k-/ to the ordinary subject pronouns and adding high tone, do occur immediately before the verb root, as shown in (26).¹¹

| | |
|--|-----------------------------|
| (26) /á-fú nɔ ní-kpɔ/ 3S.COMP-want COMP 1S.SUBJ-hit | ‘he wants me to hit’ |
| /áfú nɔ ké-kpɔ/ 2S.SUBJ-hit | ‘he wants you to hit’ |
| /áfú nɔ kó-kpɔ/ 3S.SUBJ-hit | ‘he wants him to hit’ |
| /áfú nɔ kú-kpɔ/ 1P.SUBJ-hit | ‘he wants us to hit’ |
| /áfú nɔ kí-kpɔ/ 2P.SUBJ-hit | ‘he wants you(pl) to hit’ |
| /áfú nɔ ká-kpɔ/ 3P.SUBJ-hit | ‘he wants them to hit’ |
| | |
| /áfú nɔ ní-dʒɔ/ 3S.COMP-want COMP 1S.SUBJ-cook | ‘he wants me to cook’ |
| /áfú nɔ ké-dʒɔ/ 2S.SUBJ-cook | ‘he wants you to cook’ |
| /áfú nɔ kó-dʒɔ/ 3S.SUBJ-cook | ‘he wants him to cook’ |
| /áfú nɔ kú-dʒɔ/ 1P.SUBJ-cook | ‘he wants us to cook’ |
| /áfú nɔ kí-dʒɔ/ 2P.SUBJ-cook | ‘he wants you (pl) to cook’ |
| /áfú nɔ ká-dʒɔ/ 3P.SUBJ-cook | ‘he wants them to cook’ |

3.4.2.9 Imperative. The imperative also undergoes vowel harmony, both in its positive and negative forms. In the positive form, the second person singular is equivalent to the citation form of the verb root, therefore it will not be considered here. The second person plural is formed with /i/ ~ /í/ and the first person plural with the same form as the subjunctive, /kú/ ~ /kú́/.

¹¹ Segmentally, these pronouns consist, except in the case of the first person singular, of the vowel of the ordinary (non-subjunctive) subject pronoun preceded by the consonant /k/ (which replaces the consonant of the ordinary subject pronoun in the case of the first and second person plural forms). Although this generalization is surely no accident, we will regard these pronouns for purposes of this paper simply as portmanteau morphemes marking both person-number and subjunctive aspect. Tonally, these subjunctive pronouns are uniformly high.

- | | | | |
|------|----------|---------|--------------------|
| (27) | /i-kpɔ/ | [íkɔ] | ‘you (pl) hit!’ |
| | /kú-kpɔ/ | [kúkɔ] | ‘let’s hit’ |
| | /i-mli/ | [ímli] | ‘you (pl) get up!’ |
| | /kú-mli/ | [kúmli] | ‘let’s get up’ |

Imperative negation is formed with the morpheme /fâ/ ~ /fê/, which directly precedes the verb root, and a particle /mɛ/, which follows the verb. Again, the same pronoun markers are employed Ø, /i/ ~ /í/, /kú/ ~ /kú/, for the second person singular, second person plural, and first person plural, respectively, as in (28).

- | | | | |
|------|----------------|-------------|-------------------------|
| (28) | /fâ-kpɔ mɛ/ | [fâkpɔmɛ] | ‘don’t hit!’ |
| | /i-fâ-kpɔ mɛ/ | [ífâkpɔmɛ] | ‘you (pl) don’t hit!’ |
| | /kú-fâ-kpɔ mɛ/ | [kúfâkpɔmɛ] | ‘let’s not hit’ |
| | /fê-mli mɛ/ | [fêmlimɛ] | ‘don’t get up’ |
| | /i-fê-mli mɛ/ | [ífêmlimɛ] | ‘you (pl) don’t get up’ |
| | /kú-fê-mli mɛ/ | [kúfêmlimɛ] | ‘let’s not get up’ |

3.5 Extent of harmony. In the previous section, I presented an overview of harmonizing affixes in Akposso. As suggested above, there are some limitations to the extent of vowel harmony within verb morphology. This is also true for noun morphology. However, before we turn to this issue, let us first consider the extent of vowel harmony across word boundaries.

