[ATR] Harmony in an Eleven Vowel Language: The Case of Anii

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1. Introduction and Research Question

Anii is a severely underdocumented Niger-Congo (probably Kwa) language spoken by approximately 45,900 people on the border between Togo and Benin in West Africa (Lewis 2009). It is a member of a relatively little-studied group of languages called the Ghana-Togo Mountain Languages. The data analyzed below is from the Gɪsɪda dialect of Anii, also known as the Bassila dialect, and was gathered during fieldwork in Bassila, Benin in Autumn 2009. This dialect of Anii has an eleven-phoneme vowel system with active vowel harmony processes based on the feature Advanced Tongue Root (hereafter [ATR]).

[ATR]-based vowel harmony has been documented for many African languages (cf. Archangeli and Pulleyblank 1994, Casali 2000, 2003, 2008, Clements 2000, Starwalt 2008). A typical example of this type of harmony, taken from Anii, is in (1) below. Here, the same affix, in this case a noun-class marker (bolded), contains a different vowel depending on the [ATR] quality of the root to which it is attached. In (1a), the marker is attached to a root with a [+ATR] vowel, and surfaces in its [+ATR] variant, and in (1b) it is attached to a root with a [-ATR] vowel and surfaces in its [-ATR] variant:

(1) a. [**gu-**jó][1] 'tree'
     b. [**gʊ-**já] 'market'

The majority of languages with [ATR] harmony that have been described thus far have either seven or nine-vowel phonemes[2] (Casali 2000, 2003, Starwalt 2008). Ten-vowel languages are known as well, but are rarer (Clements 2000, Casali 2000, 2008). There are very few African languages with [ATR] harmony (less than 5% of the languages in Casali's (2000) survey of around 300 African languages with [ATR] harmony) that are known to have more than ten vowels.

This paper describes the phonology of the unusual eleven-vowel system of [ATR]-based vowel harmony found in Anii, including the possible historical origins of the high-central vowel /ɨ/, and discussion of how /ɨ/ in Anii is different from central vowels in other African languages with [ATR] harmony. In addition, the implications of the Anii vowel system for the typology and historical reconstruction of African languages with [ATR]-based vowel harmony will be explored.

1.1. Typological generalizations about [ATR]-harmony languages

In languages that exhibit [ATR] harmony, there is one set of vowels pronounced with the root of the tongue advanced (often also described as being tense, or pronounced with expanded pharynx), i.e.

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[1] Note that tone markings throughout this paper are tentative, as a tonal analysis of Anii is still in process. H tone is marked with an accent, L tone by no accent.
[2] Note that when categorizing the language here, we focus only on phonemes, not counting allophonic variation, though it is common for /a/ (for example) to have an allophonic [+ATR] variant in many languages.

[+ATR] vowels. There is also a second set of vowels pronounced without this feature, i.e. [-ATR] vowels. There are certain contexts, usually in affixes (as in (1) above), where the contrast between pairs of [+ATR] and [-ATR] vowels (of roughly the same height and backness) is neutralized, with the vowel of the affix taking on the [ATR] quality of the vowel(s) in the root to which the affix is attached.

In ten-vowel languages such as Diola (Sapir 1965), all the vowels of the language participate in the harmony system, so there are five harmonic pairs (generally /i,ɪ,e,ɛ,ə,a,o,ɔ,u,ʊ/). In the more common seven-and nine-vowel systems, there are one or more vowels that are not part of a harmonic pair, called here non-participatory vowels. The most common non-participatory vowel is /a/, and both acoustic and articulatory explanations have been given for this fact. For example, it has been claimed that the reason /a/ does not have a [+ATR] counterpart in many languages is that vowel quality differences in the mid-central region of the vowel space (where the [+ATR] counterpart of /a/ is found in ten-vowel languages) are difficult to perceive (cf. Stewart 1971, Hall and Creider 1998), or that there is articulatory difficulty in advancing the tongue root when the tongue body is low (cf. Stewart 1971, Archangeli and Pulleyblank 1994) to produce a low [+ATR] vowel. Thus, the vowel inventory for nine-vowel languages is generally /i,ɪ,e,ɛ,a,o,ɔ,u,ʊ/, and seven-vowel languages have one of two inventories, i.e. /i,e,ɛ,a,ɔ,o,u/ or /i,ɪ,ɛ,a,ɔ,ʊ,u/ (Casali 2008).

