

Studies in African Linguistics

Editor

David Odden

Associate Editors

G. Tucker Childs (Portland State University)
Bruce Connell (York University)
Katherine Demuth (Brown University)
Omar Ka (University of Maryland, Baltimore)
Ronald P. Schaefer (Southern Illinois University)
John V. Singler (New York University)

Publisher

The Department of Linguistics and the Center for African Studies
Ohio State University, Columbus, Ohio

Cover Design

Tina Messmer

Journal webpage: <http://ling.osu.edu/sal>

Studies in African Linguistics is published twice a year. Occasional supplements are published at irregular intervals and are available to current subscribers at reduced rates. It is printed and bound in the United States by Western Newspaper Publishing Co., Inc., Indianapolis, Indiana.

Contributions to the journal should be sent to: The Editor, *Studies in African Linguistics*, Department of Linguistics, 222 Oxley Hall, Ohio State University, Columbus, OH 43210. Contributors please refer to "Guidelines for Contributors" inside the back cover.

Correspondence concerning subscriptions or other business should be sent to: Managing Editor, *Studies in African Linguistics*, Department of Linguistics, 222 Oxley Hall, Ohio State University, Columbus, OH 43210. Subscription rates are the following:

	<i>North America</i>	<i>Elsewhere</i>
Individuals	\$25.00 per year	\$33.00 per year
Institutions:	\$50.00 per year	\$60.00 per year
Single issue:	one half the yearly rate	
Supplements:	variable price depending on supplement	

Make checks payable to **Studies in African Linguistics**.

Volume 33, Number 1 • 2004

Copyright © 2004

by Studies in African Linguistics, Ohio State University

ISSN 00390-3533

TABLE OF CONTENTS

Michael Cahill	Tone polarity in Kɔnni nouns	1
Ursula Drolc	A diachronic analysis of Ndut vowel harmony	35
Flavien Gbeto	Esquisse de la tonologie synchronique du wemɛgbe, dialecte gbe du sud-bénin	65
Rose Letsholo	Clausal and DP-internal agreement in Ikalanga	91
<i>Publications received</i>		129
<i>Upcoming meetings on African languages/linguistics</i>		131
<i>Guidelines for contributors</i>		inside back cover

TONE POLARITY IN KŌNNI NOUNS

Michael Cahill
SIL International

Since Kenstowicz *et al*'s analysis of Mooré (1988), a widespread view is that tone polarity does not exist; apparent polarity is actually dissimilation. This paper shows that an OCP-based dissimilation analysis cannot account for the full range of Kŏnni data, and presents a morpheme-specific **POLAR** constraint referring to the Noun Class 1 plural suffix. **POLAR** is satisfied in two or possibly three ways: the polar tone may be inserted, be already present in the input, or possibly spread from the definite suffix. The polar tone is not always on the word's edge, and for some words may even be floating. The analysis here thus supports the assertion of Newman (1995) that tone polarity is a natural pattern of language.

1. Introduction to Kŏnni Tone

Tone polarity is a pattern in which a tone-bearing unit, generally in an affix, shows a tonal value opposite to that immediately adjacent to it. Since the analysis of Mooré and Lama by Kenstowicz, Nikiema & Ourso (1988), it has been often assumed that tone polarity is an epiphenomenon due to dissimilation of a particular underlying tone, usually High. In this paper, I show the tone polarity of the Noun Class 1 suffix in Kŏnni cannot be analyzed as this type of dissimilation.

The remainder of this section will lay out general observations about tonal patterns in Kŏnni, including the reasons for choosing the representations used in the paper. Section 2 reviews previous analyses of polar tone in related languages, particularly the influential Kenstowicz, Nikiema, and Ourso paper. Section 3 presents the analysis of Kŏnni polarity in terms of Optimality Theory, first reviewing general tonal constraints used in Kŏnni, then analyzing in some detail the polar-toned plural suffix of Noun Class 1, and examining alternative hypotheses. Finally, Section 4 offers some concluding remarks.

1.1 Basic facts of Kɔnni. Kɔnni is a Gur language, Central Oti-Volta branch, spoken in the Northern Region of Ghana by about 2500 people. Transcriptions of segmental material in this paper are phonemic. Long vowels are transcribed as sequences of two identical vowels.

Consonantal and vocalic phonemic inventories are given below. There is also a length contrast in vowels, and ATR harmony within words. Long mid vowels diphthongize, thus the vowel “sequences” [ie, ia, uo, ua] are surface manifestations of /ee, ee, oo, ɔɔ/, contained in a single syllable.

(1) *Kɔnni consonants*

	<i>labial</i>	<i>alveolar</i>	<i>palatal</i>	<i>velar</i>	<i>labial- velar</i>	<i>glottal</i>
stops	p, b	t, d		k, g	kp, gb	
affricates			tʃ, dʒ			
fricatives	f, v	s, z				h
liquids		l, r				
nasals	m	n	ɲ	ŋ	ŋm	
glides			j		w	

(2) *Kɔnni vowels*

	+ATR		-ATR	
high	i	u	ɪ	ʊ
mid	e	o	ɛ	ɔ
low			a	

Kɔnni’s level tones are transcribed as High (á), Low (à), and downstepped High (’á). These can combined to form one rising tone (Low to High) and two falling tones (High to Low, and High to downstepped High). The H¹H contour on a single TBU reported here is rare in the literature.¹ These are illustrated in the forms below, with syllables illustrating the tone type bolded. The gaps with the

¹ I am only aware of three published cases. Essien (1990:55) briefly notes for Ibibio a “type of falling tone consist[ing] of a sequence of high and downstepped tones rather than high and low tones”. Casali (1995, fn. 22) mentions the verb ‘walk’ is [ná’á] in the incomplete for Nawuri. Finally, Bakweri (Hawkinson 1986, Kagaya 1992) is reported to have such. (Thanks to David Odden for pointing out the latter references.) It remains to be seen how many other languages of West Africa have this feature. What seems unusual at present may turn out to be merely underreported.