3.5.1 Word boundaries. As far as I have been able to ascertain, vowel harmony does not extend across word boundaries in Akposso. Rather, it appears that the spread of vowel harmony is restricted to the morphological word (and, as we shall see below, applies only to a limited extent within the morphological word). This may be due to a constraint in the language whereby the harmony of a morphological word is root controlled and the ATR quality of one root cannot interfere with the ATR quality of an adjacent root. Consider the examples in (29)-(34),

(29) Verb + Noun

- | | | |
|-----------------------|------------------------|-------------------------|
| /ɔ-dú édí ñ/ | [ɔd ^w édíñ] | ‘he is joyful’ |
| 3S-be joy in | | |
| /ɔ-dú édíñ/ | [ɔd ^w édíñ] | ‘he is inside the room’ |
| 3S-be room | | |
| /é-tʃíkə ivi/ | [étʃíkivi] | ‘it turned into water’ |
| 3S.COMP-become water | | |
| /é-tʃíkə ílɛ/ | [étʃíkílɛ] | ‘it became a cavity’ |
| 3S.COMP-become cavity | | |

(30) Verb + Adverb

| | |
|---|--|
| /émekù jé ké-mli gùgùlùgù/ belly ART INCOMP–get.up swollen | [émek ^w ěkémligùgùlùgù] ‘the belly is swollen’ |
| /á-blí ma gùgùlùgù/ 3S.COMP–squirt plant swollen | [áblímagùgùlùgù] ‘it’s pushed out and swollen’ |
| /á-ló gbígbígbí/ 3S–black very.black | [álógbígbígbí] ‘it’s very black’ |
| /é-tʃíkə klókóló/ 3S–turn rapidly | [étʃíkəkólókóló] ‘he’s turning back and forth rapidly’ |

(31) Noun Phrase + Verb

| | |
|---|--|
| /ótá é-ɸi ótó ñi/ rabbit 3S.CMP–enter hole in | [ótéɸiótóñi] ‘the rabbit went into the hole’ |
| /kofí á-ká ó-ná íbō/ Koffi 3S.CMP–give 3S.POSS–mother calabash | [kofíákóníbō] ‘Koffi gave his mother the calabash’ |
| /ólóná sētu á-ká ódé ɔtʃò/ work hard 3S–cause old.age quickly | [ólónásét ^w akúódóɔtʃò] ‘hard work makes you grow old quickly’ |
| /ólóná é-sētu/ work 3S–hard | [ólónésētu] ‘work is hard’ |
| /úkpi á-tʃi ògló/ dog 3S.CMP–bite rat | [úkpiàtʃiogló] ‘the dog bit the rat’ |

(32) Noun Phrase + Adverb

| | |
|--|--|
| /ámâ nù étu gbígbí/ appearance like body black | [ámânētugbígbí] ‘he has a very black body’ |
| /é-tʃíkə nù émú jě klókólò/ 3S–turn like eye ART back.and.forth | [étʃíkənèm ^w éklókólò] ‘he’s turning his eyes like an owl’ |

(33) Indirect Object + Direct Object

| | |
|--|---|
| /kofí á-ká ó-ná íle/ Koffi 3S–give 3S.POSS–mother ladle | [kofíákóníle] ‘Koffi gave his mother the ladle’ |
| /kofí á-ká ó-nédzə íbō/ Koffi 3S–give 3S.POSS–sister calabash | [kofíákónédzəíbō] ‘Koffi gave his sister the calabash’ |

(34) Noun + Adjective

| | |
|---|--|
| /ólóná sētu-ě/ work hard–ART | [ólónásét ^{wě}] 'the hard work' |
| /mutí ve á-bwé nù ɔɲwà/ orange ripe 3S–good for drinking | [mutívábwénóɲwà] 'a ripe orange is good for drinking' |

which show that ATR harmony does not spread between a verb and its object, between a verb and a following adverb, between a noun phrase and a following verb, between a noun phrase and a following adverb, between an indirect object and a following direct object, or between a noun and a following adjective. Note that the general process in Akposso that elides or glides the first of two adjacent vowels is operative in many of the examples below. The elision and glide formation process has no affect whatsoever on the ATR quality of the adjacent root.