2. Anii Data

Anii has a very robust system of vowel harmony which applies to almost all affixes in the language. There are five harmonizing pairs including /a/ and /ə/, where /a/ is a [-ATR] vowel whose [+ATR] counterpart is a mid-central vowel, /ə/. There is also an eleventh vowel, a relatively high central vowel, /ɨ/. /ɨ/ is [-ATR], and only appears in words where the surrounding vowels are [-ATR], but it does not have a [+ATR] counterpart, nor does it have a [+ATR] allophone.

2.1. Vowel Phonemes in Anii

As mentioned above, most Anii vowels come in pairs, one [+ATR] and one [-ATR], except that there are two [-ATR] central vowels, high and low, and only one [+ATR] central vowel, which is mid.[3] The inventory of vowel phonemes in Anii is given in (2)[4]:

(2)   +ATR   -ATR
    /i/   /u/   /ɪ/   /ɨ/   /ʊ/
    /e/   /ə/   /o/   /ɛ/   /ɔ/
                           /a/

Vowel length is contrastive in at least some vowels in Anii, most clearly with /a/ (e.g. [da], 'be there' versus [daa], 'since'), but there are complications in the analysis of vowel length for many of the vowels. For this reason, this paper focuses only on the short vowels of Gɪsɪda Anii, since vowel length does not affect the harmony system described here. In (3) below, the short vowels are given with their harmonic counterparts (/ɨ/ is not included in (3) because it has no [+ATR] counterpart):

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[3] The transcription used here may be slightly too high, as this vowel is phonetically a bit lower than the canonical [ɨ]. However, this transcription was chosen because it captures the fact that this vowel is higher than [ə], and also is a reasonably well-known symbol.

[4] For interested readers, the basic consonant inventory of Gɪsɪda Anii is given here. Note that for some speakers, /ʧ/ has the allophone [ts] before non-low central vowels and /h/ is a marginal phoneme:

	labial	alveolar	alveo-palatal	velar/ post-palatal	labio-velar
stops	/p/ /b/	/t/ /d/		/k/ /g/	/kp/ /gb/
affricates			/ʧ/ /ʤ/		
fricatives	/f/	/s/	/ʃ/	/h/	
nasals	/m/	/n/	/ɲ/	/ŋ/	/ŋm/
glides			/j/		/w/
lateral			/l/		
liquid		/r/			

(3)

	+ATR	-ATR
High front:	/i/	/ɪ/
Mid front:	/e/	/ɛ/
Central:	/ə/	/a/
High back:	/u/	/ʊ/
Mid back:	/o/	/ɔ/

While acoustic measurements of these vowels have not yet been undertaken, I note here that, as in many African languages (cf Casali 2008), the [+ATR] mid vowels in Gɪsɪda Anii are acoustically similar to the [-ATR] high vowels, and the distinction between /e/ and /ɪ/ and /o/ and /ʊ/ can be difficult for non-Anii speakers to hear.

All eleven Anii vowels are, however, phonemic, though /ɨ/ appears to be a relatively new phoneme, as will be discussed below. There are minimal (or near-minimal) pairs between all the harmonizing vowel pairs, as shown in (4):

(4) a. [ri]   'to trap'   [rɪ]   'to dance/grill'
        [pi]   'to break/crush'   [pɪ]   'to come'
    b. [né]   'to detest/hate strongly' [nέ]   'to lend/pass'
        [tʃedé]   'to crumble'   [tʃɛdɛ]   'to divide kola nuts'
    c. [wɔ́]   'to cook meat'   [wá]   'to meet'
        [də]   'to jump over'   [da]   'to be there'
    d. [du]   'to sow'   [dʊ]   'to put/place'
        [fum]   'to bury'   [fʊŋ]   'to cultivate'
    e. [fodó]   'to doff (take off)'   [fɔrɔ]   'to mix/knead in'
        [to]   'to give'   [tɔ́]   'to last'