CV pattern are systemic; the falling (HL) tone is the only contour that appears on CV syllables. For more details on contour tones and their relation to TBU duration, see Zhang (2001).

(3)	CV	CVV	CVN	CVVN
L	kà 'it'	dàà gbúgín 'stump'	dà mpàlí 'dog'	dù ùmbú 'the horse'
H	ká 'not'	zú útjásín 'comb'	wín 'face mark'	kpá án 'oil'
LH	—	bù á 'child'	tǎ n 'stone'	kpà án 'back of head'
H ¹ H	—	ù tá 'á 'his sister'	kó 'ín 'fallow area'	kpá 'án 'guinea fowl'
HL	kú ú bâ 'bowl'	lí à 'daughter'	á gbîn 'to tie'	tʃí àn 'chair'

The following generalisations may be made about the *Kɔnni* tone system:

- (4) a. The syllable is the tone-bearing unit. (The most common syllable types are CV, CVV, CVN, CVVN; V occurs only in various particles.) Evidence for this, besides the distributions in (3) which are described in terms of syllables, is that, in spreading and other processes, the tone of the whole syllable is affected, not just the tone of a mora. Other Gur languages have also been analyzed with the syllable as TBU (Kenstowicz, Nikiema & Ourso 1988, Antilla & Bodomo 1996, Crouch 1985, and Hyman 1993).
- b. There is no HLH sequence phonetically within a word. When one would be created by concatenation of morphemes, the second H spreads, resulting in H!HH surface pattern, as seen in Sec. 1.3.
- c. Contour tones are only found on the final syllable of a word, as seen in (3).

- d. A contour in Kɔnni has a maximum of two pitch levels: HL, LH, or H¹H.
- e. Underlying High tones do not remain floating, but Low tones can float between Highs, causing downstep. This will be seen in several places in the course of the paper.

1.2 High-toned nominal suffixes. The table below contains examples from all noun classes. These classes are defined by the forms of the definite articles and plurals they take. The most obvious generalization to be noted is that an overwhelming majority of nouns, whether singulars or plurals, definite or indefinite, end with a High tone, whether this is a downstepped High or non-downstepped High (the exceptions are some plurals in Classes 1 and 3, and a very few singulars in Class 3).²

(5)	Class	Singular	Sg. Def.	Plural	Pl.+ Def.	
	NC1	bìs-íŋ	bìs-ìrí	bìs-á	bìs-á-há	‘breast’
	NC2	gbàá-ŋ	gbàà-kú	gbàà-tí	gbàà-tí-tí	‘courtyard’
	NC3	nánjú-ŋ	nánjú-ká	nánjú-sí	nánjú-sí-sí	‘fly’
	NC4	nǎ-ŋ	nòm-bú	nòn-tí	nòn-tí-tí	‘meat’
	NC5	tʃùá	tʃùà-wá	tʃùà-líŋ	tʃùà-lì-bá	‘father’

I conclude, then, that nominal suffixes (except for the plural /-A/ in NC1) are lexically High-toned. These include the singular indefinite suffix /-ŋ/, the singular definite suffixes /-rí/, /-kú/, /-ká/, /-bú/, /-wá/, the plural suffixes /-há/, /-tí/, /-sí/, /-líŋ/, and the plural definite suffixes /-tí/, /-sí/, /-bá/. (Capital letters indicate the morpheme is not lexically specified for ATR value, and the [ɪ] appearing in the singular suffixes of NC1 is epenthetic.) More evidence supporting the notion that the singular suffix [-ŋ] has a High tone in underlying representation can be seen from the fact that several singular nouns without [-ŋ], such as [líà] ‘daughter’ from NC5, end in a Low tone, while every noun ending in [-ŋ] also ends in a High tone. The plural suffixes of NC1, which manifest a tone opposite to the previous stem tone, will be examined below, but all other inflectional noun suffixes have a High tone.

² No attempt has been made to relate the Kɔnni noun classes to the larger picture of Niger-Congo; the numbering of these classes here is arbitrary.

1.3 Downstep as floating Low tone. In some languages, downstep can be shown to be the result of the adjoining of two High tones, that is, two morphemes that are independently known to have High tones, when abutted, are phonetically H¹H, for example KiShambaa (Odden 1982), Supyire (Carlson 1983), and Namwanga (Bickmore 2000). In many other languages, however, a downstep can be traced to a floating Low tone between two associated High tones. Kɔnni is of the latter type. Consider the forms below.