3.5.2 Nominal contexts. Vowel harmony within the Akposso noun phrase, with the exception of the two cases presented above in section 3.4.1, does not appear to extend across morpheme boundaries. Within the inventory of definite and indefinite articles (singular and plural), for example, only the bound form of the definite article /-é/ ~ /-ě/ undergoes harmony. The other articles, the definite article /jé/ (which we saw earlier), as well as /dɪ/, /dɪnɪ/, the singular and plural forms of the indefinite article, and also /wá/, /nɪ/, /wánɪ/, the definite plural forms, do not.¹² We will look at examples of the indefinite articles and the plural.

| | | |
|--------------------------------|-----------|-----------------------|
| (35) /ísí dɪ/ yam INDF | [ísídɪ] | 'a (certain) yam' |
| /ísí dɪ-nɪ/ yam INDF–PL | [ísídɪnɪ] | 'some (certain) yams' |
| /ísí wá-nɪ/ yam DEF–PL | [ísíwánɪ] | 'yams' |
| /á-leví-nɪ/ PL–young men–PL | [álevɪnɪ] | 'young men' |

True noun-noun (N–N) compounds in Akposso are relatively rare. We shall see a few examples of such compounds later. However, Akposso has a highly productive N–N construction. The first component of this construction consists of a noun whose form is identical to its citation form. The second component consists of a noun root minus its initial vowel and tone. Both components maintain their underlying ATR value. Consider the examples in (36) of the N–N construction.

¹² I have recognized various forms of pluralization in Akposso and understand that they are functioning differently on the discourse level. This is a study in process.

- (36) a. /ókpó/ + /ínē/ [ókpónē] ‘deer trail’
 deer trail
- b. /úṙi/ + /ínē/ [úṙinē] ‘elephant trail’
 elephant trail
- c. /ézô/ + /áwé/ [ézôwē] ‘pot with porridge residue in it’
 porridge pot
- d. /úmólí/ + /áwé/ [úmólíwē] ‘pot with rice residue in it’
 rice pot
- e. /úsé/ + /íkó/ [úsékô] ‘honey jar’
 honey gourd
- f. /ólókū/ + /íkó/ [ólókūkò] ‘salt shaker’
 salt gourd
- (37) a. /ófí-kó/ [ófíkó] ‘palm wine container’
 drink-gourd
- b. /úlí-tjúu/ [úlítjúu] ‘wood in a granary used as step’
 granary-wood
- c. /ómíó-ní/ [ómíóní] ‘hunter’
 hunt-NOM
- d. /ékpe-ní/ [ékpení] ‘hiker’
 hike-NOM
- e. /ívi-dzá/ [ívidzá] ‘cemetery’
 furrow-place
- f. /ékpe-dzá/ [ékpedzá] ‘hunting grounds’
 hunt-place
- g. /óɣlɔ-vju/ [óɣlɔvju] ‘chick’
 chicken-DIM
- h. /úkpî-vju/ [úkpîvju] ‘puppy’
 dog-DIM
- i. /òbè-tɔ/ [òbètɔ] ‘creek’
 river-DIM
- j. /èvídʒe-tɔ/ [èvídʒetɔ] ‘tiny child’
 child-DIM
- k. /ínâ-kà/ [ínâkà] ‘grandmother’
 mother-QUAL
- l. /úgbekà/ [úgbekà] ‘large grasslands’
 savanna-QUAL
- m. /ékú-jí/ [ékújí] ‘merchandise (bought thing)’
 thing-buy
- n. /ékú-jè/ [ékújè] ‘food (edible things)’
 thing-eat

Morphologically complex nouns, those formed through derivation, nominalization, and compounding, etc., also do not harmonize for ATR throughout the entire word, as this would extend across a morpheme boundary, as shown in (37).