Additionally, there are minimal pairs between the two non-low central vowels, as in (5a), and between /ɨ/ and /a/, as in (5b):

(5) a. [pɨl]   'to cook'   [pəl]   'to look along'
        [ŋkɨ́ŋ]   'behind'   [ŋkɔ́ŋ]   'there'
    b. [sɨlá]   'to approach'   [salá]   'to greet'
        [pɨra]   'to become'   [para]   'to glue/stick'

Thus, Anii can be seen to have eleven vowel phonemes, five [+ATR] and six [-ATR].

2.2. Anii Vowel Harmony

All non-compound words in Anii show a consistent [ATR] value in all of their vowels, including affixes. For example, noun-class markers have two forms, one that surfaces when attached to roots with [-ATR] vowels and one that surfaces when attached to roots with [+ATR] vowels. This is illustrated in (6). The noun-class markers are bolded:

(6)

		[-ATR]		[+ATR]	
a.	Class A[5]:	none known		[**u**-pi]	'child'
b.	Class Ǝ:	[**a**-bɔrí]	'sheep/animal'	[**ə**-kutú]	'orange'
c.	Class C:	[**ga**-fɪlí]	'fish (sg.)'	[**gə**-dú]	'place'
d.	Class Đ:	[**gɪ**-bɔ]	'very short shorts'	[**gi**-dʒe]	'yam'
e.	Class E:	[**ʊ**-dɔ]	'neck'	[**u**-tʃine]	'heart/courage'
f.	Class Ɛ:	[**gʊ**-tɔ]	'ear'	[**gu**-jó]	'tree'

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[5] The twelve Anii noun classes are designated with letters from the Anii alphabet in the absence of an applicable convention for noun-class categorization in Kwa languages (see Zaske 2009). Class B has no noun-class prefix and Class F has no vowel (the noun-class marker is a nasal consonant), so they are not mentioned further here.

g.	Class G/Ʊ[6]:	[**bʊ**-tʊŋa]	'salt'	[**bu**-tó]	'water'
h.	Class T[7]:	[**a**-ɲɛ]	'hands'	[**ə**-kú]	'rooms/huts'
i.	Class U:	[**ɪ**-lɔ]	'strings/cords'	[**i**-ʤe]	'yams'
j.	Class W:	[**ɪ**-tʊŋa]	'guinea fowl (pl)'	[**i**-bú]	'snakes'
k.	Class Y:	[**ba**-fʊmɪ]	'farmers'	[**bə**-pi]	'children'

Note that none of the noun-class markers contain /e/, /ɛ/, /o/, /ɔ/ or /ɨ/, which occur in nouns only in roots. When /ɨ/ does occur in a word, all other vowels in that word will be [-ATR]:

(7) [gʊ-pɨrá] 'arm'
     [gɪ-dɔmpɨlá] 'slavery/captivity'
     [bʊ-kɨma] 'backs'
     [ɪ-fɨtɨla] 'lamps'

/ɨ/ can also be the only vowel in a root, in which case it takes [-ATR] affixes, as seen in the forms of [gɨ]/[gɪ] (the personal pronoun meaning 'we') in the following phrases:

(8) a. [**gɨ**-pɨl] 'we cooked'
     [**gɨ**-tsɨŋ] 'we are good'
     [**gɨ**-rɨŋ] 'we twisted'
  b. [**gɨ**-pəl] 'we looked along'
     [**gɨ**-tsəŋ] 'we stung'
     [**gɨ**-rəŋ] 'we closed'