- (6) a. pón-íŋ, pón-ké ‘tree; the tree (sp.)’
 b. zàsíŋ, ù zà’síŋ ‘fish; his/her fish’

As pointed out in the previous section, the [-ŋ] singular suffix has a High tone. In the forms [pón-ké] ‘the tree (sp.)’ the stem [pón-] sponsors a High tone, with the Highs of the second syllables coming from the suffixes [-ŋ] (with an epenthetic *i*) and [-ké]. (Cf. [bùníŋ], [bùŋká] ‘donkey’ for a Low on the stem.) Thus both the stem [pón-] and the suffixes [-ŋ] and [-ké] have High tones. Their concatenation brings these two Highs together. If downstep in Kɔnni were the result of bringing two Highs together, we would expect H¹H patterns: *[pón¹-íŋ], *[pón¹-ké]. However, the attested forms are [pón-íŋ], [pón-ké], with level High tones. A H¹H pattern is indeed possible on a disyllabic noun, as shown by forms such as [gá’níŋ], [gán’ká] ‘drum rope’, where the downstep arises from a Low that is part of the noun stem. Thus downstep is not the result of concatenation of High tones.

More positively, the presence of downstep in [ù zà’síŋ] in (6b) implies the existence of a floating Low. Third person possessives are marked by a floating High tone that associates to the head noun on the right. Thus all head nouns in this construction begin with a High tone. The isolation form [zàsíŋ] has a LH sequence. When the associative High is added, the result is a H¹H pattern on the word. A H-H concatenation produces no downstep, but a Low tone between the Highs does produce it:

- (7) a. $\begin{array}{cc} \text{L} & \text{H} \\ | & | \\ \text{z} & \text{a} & \text{s} & \text{i} & \text{ŋ} \\ \text{fish} \end{array}$ b. $\begin{array}{cc} \text{L} & \text{H} & & \text{L} & \text{H} \\ | & & | & | \\ \text{u} & & \text{z} & \text{a} & \text{s} & \text{i} & \text{ŋ} \\ \text{3s ASSOC} & & \text{fish} \end{array} \rightarrow \begin{array}{cc} \text{L} & \text{H} & \text{L} & \text{H} \\ | & \backslash & / & | \\ \text{u} & & \text{z} & \text{a} & \text{s} & \text{i} & \text{ŋ} \end{array}$

This is also seen in the case of the downstep created by the addition of a definite article to a noun ending with a Low tone. Many plurals in Noun Class 1

end in Low tones, and when the High-toned plural definite suffix [-há] is added, the result is a downstepped High on the last syllable. The representations for ‘chests; the chests’ is given below. The Low that is present and associated in ‘chests’ is still present but floating in ‘the chests,’ the result of a constraint against a HLH sequence discussed in Sec. 3.3.

- (8) a. júrá ‘chests’ b. jú'rá-há ‘the chests’
- $\begin{array}{cc} \text{H} & \text{L} \\ | & | \\ \text{jú} & \text{ra} \end{array}$

 $\begin{array}{ccc} \text{H} & \text{L} & \text{H} \\ | & \wedge & \\ \text{jú} & \text{ra há} & \end{array}$

With this background, we see that a word like [kpá'án] ‘guinea fowl’ has an underlying HLH tone pattern, with a floating Low causing downstep. The noun stem has HL tone, and the final H is contributed by the suffix [-ŋ]. Note that this word consists of one syllable, with two High tones associated to it.

- (9) $\begin{array}{ccc} \text{H} & \text{L} & \text{H} \\ | & & | \\ \text{kpaa} & & \text{-ŋ} \end{array} \rightarrow \begin{array}{ccc} \text{H} & \text{L} & \text{H} \\ & \wedge & / \\ \text{kp} & \text{a} & \text{a ŋ} \end{array}$

1.4 The OCP and Kɔnni. There is no phonetic difference between two distinct High tones and one High multiply associated to the two syllables. In some languages, sequences of two identical tones are not allowed, a result of the Obligatory Contour Principle (OCP). They either merge, as in $\text{HH} \rightarrow \text{H}$, or one dissimilates, as in Meeussen’s Rule where $\text{HH} \rightarrow \text{HL}$, or a phonetic downstep (possibly a floating Low) is inserted between them. However, in Kɔnni, it does not appear that the OCP is active with regards to either High or Low tones. We can see cases in which sequences of LL or HH are allowed.

For High tones, consider the forms [dʒágâ] ‘shades’ and [múgà] ‘rivers’ (singulars [dʒág-íŋ], [múg-úŋ]). Both have the tonally polar plural suffix [-a], which contains a Low tone here, since the previous tone is High. The question is how to explain the difference between the final Low tone in [múgà] and the final falling tone (HL) in [dʒágâ]. This fall is not the result of a spreading pattern, since it does not occur in the phonologically-similar [múgà]. The most straightforward solution is that [dʒágâ] has two adjacent High tones in underlying representation, and [múgà] has one:

- (10) a. $\begin{array}{c} \text{H H} \\ | \\ \text{dʒag} \end{array} \xrightarrow{-a} \begin{array}{c} \text{H H L} \\ | \quad / \\ \text{dʒ a g a} \end{array}$ b. $\begin{array}{c} \text{H} \\ | \\ \text{m ug} \end{array} \xrightarrow{-a} \begin{array}{c} \text{H L} \\ | \quad | \\ \text{m ug a} \end{array}$

An alternative is that [dʒágâ] has a HL input tone, with the High pre-linked to the second syllable, and a multiply-linked High in the output. However, given this input, the expected output would be the unattested *[dʒâgâ], with a default Low on the first syllable.