3.5.3 Verb morphology. In section 3.4.2, we considered the various prefixing aspects and morphemes which harmonize with the verb root. Of the various aspects I have thus encountered in my study of Akposso, only one, the repetitive morpheme, /tʃí/, fails to harmonize with the verb root, as shown in (38). The same form of the morpheme occurs whether preceding [+ATR] or [-ATR] verb roots.

| | | | |
|------|-------------|-----------|-----------------------|
| (38) | /na-tʃí-bá/ | [natʃíbǎ] | ‘I’ve come again’ |
| | /na-tʃí-jè/ | [natʃíjè] | ‘I’ve eaten again’ |
| | /na-tʃí-vu/ | [natʃívu] | ‘I’ve bought again’ |
| | /na-tʃí-bó/ | [natʃíbǒ] | ‘I’ve uprooted again’ |

As I have suggested elsewhere, there are limits to the extent of vowel harmony in prefixing aspects. It would appear that in the aspectual sequence, only the syllable directly preceding the verb root harmonizes. All other syllables in the aspectual sequence surface invariantly in their underlying [-ATR] form.

| | | | |
|------|-------------------|--------------------|----------------------------|
| (39) | a. /ʒm-á-bá-bá/ | [ʒmábábá] | ‘he will come (someday)’ |
| | b. /ʒm-á-bé-mli/ | [ʒmábémli] | ‘he will get up (someday)’ |
| | | (not *[ómébémli]) | |
| | c. /ʒ-nà-má-bá/ | [ʒnāmábá] | ‘he will not come’ |
| | d. /ʒ-nà-mé-mli/ | [ʒnāmēmli] | ‘he will not get up’ |
| | | (not *[ónēmēmli]) | |
| | e. /ʒ-nà-dʒa-bá/ | [ʒnâdʒābā] | ‘he has not come yet’ |
| | f. /ʒ-nà-dʒe-mli/ | [ʒnâdʒēmli] | ‘he has not got up yet’ |
| | | (not *[ónêdʒēmli]) | |

This becomes even more clear in the case of the disyllabic morpheme /kɔna/ (which marks the incompletive when it follows the negative marker) in which only the syllable immediately preceding the verb root harmonizes. While it is entirely possible that historically this was in fact two separate morphemes, synchronically it is functioning as a single morpheme.

| | | |
|------|------------------|---------------------|
| (40) | /nɪ-nà-kɔna-kpɔ/ | ‘I’m not hitting’ |
| | /nɪ-nà-kɔne-bó/ | ‘I’m not uprooting’ |
| | /nɪ-nà-kɔna-tʃí/ | ‘I’m not cutting’ |
| | /nɪ-nà-kɔne-kù/ | ‘I’m not driving’ |

[+ATR] harmony, however, will spread to a subject pronoun that directly precedes a [+ATR] aspect marker; in this case, a span of two syllables to the left of the verb root is affected. We have seen many examples of this in section 3.4. Consider the following examples by way of review.

- | | | | |
|------|-------------|-----------|---------------------------|
| (41) | /ni-nè-kù/ | [ninèkù] | ‘I did not drive’ |
| | /ni-nà-kpɔ/ | [ninàkpɔ] | ‘I did not hit’ |
| | /ni-je-kù/ | [nijekù] | ‘I am beginning to drive’ |
| | /ni-ja-kpɔ/ | [nijakpɔ] | ‘I’m beginning to hit’ |

Note that, in examples (41) above, the negative morpheme /nà/ ~ /nè/ does harmonize with a verb root which it directly precedes, in contrast to some of the examples in (39) above which have an intervening aspect marker between the negative marker and the verb root.

3.5.4 Loan words. There is a general tendency for loan words to conform to vowel harmony constraints within Akposso. Consider the following English loan words that have been “Akpossoized”. All vowels within the morpheme conform to one ATR set or the other.