Noun class agreement prefixes on adjectives also exhibit [ATR] harmony in Anii. That is, the [ATR] specification of the vowel in the noun-class agreement on the adjective is influenced by the vowels in the adjective root. The vowels of the noun-class markers and agreement markers are bolded in (10):

(10) a. [g**i**-ʤe g**i**-tolo] 'uncooked yam'
     yam uncooked
  b. [g**i**-ʤe g**ɪ**-fɔlí] 'new yam'
     yam new
  c. [g**ɪ**-ʤaŋkáɪ g**i**-tolo] 'uncooked pepper'
     pepper uncooked
  d. [g**ɪ**-ʤaŋkáɪ g**ɪ**-fɔlí] 'new pepper'
     pepper new

Grammatical particles in the verb phrase also exhibit [ATR] harmony. There is obligatory noun-class agreement between the subject and the verb, coming at the beginning of the verb phrase. Subject pronouns (as in (8) above), agreement markers, and the imperfective marker [ti]/[tɪ][8], show [ATR] harmony, surfacing with the same [ATR] quality as the vowels in the verb root. The verbal morphology exhibiting [ATR] harmony is bolded in (10) below. The verb roots are [pɛmpɛŋɛ], 'to clean' and [kide], 'to look at':

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[6] These two classes have been kept apart in the past because Class G contains singular objects or mass nouns and Class Ʊ plural objects, but no linguistic reason is seen now to continue that separation. Originally, the 'singular' classes were given letters from the beginning of the alphabet and the 'plural' classes letters from the end of the alphabet (Zaske 2009)
[7] Classes Ǝ and T, and U and W respectively have the same noun-class markers but they trigger different agreement patterns, and are so kept as separate classes.
[8] Research is ongoing as to whether any other TAM markers also exhibit [ATR] harmony (some at least do not)

(11) a. bə-pi   **ba-tɪ-**pɛmpɛŋɛ   ŋ-kú
        cl.Y.child AGR.CL.A.IMPF.clean   CL.Ɛ.room[9]
        The children are cleaning the room
   b. bə-pi   **bə-ti-**kidé   ή-kú
        CL.Y.child AGR.CL.A.IMPF.look.at CL.Ɛ.room
        The children are looking at the room

Thus far, it has been shown that nominal, adjectival and verbal prefixes in Anii are affected by [ATR] harmony. In addition, at least one suffix, a relativizer, shows similar effects:

(12) a. [gə-dú]   'place'   [gə-dú-**î**]   'place where'
        [u-ʧĭne] 'courage'   [u-ʧĭne-**î**] 'courage which'
        [bu-tó]   'water'   [bu-tó-**î**]   'water which'
   b. [a-rɛ]   'man'   [a-rɛ-**î**]   'man who'
        [gʊ-tɔ]   'ear'   [gʊ-tɔ-**î**]   'ear which'
        [a-ɲɛ́]   'hands'   [a-ɲɛ́-**î**]   'hands which'

There are also nominalizing circumfixes that display [ATR] harmony, of which an example is given in (13):

(13) a. [faŋá]   'to teach'   [**ʊ**faŋ**ʊ́**]   'the act of teaching'
        [fʊba]   'to change'   [**ʊ**fʊb**ʊ**]   'the act of changing'
   b. [boŋó]   'to finish'   [**u**boŋ**ú**]   'the end'
        [toŋo]   'to transport' [**u**toŋ**u**]   'transportation'

As mentioned above, there are some words in Anii that contain both [+ATR] and [-ATR] vowels, namely compound nouns. The noun-class markers of compound nouns exhibit harmony with the adjacent root, but the noun roots in compounds do not change their [ATR] specification, though mid vowels are raised in compounds, as in (14a):

(14) a. [ganɔ́]   'mouth'
        [gətó]   'stream'
        [gətúnɔ́]   'beach/bank of a river'
   b. [upi]   'child'
        [mpá]   'village'
        [ʊpapí]   'a native'

2.3. Summary of [ATR] harmony in Anii

[ATR] harmony in Anii is found in both suffixes and prefixes, and on nouns, adjectives and verbs. High vowels and low vowels in Anii undergo [ATR] harmony. Mid vowels other than /ə/ never appear in harmonizing affixes, but each mid vowel has a consistent [ATR] quality, with /e/ and /o/ being consistently [+ATR] and /ɛ/ and /ɔ/ consistently [-ATR]. The vowel /ɨ/ also does not appear in harmonizing affixes, but is consistently [-ATR]. Among the Anii vowels, /ɨ/ alone is not part of a [+ATR]/[-ATR] pair.