- (11) *Hypothetical input* $\begin{array}{c} \text{H L} \\ | \\ \text{dʒa g a} \end{array}$ *predicts output* $\begin{array}{c} \text{L H L} \\ | \quad / \\ * \text{dʒa g a} \end{array}$

Such a default Low does occur with nouns which have toneless stems and a High-toned suffix, such as [kpìbíŋ] ‘louse’ (cf. [ù kpìbíŋ] ‘his/her louse,’ where the absence of downstep indicates that a Low is not present in the input). The alternative of a multiply-linked input High is discussed below.

Neither does the OCP seem active in the domain of Low tones. The word [dàmpàlá] ‘bench’ (lit. ‘logs’) contrasted with [bùrímíŋ] ‘bush donkey’ shows the difference between words with a single multiply-linked Low and two adjacent Lows. When [dàmpàlá] and [bùrímíŋ] have a High-toned word preceding, the tonal behavior differs:

- (12) $\begin{array}{l} \text{dàmpàlá} \\ \text{bùrímíŋ} \end{array}$ $\begin{array}{l} \text{ŋ wó dàmpàlá} \\ \text{ŋ wó 'bùrímíŋ} \end{array}$ $\begin{array}{l} \text{‘bench; I lack bench’} \\ \text{‘donkey; I lack donkey’} \end{array}$

In Kɔnni, a HLH underlying tone on a trisyllabic word is realized as surface H'HH (see discussion in Sec. 3.2). A single Low between Highs is always floating and manifested as phonetic downstep. However, if more than one Low is present between Highs, then they are pronounced as Low tones. I propose that the difference in tonal behavior between ‘bench’ and ‘donkey’ is the result of the presence of two lexical Low tones versus one:

- (13) a. $\begin{array}{ccccccc} L & L & H & & H & L & L & H^3 \\ | & | & | & & | & | & | & | \\ \text{dampala} & & \text{wo} & & \text{dampala} \end{array}$ b. $\begin{array}{ccccc} L & H & & H & L & H \\ & \wedge & | & & | & \wedge \\ \text{burimɪŋ} & & \text{wo} & & \text{burimɪŋ} \end{array}$

Multiply-associated Low tones are unusual in nouns. While there are at least thirty words with the pattern of [dàmpàlá], I have only four examples of the [bùrìmíŋ] pattern.⁴

Since a doubly-associated Low tone is posited for [bùrìmíŋ] above, one might wonder about the possibility of a doubly-associated High tone to also represent [dʒágâ], as in (b) below, which would be OCP-compliant.

- (14) Possible output representations for [dʒágâ] ‘shades’
- a. $\begin{array}{ccc} H & & H & L \\ | & & | & / \\ \text{dʒa} & & \text{ga} \end{array}$ or b. $\begin{array}{ccc} & H & L \\ & \wedge & / \\ & \text{dʒa} & \text{ga} \end{array}$

Multiply-associated tones seem to be rare in Kɔnni nouns, as noted above. Also, (14b) would be the only case in Kɔnni to have a High tone demonstrably deleted, and we will see later in 3.4 that this leads to a constraint ranking paradox when the entire tone system of Kɔnni is considered.

Since identical adjacent tones may exist for both High and Low tones, it is evident that the OCP cannot be an all-pervasive constraint in Kɔnni. It is possible, of course, that the OCP is active in some restricted context, and alternative analyses based on this will be examined in 3.4. But since the OCP is not active in the contexts above, it is quite possible that it is never active and that we never need to invoke the OCP to explain tonal phenomena in Kɔnni.

³ The alert reader might consider another possibility, that *dampala* is toneless in the first two syllables, with only a pre-linked High on the last syllable. The presence of lexical Low on this is shown by the form [ù dām'pálá] ‘his bench.’ The associative construction contributes the initial High on [dām'pálá], but the downstep indicates the presence of a Low tone. Compare this to [ù kpìbɪŋ] ‘his louse’ (cf. [kpìbɪŋ] ‘louse’) in which the first syllable is truly lexically toneless, but the associative construction has no downstep.

⁴ Since /ɪ/ is the epenthetic vowel in Kɔnni, one might surmise that the [ɪ] in [bùrìmíŋ] is epenthetic and the doubly-associated Low has spread from the first to the second syllable. At present I have no data to decide on this vs. a lexically doubly-associated Low, but there are no cases where Low unambiguously spreads.

2. Previous Polarity Analyses

The very term “polarity” assumes a binary contrast in tonal qualities, that is, a contrast between only High and Low tones. Indeed, to my knowledge, the only cases in which tone polarity has been discussed in the literature are two-tone systems, with the possible exception of Mono (Olson in press).⁵ Tone polarity has been reported for a number of African languages. These include Margi (Hoffman 1963, Pulleyblank 1983, 1986), Bambara (Dwyer 1976, Creissels & Grégoire 1993), Mooré and Lama (Kenstowicz, Nikiema, & Ourso 1988), Dagbani (Hyman 1993, Olawsky 1996), Hausa (Newman 1995), Dagaare (Antilla & Bodomo 2000, 2001), and Fur (Kutsch Lojenga 2002). Schuh (1978) also mentions Ngizim, Igbo, and Hausa examples of tone polarity. The only non-African case I am aware of to date is Mundurukú of Brazil, in which nouns acting as independent words as well as suffixes may be polar (Picanço 2002). Historical causes of tone polarity are discussed in Hyman & Schuh (1974).