- | | | |
|------|----------|------------------|
| (42) | /tʃótʃi/ | ‘church’ |
| | /pɔ́mpì/ | ‘pump’ |
| | /pánî/ | ‘pan’ |
| | /kófê/ | ‘coffee’ |
| | /péjə/ | ‘avocado (pear)’ |
| | /púsù/ | ‘cat’ |

The Akan names for days of the week have been borrowed into Akposso, as in many of the languages spoken in the southern regions of Togo and Ghana. The Akan word [dʒ^woda] for Monday has been borrowed into Ewe and Akposso as [dʒɔ́dá] and [dʒɔdɔ́], respectively. Because the central vowel is part of a root whose initial vowel is interpreted as [+ATR] in Akposso, the /a/ is borrowed in as /ə/ in order to conform to harmony.

Compare this with the Ewe word [àtíkè] ‘medicine’, which has been borrowed into Akposso as [àtíke]. Here a central vowel preceding [+ATR] vowels does not surface as [+ATR] [ə], but as [-ATR] [a]. In general, /a/ preceding [+ATR] vowels tends to be quite resistant to harmony. This is well within the normal behavior of the Akposso vowel harmony system, as we have seen other examples of [+ATR] harmony not extending to initial /a/, such as the case of the third person plural subject pronoun in verb morphology, and also the second of our two vestigial noun classes, which takes /a/ rather than /ə/ as its plural prefix. Other words, whose origin is less clear, like [àkláte] ‘banana’ and [ànásé] ‘pineapple’ also fall into this category.

APPENDIX

The following data illustrate each vowel in Akposso in word-final, word-initial, and word-medial position. The first set of words, used to illustrate vowels in word-final position, were also used to make measurements of the first and second formant frequencies of the word-final vowels. These measurements appear next to each word. (Average values of the formant measurements for each vowel, presented earlier in (2), are listed following each vowel.)

The diacritics that are being used to indicate tone are as follows: ´ signifies high tone, ` low tone, ~ low-rising, ¯ lower mid tone, ^ high falling. The absence of a diacritic mark signifies mid tone.

| word-final position | | F1 | F2 | |
|---------------------|--------------------------------------|------------------------|-----|------|
| /i/: | [éđí] | ‘palm nut’ | 300 | 2040 |
| | [úlí] | ‘granary’ | 350 | 2110 |
| | [kĩ] | ‘to stay’ | 300 | 2240 |
| | [bĩ] | ‘to spoil’ | 270 | 2090 |
| | [mli] | ‘to stand up’ | 290 | 2220 |
| | Average formant measurements for /i/ | | 302 | 2140 |
| /ɪ/: | [éđɪ] | ‘joy’ | 300 | 2130 |
| | [áɪ] | ‘village’ | 300 | 2360 |
| | [bĩ] | ‘to cry’ | 280 | 2220 |
| | [tɪ] | ‘to bite, cut’ | 300 | 2260 |
| | [ɲĩ] | ‘to fall’ | 330 | 2030 |
| | Average formant measurements for /ɪ/ | | 302 | 2200 |
| /e/: | [ohé] | ‘one born after twins’ | 330 | 1970 |
| | [úsé] | ‘honey’ | 360 | 1820 |
| | [élúté] | ‘oven’ | 360 | 1960 |
| | [kpe] | ‘to hunt’ | 300 | 2130 |
| | [ně] | ‘to drill a hole’ | 330 | 1630 |
| | Average formant measurements for /e/ | | 336 | 1902 |
| /ɛ/: | [èkɛtè] | ‘palm branch sack’ | 450 | 1970 |
| | [ósé] | ‘tail’ | 540 | 1680 |
| | [ésé] | ‘abstract thing’ | 480 | 1680 |
| | [tɛ] | ‘to take, receive’ | 540 | 1930 |
| | [vɛ] | ‘to ripen’ | 570 | 1870 |
| | Average formant measurements for /ɛ/ | | 516 | 1826 |