3. The central vowels and /a/

Anii differs from other languages with [ATR] harmony mainly in the behavior of /a/ and the two central vowels /ə/ and /ɨ/. The function of these vowels in Anii as compared with other African languages with [ATR] harmony is discussed in this section.

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[9] Abbreviations used in the glosses: *CL* = noun-class (followed by the letter of the noun-class), *AGR* = agreement, *IMPF* = imperfective marker.

3.1. /a/ in seven- and nine-vowel languages

The status of /a/ in the [ATR] harmony systems of seven- and nine-vowel African languages is quite varied. In most such languages, /a/ is a [-ATR] vowel (triggering [-ATR] in harmonizing affixes) with no harmonic counterpart. Often, however, /a/ has a [+ATR] allophone in [+ATR] words (cf. Casali 2008). Possibilities for the [+ATR] allophone include [æ] (Gwa Nmle, Obeng 1995) or some kind of mid-central vowel (e.g. [ʌ] in Maiak (Hall and Creider 1998), [ɜ] in Abe (Stewart 1971), or [ɤ] in Mabaan (Hall and Creider 1998)). Also, the [+ATR] allophone of /a/ could be [e] (in many languages, especially in West Africa, Casali 2008), [o] (many languages, especially in East Africa, Casali 2008), or even [ɔ] (e.g. Ateso, Hall and Creider 1998)). /a/ is either restricted to [-ATR] words, or can occur in words with either kind of vowel (is neutral).

3.2. /a/ and /ə/ in ten- and eleven-vowel languages

In languages with ten vowel phonemes, /a/ has a phonemic [+ATR] counterpart which is a central vowel, sometimes transcribed as /ə/ (cf. Diola-Fogny, Sapir 1965), and sometimes as /ɨ/ (cf. Bongo, Kilpatrick 1985). Ten-vowel systems are generally straightforward, with every vowel having a harmonic counterpart (Casali 2008).

Eleven-vowel systems are much rarer and more varied, but some representative examples are discussed here. Firstly, in Baka (Parker 1985), a Nilo-Saharan language of Sudan, eleven vowels have been reported. The [+ATR] counterpart of /a/ in Baka is transcribed as /ə/, and the eleventh vowel, /ɨ/, is claimed to be neutral, appearing in both [+ATR] and [-ATR] words without restriction. /ɨ/ in Baka is also claimed to be the result of a general process of vowel reduction, appearing in what Parker (1985) refers to as unstressed syllables. Baka /ɨ/ can never be the only vowel in a word.

Anii /ɨ/ is different from the non-participatory vowel (/ɨ/) in Baka on several counts. Firstly, /ɨ/ in Anii is consistently [-ATR], rather than neutral. Secondly, in Anii, /ɨ/ can be the only vowel in a word, as illustrated below in (14), so it is not a reduced vowel in the same way the /ɨ/ in Baka is:

(15)　　[fɨl]　　'to pass/leave'
　　　　[kɨ]　　'to hit'

The dialects of Boni, a Cushitic language of Kenya and Somalia (Heine 1980), appear to have a system very like that in Baka. The Jara and Kilii dialects of Boni are claimed by Heine (1980) to have eleven vowel phonemes, but another scholar, Sasse (1979, quoted in Heine 1980), had claimed that the /ə/ in Boni is an allophone of the [-ATR] high front vowel, transcribed as [ɪ] by Heine (1980). If Sasse is correct, the derivation of /ə/ from a [-ATR] high front vowel is similar to what may have occurred in Anii (see section 3.3 below). Heine (1980), while claiming that /ə/ is a phoneme in its own right, does note that in the Boni dialects, the /ə/ is much shorter than any other vowel, and is frequently devoiced and/or deleted, and can assimilate to surrounding vowels. Such characteristics have not yet been noted for Anii /ɨ/.