The analysis of Mooré and Lama in Kenstowicz, Nikiema & Ourso (1988) has been most influential, leading to the interpretation of polarity as an epiphenomenon rather than a true process. In this section I briefly review this analysis, as well as the only OT analysis of a Gur language other than *Kɔnni* that has been produced to date.

2.1 Mooré. Mooré, like *Kɔnni*, is a Gur language. The relevant alternations from Kenstowicz, Nikiema & Ourso (1988) (henceforth KNO) for disyllabic words are given below. Each noun class has tonal patterns of HH, HL, and LH, but not LL.

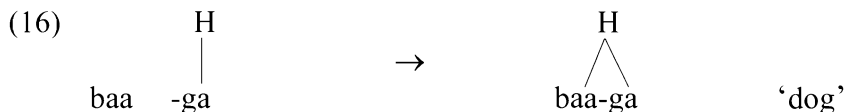
(15) *Mooré* tonal alternations, occurring in all noun class suffixes:

	<i>tone</i>	<i>singular</i>	<i>plural</i>	
Noun Class A	LH	kòr-gó	kòr-dó	‘sack’
	HL	wób-gò	wób-dò	‘elephant’
	HH	bíd-gó	bí-tó	‘sorrel’
Noun Class B	LH	tìi-gá	tìi-sé	‘tree’
	HL	sáá-gà	sáá-sè	‘broom’
	HH	báá-gá	báá-sé	‘dog’

⁵ Though Chumbow (1982) speaks of “polarization” in the three-tone system of Ogori, it is not clear that this is in fact tone polarity rather than some other process.

Noun Class C	LH	tùb-ré	tùb-á	‘ear’
	HL	kúg-rì	kúg-à	‘stone’
	HH	wám-dé	wám-dá	‘calabash’

In a traditional generative framework, a tone polarity rule of the form $\text{Tone} \rightarrow [-\alpha\text{HI}] / [\alpha\text{HI}]_$ was used to give a suffix the opposite tone of the prefix (Schuh 1978). However, in Mooré, this rule changing a tone to the opposite of the previous one does not account for the presence of the HH pattern. KNO proposed a different analysis: all suffixes are High-toned, and the apparent polarity can be reduced to a Meeussen’s-type dissimilation: $\text{HH} \rightarrow \text{HL}$. KNO’s analysis of the HH pattern is that the stem is underlyingly toneless, and the suffix has a High tone which spreads to the stem:



Thus an underlying LH pattern undergoes no change, an underlying HH pattern dissimilates to HL, and the H in an underlying $\emptyset\text{H}$ pattern spreads to give HH:

- (17) Underlying and surface tone patterns:
nouns are lexically H, L, or \emptyset , and suffixes are all H

$\text{L-H} \rightarrow \text{LH}$ $\text{H-H} \rightarrow \text{HL}$ $\emptyset\text{-H} \rightarrow \text{HH}$

The conclusions KNO draw for Mooré, therefore, are that the so-called “polar” toned suffixes actually have underlying High tones, the “polarity effect” is a result of a High-dissimilation rule, and thus there is no tone polarity *per se*. (Hyman 1993 proposes a similar analysis for Dagbani.)

2.2 Dagaare. Antilla & Bodomo (2000, 2001, hereafter AB) give an Optimality Theory analysis of the Gur language Dagaare, which has the same tonal patterns as Mooré (LH, HL, and HH, but not LL), as seen in the data below, for which I have divided the nouns into classes to match the Mooré ones, and inserted morpheme breaks.

(18) *Tonal alternations with nominal class suffixes:*

	<i>tone</i>	<i>Singular</i>	<i>Plural</i>	
Class A	LH	̀̀n-gó	̀̀n-ní	‘rat’
	HL	kóg-ò	kóg-rì	‘mahogany’
	HH	dún-gó	dún-ní	‘animal’
Class C	LH	wì-rí	wì-é	‘horse’
	HL	bí-rì	bí-è	‘seed’
	HH	jàg-rí	jàg-á	‘root’

Antilla and Bodomo’s (2000) analysis differs from KNO’s in a number of ways. First, contrary to KNO’s Mooré analysis, AB posit that all suffixes are toneless, not High. Furthermore, they claim that High, not Low, is the default tone in final syllables of Dagaare. Finally, in AB’s OT analysis, the OCP is active and is ranked higher than the above preferences. Thus in Dagaare, the surface patterns result from the following:

(19) LH surface: lexical Low, inserted High	LØ → LH
HL surface: lexical High, inserted Low	HØ → HL
HH surface: inserted High, which spreads	ØØ → HH

For both Mooré and Dagaare, some version of the OCP drives the analysis; apparent polarity can be analyzed cleanly as OCP-driven dissimilation, and tone polarity can be regarded as an epiphenomenon.⁶ However, the question of adequate scope of data arises; neither set of scholars cites trisyllabic or longer nouns, which as we will see for Kɔnni, have a significant impact on the analysis. (These do exist in the languages, e.g. Dagaare [nímírì] ‘eye’, [nàmìné] ‘chief’, Mooré [léngèré] ‘bowl’.) In the remainder of this paper, I argue that in Kɔnni there actually exists a polar suffix, concurring with Newman (1995) in his arguments for polarity as a natural and genuine pattern.