| | | | | |
|--------------------------------------|----------|------------------|-----|------|
| /ə/: | [ɪkplə] | ‘spear’ | 460 | 1280 |
| | [útə] | ‘saliva’ | 510 | 1570 |
| | [gbǎ] | ‘to borrow’ | 530 | 1290 |
| | [dǎ] | ‘to fish’ | 510 | 1450 |
| | [tʃəɣlə] | ‘to praise’ | 510 | 1360 |
| Average formant measurements for /ə/ | | | 504 | 1390 |
| /a/: | [ɛza] | ‘termite’ | 630 | 1260 |
| | [únà] | ‘type of trap’ | 660 | 1290 |
| | [jä] | ‘to wait’ | 700 | 1430 |
| | [bǎ] | ‘to come’ | 750 | 1470 |
| | [kpà] | ‘to carve wood’ | 740 | 1310 |
| Average formant measurements for /a/ | | | 696 | 1352 |
| /o/: | [íblō] | ‘large calabash’ | 300 | 950 |
| | [úkló] | ‘cold’ | 350 | 1110 |
| | [ùkpǎfò] | ‘courtyard’ | 330 | 950 |
| | [bǒ] | ‘to pull out’ | 340 | 800 |
| | [ɣlo] | ‘to operate’ | 330 | 720 |
| Average formant measurements for /o/ | | | 330 | 906 |
| /ɔ/: | [ífɔ] | ‘finger’ | 540 | 1040 |
| | [álɔ] | ‘face’ | 620 | 1090 |
| | [fɔ] | ‘to rot’ | 610 | 990 |
| | [kpɔ] | ‘to hit’ | 570 | 1070 |
| | [sɔ] | ‘to flower’ | 630 | 1110 |
| Average formant measurements for /ɔ/ | | | 594 | 1060 |
| /u/: | [émú] | ‘eye’ | 300 | 910 |
| | [ívú] | ‘raffia sack’ | 370 | 890 |
| | [kǔ] | ‘to die’ | 320 | 790 |
| | [wǔ] | ‘to crush’ | 340 | 710 |
| | [zù] | ‘to pound’ | 270 | 810 |
| Average formant measurements for /u/ | | | 320 | 822 |
| /ʊ/: | [ívu] | ‘sore’ | 380 | 660 |
| | [ótó] | ‘ear’ | 360 | 700 |
| | [kǔ] | ‘to sweep’ | 390 | 1000 |
| | [ékú] | ‘concrete thing’ | 330 | 660 |
| | [lǔ] | ‘to carry’ | 440 | 1030 |
| Average formant measurements for /ʊ/ | | | 380 | 810 |

| | word-initial position | | word-medial position |
|------|---|--|--|
| /i:/ | [ísí] 'yam' [ívú] 'raffia sack' [íblō] 'large calabash' [ìkpɛ̀] 'spear' [ínē] 'animal trail' | | [íðkū] 'tapped palm tree' [ejidzə] 'threshing floor' [tʃikə] 'to become' [lile] 'to drop' |
| /ɪ:/ | [ívlí] 'skin, paper' [ìkpɛ̀] 'bone' [ífɔ] 'finger' [ɪyà] 'pig' [ívɔ] 'sore' | | [íɲítí] 'fear' [áwíɲí] 'type of tool' [atíkè] 'traditional chalk' [kɪtɛ] 'to criticize' [wɪnɪ] 'to grow up' |
| /e:/ | [édí] 'palm nut' [émú] 'eye' [ékló] 'taboo' | | [ínédzə] 'sister' [íwétʃo] 'type of saucepan' [ídénū] 'a type of insect' [sétu] 'to be hard' [wele] 'to wash' |
| /ɛ:/ | [édì] 'joy' [ésé] 'abstract thing' [énō] 'filaria fly' [eza] 'termite' [ékú] 'concrete thing' | | [émɛkù] 'stomach' [àlena] 'build, condition' [èvlègba] 'type of plant' [vèɲí] 'to appear' [kpètɛ̀] 'to pick fruit' |
| /a:/ | [áɪ] 'village' [áje] 'fonio' [áló] 'face' [ága] 'poverty' [àwù] 'clothes' | | [álábó] 'cheek' [íwátʃɔ] 'cockroach' [òdàbà] 'eye lash' [dāwɪ] 'to be sweet' [wādí] 'to rise early' |
| /o:/ | [ojí] 'sale' [ohé] 'one born after twins' [ógu] 'type of bird' [ògló] 'rat' | | [ólókū] 'salt' [egboma] 'type of trap' [àbògò] 'type of hat' [kòsú] 'to look at' [kpólá] 'to spring a trap' |
| /ɔ:/ | [ófí] 'drink' [ósé] 'tail' [ótó] 'hole' [ótá] 'rabbit' [ónu] 'baggage' | | [úkɛnu] 'clan' [ùkpɛ̀fò] 'courtyard' [tʃəyɛ] 'to praise' [yèdú] 'to help someone' |