In Lama (Ourso 1989b), a Gur language which is spoken very close to the Anii area, there are also eleven phonemic vowels, but in Lama, /a/ is the non-participatory (and neutral) vowel, while /ə/ is the [+ATR] counterpart of another central vowel, /ɜ/. Ourso (1989a, b) also claims that the /a/ in Lama has a [+ATR] allophone, [ʌ], in the environment of [+ATR] vowels.

Anii /ɨ/ and /a/ are different from their counterparts in Lama, since in Anii, /ɨ/ does not have a harmonic counterpart but /a/ does. Despite the lack of a counterpart, however, /ɨ/ in Anii cannot be considered neutral in the same sense that /a/ is in many languages with [ATR] harmony (including Lama), since in Anii, /ɨ/ only occurs in [-ATR] words, and does not have a [+ATR] allophone.

Kanembu, a Nilo-Saharan language spoken in Chad and Niger (Roberts 1994, based on data from Jouannet 1982) has an inventory similar to that of Lama, though the central vowels in Kanembu are transcribed with [ʌ] ([+ATR]) and [ə] ([-ATR]). The non-participatory vowel in Kanembu, as in Lama, is /a/, not a central vowel as in Anii.

Thus, of the four eleven-vowel languages exhibiting [ATR] harmony found in Casali's (2000) database, there appear to be two basic types. In languages such as Baka and Boni, there is a mid-

central vowel that is non-participatory in the harmony system, but this vowel, unlike Anii /ɨ/, is neutral and exhibits characteristics of being a synchronic phonetic reduction of one or more of the other vowels in the system. In Lama and Kanembu, however, the central vowels are part of a harmonic pair, and /a/ is the non-participatory vowel. There are, as far as I have found, no other languages have been reported with a vowel system like that found in Anii, though it is possible that the Anii system was once more similar to that found in Baka and Boni, as will be discussed below.

3.3. Speculation on the historical origin of the Anii /ə/

Given the typology of languages with [ATR] harmony and the behavior of /ɨ/, /ə/ and /a/ in Anii, it is likely that the eleven-vowel system of Anii is the result of a phonemic split, the early stages of which could possibly have been similar to the situation described in the Boni dialects (Heine 1980). This section presents the available evidence from within Anii supporting this hypothesis.

While /ɨ/ is a phoneme in modern Bassila Anii, its distribution suggests it may have originated as an allophone of /ɪ/ before liquids and nasals. Firstly, in multi-syllable words, /ɨ/ almost always appears in the pattern /ɨla/, /ɨNa/[10] or /ɨra/ (e.g. [gɪdɔmpɨla], 'slavery', [asɨna], 'dog', or [gakɨma], 'back', [atsɨra], 'bushrat'). Additionally, in CVC words, /ɨ/ (and all other vowels) appears but /ɪ/ does not (the only permitted final consonants are liquids and nasals), as in (16). Thus, /ɨ/ occurs most commonly before liquids and nasals in Bassila Anii:

(16) [pɨl]   'to cook'
       [tsɨŋ]   'to be good'
       [ɲem]   'to drink'
       [boŋ]   'to be finished'
       [fʊŋ]   'to cultivate'
       [kul]   'to pound'   '
       [ʃɛr]   'to sweep'
       [maŋ]   'to mix'
       *[pɪl], *[tsɪŋ], *[ɲɪm], etc.