3. Analysis of Polarity in Kɔnni

The analysis presented here is couched in the Correspondence Theory version of Optimality Theory (McCarthy & Prince 1995), in which various output “candi-

⁶ In a more recent manuscript, Antilla & Bodomo (2001) reanalyze Dagaare suffixes as High-toned rather than toneless. Their new analysis thus is quite similar to that of Mooré, and comes very close to being a direct translation of KNO’s schema into Optimality Theory.

dates” are generated from an input form. These output candidates are evaluated in parallel by constraints, which are ranked with respect to each other. The output candidate which violates the fewest and lowest-ranked constraints is the one which is actually pronounced. I adopt a somewhat conservative approach in proposing constraints in this work; for the most part, the constraints proposed here will either be parallel to well-established input-output constraints, such as the **MAX** and **DEP** family of Correspondence Theory, or closely tied to surface-true generalizations about Kɔnni and other tone languages.

An autosegmental representation of tones is assumed in this work, as in the extensive literature arising from Goldsmith (1976). This is distinct from a theory such as Optimal Domains Theory (Cassimjee & Kisseberth 1998), which eliminates formal association lines between tones and TBU's. The distinction between floating and associated Low tones is crucial in the analysis of downstep in Kɔnni. Also, a detailed representation of tonal features such as [\pm raised, \pm upper] (e.g. Pulleyblank 1986), or the representation of pitch register and pitch height on separate tiers (e.g. Yip 2002, Snider 1999) is not necessary for our purposes here. While the Kɔnni analysis is translatable into such systems, these extra enrichments of representation are not illuminating in this case, and the tones will be abbreviated simply as H for High tone and L for Low tone.

3.1 Basic constraints. From the beginning of autosegmental theory (Goldsmith 1976), it was seen that the optimal configuration, or at least the starting configuration in a derivational framework, was one tonal autosegment associated to one tone-bearing unit (TBU). When there were more tones than TBU's, more TBU's than tones, or some language-specific spreading rule, this pattern was violated, but the one-to-one mapping of tones to TBU's was the general default case. Constraints against toneless TBU's, floating tones, multiply-linked tones, and contour tones all reflect this one-to-one ideal. As with many analyses in OT, constraints are split into families with separate constraints for specific features, or in this case, tones. Splitting of constraints between High and Low tones in Kɔnni is crucial due to their different behaviors: High tones spread, but Low tones do not. Low tones can remain floating, but High tones do not. The following are the members of these families that will be referred to in this work.

(20) *Basic Tone Mapping (Well-Formedness) Constraints*⁷

- a. ***TONELESS**: every TBU is linked to at least one tone.
- b. *(**L**): every Low tone is linked to at least one TBU (no floating Low).
- c. ***H-SPREAD**: a High tone is not linked to more than one TBU.
- d. ***CONTOUR**: a TBU is not linked to more than one tone.

In our view of tones as autosegments, we also use the common **MAX** and **DEP** constraints, again specified for High and Low tones. The following will be referred to in this paper.

(21) *Tone Faithfulness Constraints*

- a. **DEP (H)**: every High tone of the output has a correspondent in the input (prohibits insertion of H).
- b. **DEP (L)**: every Low tone of the output has a correspondent in the input (prohibits insertion of L).
- c. **MAX (H)**: every High tone in the input has a correspondent in the output (prohibits deletion of H).

3.2 The polar plural suffix of noun class 1. In this section I go beyond the basic constraints listed in the previous section, and analyze the tonal behavior of the class 1 plural suffix in Kɔnni in terms of a constraint **POLAR**, specific to that morpheme.

Recall that in Mooré, disyllabic nouns have one of the patterns LH, HL, or HH (but never LL). Kenstowicz, Nikiema, & Ourso (1988) analyze this and a related pattern in Lama as a result of all suffixes having a High lexical tone, and the stems being either High, Low, or toneless. The apparent tone polarity is analyzed as being the result of dissimilation.

We have seen that suffixes on most nouns in Kɔnni are also High-toned. It is possible that all suffixes were High-toned in proto-Gur, or at least the branch that contains Kɔnni, Dagaare, Mooré, and Lama. However, the behavior of the plurals of Noun Class 1 in Kɔnni is inconsistent with the idea that they are synchronically High-toned. These plurals are exemplified by the forms below. While the singular suffix for each is a High-toned [-ŋ], the suffix of the plural form is either [-a] or [-e], depending on ATR vowel harmony, and this suffix is not surface High-toned, but surfaces with a tone opposite to the preceding stem tone.

⁷ In the total picture of Kɔnni, *(**H**) and ***L-SPREAD** are also active. However, these are not necessary in analyzing tone polarity. For the same reason, I have not listed **MAX (L)** in (21).

(22) <i>singular</i> ⁸	<i>plural</i>	<i>stem tone</i>	<i>pl.suffix tone</i>	
tǎ-ŋ	tàn-á	L	H	‘stone/s’
sí-ŋ	sí-à	H	L	‘fish/es (sp.)’
bìs-íŋ	bìs-a	L	H	‘breast/s’
tíg-íŋ	tíg-è	H	L	‘house/s’
zùnzú-ŋ	zùnzú-à	LH	L	‘maggot/s’

Since the assuredly High-toned suffix /-ŋ/ yields a different tonal result than the plural suffix, the Mooré analysis using underlying High tones for all suffixes and using a general **OCP(High)** schema cannot apply here. At the very least, an OCP constraint would need to be specific to the Noun Class 1 plural rather than being general. However, as discussed in 1.4, the OCP is never otherwise demonstrably needed in Kɔnni, and data and a ranking paradox that rule out **OCP(High)** are discussed in 3.4.