| | | | | |
|------|--------|----------------|----------|------------------|
| /u:/ | [úlí] | ‘granary’ | [étúlé] | ‘oven’ |
| | [úlu] | ‘wind’ | [údúnu] | ‘house’ |
| | [úsé] | ‘honey’ | [ótúdžō] | ‘sparrow hawk’ |
| | [útá] | ‘saliva’ | [dǔŋá] | ‘to be bitter’ |
| | [úkló] | ‘cold’ | [blūnē] | ‘to fly’ |
| /ɔ:/ | [ólí] | ‘waist’ | [ówólô] | ‘egg’ |
| | [ótó] | ‘ear’ | [èwòŋà] | ‘wild calabash’ |
| | [òdžò] | ‘mud’ | [ádukú] | ‘knee’ |
| | [ónà] | ‘type of trap’ | [dǔvlí] | ‘to be slippery’ |
| | [óvle] | ‘hunger’ | [dǔlól] | ‘to be heavy’ |

REFERENCES

- Afola-Amey, Ufualé Christine. 1995. “Étude géolinguistique du pays kposo.” Mémoire du Diplôme d’Etudes Approfondies, Université du Bénin.
- Anderson Coleen, Lois Dozeman, Deborah Hatfield, and Angela Kluge. 1992. “A sociolinguistic survey among the Akposso.” MS, Lomé, Togo: Summer Institute of Linguistics.
- Awedoba, A. K. 1992. “Light and heavy syllables in Kasem.” *Afrikanistische Arbeitspapiere* 30:135-153.
- Bole-Richard, Rémy. 1981. “Une autre approche de l’harmonie vocalique: le mot phonologique en Ega.” *Cahiers Ivoiriens de Recherche Linguistique* 10:31-51.
- Bonvini, Emilio. 1974. “Traits oppositionnels et traits contrastifs en Kasim.” Ph.D. dissertation, Institut National des Langues et Civilisations Orientales.
- Cahill, Mike. 1996. “ATR harmony in Kɔnni.” *Ohio State University Working Papers in Linguistics* 48:13-20.
- Casali, Roderic F. 1988. “Some phonological processes in Nawuri.” M. A. Thesis, University of Texas at Arlington.
- Casali, Roderic F. 1995. *Nawuri Phonology*. (Language Monographs no. 3.) Legon: Institute of African Studies, University of Ghana.