In other dialects of Anii, some of the words that contain /ɨ/ in Bassila Anii have /ɪ/ instead. For example, [asɪna] was given as the word for 'dog' in at least seven Anii villages during a short dialect survey I conducted in 2006. The word for 'dog' in Bassila Anii is [asɨna]. Thus, it is possible that historically, Bassila Anii had /ɪ/ where it now has /ɨ/. However, in modern Bassila Anii, there are some minimal and near-minimal pairs between /ɨ/ and /ɪ/, as shown in (17):

(17) a. [tʃɨ]   'to build   [tʃɪ]   'to wash'
      b. [sɨ]   'to scar   [ʃɪ]   'to buy'[11]
      c. [tɨ]   'future marker' [tɪ]   'to put down'
      d. [ga-tɨna]   'land/earth'   [ga-tɪ na...] 'it (class C) put down and...'

(17a) is of especial note here, since [ts] occurs as an allophone of /tʃ/ for some speakers, meaning that 'to build' is pronounced [tsɨ] by those speakers. This allophone of /tʃ/, however, only occurs before /ə/ and /ɨ/, meaning that /ɨ/ and /ɪ/ condition different allophones of this phoneme, which could provide further evidence that /ɨ/ and /ɪ/ are now different phonemes.

Given the evidence above, I posit that /ɨ/ in Anii originated as a reduction of /ɪ/ before nasals and liquids, which explains why /ɨ/ is [-ATR] (since /ɪ/ is [-ATR]). A synchronic analysis of Bassila Anii, however, must still posit that /ɨ/ and /ɪ/ are separate phonemes since both sounds appear in monosyllabic words with the same or similar phonetic environments and the same tone. Also, /ɨ/ and /ɪ/ behave differently with regard to conditioning allophones of the phoneme /tʃ/ and /ɨ/ is no longer

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[10] Here, N means any nasal consonant.
[11] There is some evidence that [ʃ] is a new, possibly marginal, phoneme in Bassila Anii, since it does not exist in most other dialects, and in Bassila is present mostly in borrowed words or before front vowels.

completely limited to environments preceding liquids or nasals (cf. [fitíla], 'lamp', [sɨba], 'to begin', and [sɨ], 'to scar). Additionally, native speakers of this dialect are quite resistant to writing /ɨ/ and /ɪ/ with the same symbol, which, while not phonological evidence, is suggestive that native speakers perceive these two sounds as different phonemes.

4. Conclusions and Typological Implications

As has been shown here, Bassila Anii has an unusual eleven-vowel system of [ATR]-based harmony where the non-participatory vowel is a mid vowel, rather than a low vowel. This system appears to be the result of a historic phonemic split. It is possible that this split is related to the phenomenon of 'weak vowels', i.e. mid-central vowels that have been shown to occur only before liquids and sometimes nasals in several Kwa languages of Côte d'Ivoire (Leben 1999), but in Anii /ɨ/ no longer appears only in these environments.

It has been argued (cf. Stewart 1971, Hall and Creider, 1998) that /a/ is so often non-participatory in vowel systems with [ATR] harmony because central [+ATR] vowels are hard to either hear or produce. Heine (1980) did not consider the possibility of a split in his historical proposals regarding the Boni dialects, but instead proposed a that Proto-Boni had twelve vowels (six harmonizing pairs), and that the current eleven vowels found in the daughter dialects are the result of a merger. This may, in fact, be the case for Boni, though more data than the brief sketches in Heine (1980) would be needed to confirm or deny this hypothesis.

In Bassila Anii, however, it appears a new central vowel phoneme has been added where many scholars would predict only phoneme loss (cf. Polgárdi 1998 for a theoretical analysis that makes a prediction along these lines). The facts of Anii can shed light on the origins of vowel systems with more than 10 vowels, given relatively common proposals that various Proto-languages in Africa had ten-vowel systems with [ATR] harmony (cf. Stewart 1971 for Proto-Niger-Congo, Armstrong 1985 for Proto-Kwa). Thus, the modern Gɪsɪda Anii vowel system suggest that splits, as well as mergers, can take place in the vowel inventory of [ATR] harmony languages, and this fact should be taken into account in reconstructing the history of [ATR] harmony (and vowel systems in general) in African languages.

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