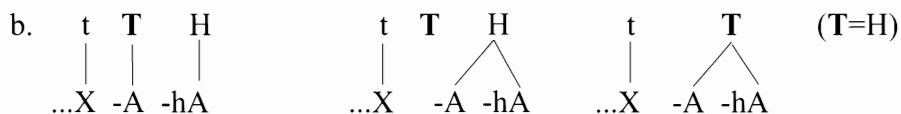
Thus this particular suffix of Kɔnni is apparently polar-toned, in contrast with Mooré, where most noun suffixes were apparently polar. In Mooré, both the “polar” nouns and those that do not exhibit polarity could be analyzed with the same rules, to give a unified account of all Mooré nouns. In Kɔnni, most nouns do not have apparent polarity; only one suffix exhibits such. Positing a lexical High tone with no other stipulations to account for these is inadequate, since this leads to the same behavior as the other suffixes, which are definitely High-toned. I propose a constraint expressing this surface polarity, formulated as follows.

- (23) **POLAR**: in a Noun Class 1 plural, the last tone of the plural is opposite in value to the immediately preceding tone.

Note that by the “last tone of the plural” I mean the tonal autosegment T of the plural form that either (a) is word-final in nondefinite forms, or (b) in definite forms, immediately precedes the tone of the definite suffix. **POLAR** thus has a specific domain, and (22a, b) below give configurations that satisfy it.

- (24) a.

⁸ Some singular suffixes appear as /-íŋ/ rather than /-ŋ/ due to an epenthetic vowel. Also, the true noun stem of [tǎ-ŋ] is actually /tan-/ , but the final /n/ elides before the suffix.



The constraint refers to a surface pattern, and so potentially has several ways to satisfy it, given a variety of inputs. As we will see below, there are in fact at least two, and possibly three, ways to satisfy this constraint: the polar tone T may be inserted, be already present in the input, or possibly spread from the definite suffix tone.

The segmental portion of the NC1 plural is *-a/-e*, which I analyze as toneless.⁹ The word [tàná] ‘stones’ has a Low-toned stem (cf. [tǎŋ] ‘stone’, [tàníní] ‘the stone’, both with High-toned suffixes). A High tone is inserted on the NC1 plural suffix.

(25)	UR	L-Ø	POLAR	DEP(H)	DEP(L)
		tan-a			
	☞	L H			
				*	
a.		tana			
		L			
		\	*!		
b.		tana			
		L L			
			*!		*
c.		tana			

The above tableau is given to illustrate the rankings of **POLAR** and **DEP(H)**. The winning candidate (a) must insert a High tone to avoid violating **POLAR**. The tableau for a Low-toned polar suffix as in [tíg-è] ‘houses’ is similarly straightforward, and would show that **POLAR** also outranks **DEP(L)**.¹⁰ In many nouns, however, there are additional complexities present.

⁹ Underlying toneless representations are needed in other cases of the nominal phonology as well; see fn. 3.

¹⁰ Actually, simple cases such as these two can actually be accounted for without **POLAR**. For [tàná], a High tone is inserted on the suffix as a result of an independently needed constraint **H-PRES**, which requires a High tone in a word. For [tígè], a Low tone is inserted on the suffix

Recall that [dʒágâ] ‘shades’ has a HH stem tone (see Sec.1.4). Here, a polar Low tone is inserted on the suffix, even though a normal mapping of tones to syllables would satisfy ***TONELESS**. The **MAX(H)** constraint is ranked above **POLAR** because as far as is known, **MAX(H)** is never violated, while in one case **POLAR** is, as we will see in Sec. 3.2.

(26)

UR HH-Ø	MAX(H)	POLAR	*CONTOUR	DEP (L)
 dʒag -a				
 a. dʒaga			*	*
 b. dʒaga		*!		
 c. dʒaga	*!			*
 d. dʒaga	*!		*	*

The above tableau shows the ranking of **MAX(H)** and **POLAR** over ***CONTOUR**. In [dʒágâ], the winning candidate (a) satisfies **POLAR** by inserting a Low tone, without deleting an underlying High, which would violate **MAX(H)**. Candidate (b) retains its input tones, but does not satisfy **POLAR** and is therefore ruled out. Candidate (c) satisfies **POLAR**, but incurs a fatal violation of **MAX(H)** by deleting the second underlying High tone. Candidate (d) is phonetically identical to (a) but has achieved that at the cost of deleting the input High, which we showed in Sec. 1.4 is an untenable representation.¹¹

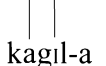




as the normal default. However, the more complex cases considered below cannot be so treated.

¹¹ An additional candidate, *dʒágá`*, would be even more optimal, given these constraints but has the shortcoming of being phonetically equivalent to candidate (b). The **POLAR** constraint assumes a surface effect, either an associated, pronounced tone, or a floating Low that causes downstep, again having a phonetic effect.