- Casali, Roderic F. 1997. "Cross-height vowel harmony in Ghanaian languages." MS, Ghana Institute of Linguistics, Literacy, and Bible Translation.
- Casali, Roderic F. 1998. Untitled database on vowel systems in African languages. Summer Institute of Linguistics.
- Dolphyne, Florence Abena. 1988. *The Akan (Twi-Fante) language: Its sound systems and tonal structure*. Accra: Ghana Universities Press.
- Dozeman, Lois. 1995a. "Elision vocalique en akposso." MS. Lomé, Togo: Summer Institute of Linguistics.
- Dozeman, Lois. 1995b. "Présentation sur l'orthographe et la segmentation en langue ikpɔsɔ." MS. Lomé, Togo: Summer Institute of Linguistics.
- Eklo, Alubue Amavi. 1987. "Le kposso de Tomegbe (Togo): phonologie, grammaire, textes, lexique kposso-français." Thèse de 3ème cycle, Université des langues et lettres de Grenoble.
- Jones, Peggy. 1987. "Collected field reports on the phonology of Dilo." (Collected language notes, 19.) Legon: Institute of African Studies, University of Ghana.
- Kaye, Jonathan D. 1982. "Harmony processes in Vata." In Harry van der Hulst & Norval Smith (eds.), *The Structure of Phonological Representations*, part 2. Dordrecht: Foris Publications. Pp. 385-452.
- Kaye, Jonathan, Jean Lowenstamm, and Jean-Roger Vergnaud. 1985. "The internal structure of phonological elements: A theory of charm and government." *Phonology Yearbook* 2:305-328.
- Kiparsky, Paul. 1985. "Some consequences of Lexical Phonology." *Phonology Yearbook* 2:83-138.
- Painter, Colin. 1970. *Gonja: A phonological and grammatical study*. (African series, 1.) Bloomington: Indiana University.
- Peacock, W., and J. Lear. 1997. "A Preliminary Phonology of Nkonya." MS. Ghana Institute of Linguistics, Literacy, and Bible Translation.
- Plunkett, Gray C. 1991. "The tone system of Foodo nouns." M. A. Thesis, University of North Dakota.
- Reinecke, B. 1972. *The Structure of the Nkonya Language, with texts and glossary*. Leipzig: Verlag Enzyklopaedie.

- Ring, J.A., and W. Kwami Numuley. n.d. "Writing vowels in Ikposo." MS. Ghana Institute of Linguistics, Literacy, and Bible Translation.
- Rongier, Jacques. 1989. "Dictionnaire akposso-français." MS. Lomé, Togo.
- Scholz, Hans-Jurgen. 1976. *Igbira phonology*. (Language Data Microfiche, African Series 7.) Huntington Beach, California: Summer Institute of Linguistics.
- Schuh, Russell. 1995. "Aspects of Avatime phonology." *Studies in African Linguistics* 24:31-67
- Snider, Keith L. 1984. "A generative phonology of Chumburung." MS. Ghana Institute of Linguistics, Literacy, and Bible Translation.
- Snider, Keith L. 1985. "Vowel coalescence across word boundaries in Chumburung." *Journal of West African Languages* XV, 1:3-13.
- Snider, Keith L. 1989a. "North Guang Comparative word list: Chumburung, Krachi, Nawuri, Gichode, Gonja." (Comparative African Wordlists, 4.) Legon: Institute of African Studies, University of Ghana.
- Snider, Keith L. 1989b. "The vowels of proto-Guang." *Journal of West African Languages* XIX, 2:29-50.
- Snider, Keith L. 1989c. "The consonants of proto-Guang." *Journal of West African Languages* XX, 1:3-26.
- Snider, Keith L. 1989d. "Vowel coalescence in Chumburung: An autosegmental analysis." *Lingua* 78:217-232.
- Snider, Keith L. 1990. "Tone in proto-Guang nouns." *African Languages and Cultures* 3, 1:87-105.
- Stewart, John M. 1971. "Niger-Congo, Kwa." In Thomas A. Sebeok (ed.), *Current Trends in Linguistics*, vol. 7. The Hague: Mouton. Pp. 179-212.
- Stewart, John M. 1989. "Kwa." In John Bendor-Samuel (ed.), *The Niger-Congo Languages*. Lanham, Maryland: University Press of America. Pp. 217-245.
- Tchagbale, Zakari. 1976. "Phonologie et tonologie du tem." Ph.D. dissertation, Université de la Sorbonne Nouvelle.
- Welmers, William E. 1973. *African Language Structures*. Berkeley: University of California Press.

Wolf, P. Franz. 1909. *Grammatik der Kpossosprache-Nord-Togo, West Africa*.
Fribourg: Anthropos Institut. Anthropos 4.

SIL
B.P. 57
Kara, Togo
coleen_anderson@sil.org

[Received May 1999;
accepted June 1999]