The next case, [káǵílà] ‘crops (of bird),’ is similar in tonal output (HHL tones) to [dǵágâ], but dissimilar in input: every tone present in the output is already present in the input, as we see by considering the singular form [káǵí¹líŋ]:

- (27)
- | | |
|-----|--------------|
| H | H L H |
| | |
| k a | g ɪ l ɪ ŋ |

In the singular form, the stem provides the HHL tones, and the [-ŋ] suffix provides the final High tone. (The *ɪ* preceding the [-ŋ] suffix is epenthetic.) In the case of [káǵílà] ‘crop (of bird),’ **POLAR** is satisfied with no tone insertion at all; all tones are present in the input.

- (28)
- | | UR HH L -∅ | MAX(H) | POLAR | *CONTOUR | DEP(H) |
|----|---|--------|-------|----------|--------|
| | 
kagil-a | | | | |
| a. | 
kagila | | | | |
| b. | 
kagila | | | | *! |
| c. | 
kagila | | | *! | *! |
| d. | 
kagila | *! | * | | |

Above, the HHL tonal pattern sponsored by the root associates not only to that root, but also to the final syllable of the word, which includes the plural suffix. Since the final tone on the plural is opposite to that of the preceding tone, the winning candidate (a) satisfies **POLAR**, and violates no other relevant constraints. Candidate (b), in which another tone H is added, is ruled out by **DEP(H)**. Candidate (c) not only inserts a High tone, but also has a contour, which is disfavoured. Since I have no data to determine the relative ranking of ***CONTOUR** and **DEP(H)**, violations of both are marked fatal for (c). An additional candidate [káǵíl-ǎ] with

LH rather than HL on the final syllable would be similarly ruled out. Candidate (d) deletes a High tone and is ruled out by **MAX(H)**.

Thus far, we have accounted for the data by merely adding **POLAR** to faithfulness and very basic well-formedness constraints. However, in [dʒágá'há] 'the shades,' there is a new pattern. The polar tone is inserted, as has been seen above with [tàná] 'stones,' but the inserted polar tone in [dʒágá'há] is floating. To account for this pattern, we must present a well-formedness constraint that deals with a pattern previously noted for Kɔnni in (4): a surface HLH tone is not licensed. Rather, when morphemes that would have produced such a sequence are concatenated, the result is H¹HH.


A possible reason for this ban on HLH can be traced to the nature of communication. A language must have "texture" to it, a variation in whatever parameters are relevant, in order to communicate any information. However, these parameters must not vary so rapidly that it presents excessive difficulty either in processing the information or producing the articulations. What counts as "rapid" may vary with the type of sound, of course; a reviewer points out that the most salient cues for consonant identification are contained in the 10 ms or so of release burst. However, tones are neither articulated nor perceived in so short a time frame. In at least some tonal languages, then, it is plausible that a HLH sequence involves a rate of alternation that the speakers are not "willing" to make. The constraint expressing this is as follows.

(29) ***HLH** = no Low can be associated when between two High tones¹²

* H L H
 |
 X

The citation form of the constraint, ***HLH**, is shorthand for the fuller representation of the unlicensed configuration at the bottom of (27) above. With this in place, we may now present the tableau for [dʒágá'há] 'the shades.'

¹²This constraint seems to be active in a variety of languages, as expected if there is any connection to the communicative function discussed above. (Of course, Optimality Theory would simply rank *HLH low in languages where it is not active.) Quite a few African languages prohibit HLH (Odden 2000), and Mianmin and some other tonal languages of Papua New Guinea also disallow HLH. There is an asymmetry in the relation between High and Low, in that a LHL sequence is much more common cross-linguistically than HLH. This likely relates to the fact of High as prominent, but the reasons for this asymmetry deserve further investigation.

(30)	UR HH -Ø-H d3ag -a -ha	MAX (H)	*HLH	POLAR	*CONTOUR	*(L)
	 H H L H a. d3a ga ha					*
	H H H b. d3 a ga ha			*!		
	H H LH c. d3a ga ha		*!		*	
	H L H d. d3a ga ha	*!				*
	H H L e. d3a ga ha	*!		*		

The winning candidate (a) violates no constraints except ***(L)** (and also **DEP(L)**, which is ranked so low in Kɔnni as to not be listed in the tableau above). Candidates (b) and (e) violate **POLAR**, while (c) violates ***HLH** by having a Low associated between two Highs. Candidates (d) and (e) violate the top-ranked **MAX(H)** by deleting a High tone. Thus the optimal candidate inserts a Low tone, which is floating.

The relation of **POLAR** to the floating Low tone in (28) deserves a bit more comment, since the constraint refers to “the last tone of the plural.” This floating tone, even though not associated to the segmental part of the plural morpheme, can be considered as belonging to that morpheme rather than to the definite suffix because of the dependency involved. When the plural suffix is present, the Low tone is inserted, as much in (28) as in (24), where there was no definite suffix. Without the presence of the plural morpheme, the Low tone would not occur.

Thus far we have seen surface polar tones that are inserted, and one that has already been present in the input. In some cases, the tone in question may be an inserted one, as in the previous case, but spreading as a third source of polar tone

is also a distinct possibility. One of the forms illustrating this uncertainty is [tànáhá] ‘the stones.’

(31)

UR	L -Ø-H	POLAR	*H-SPREAD	DEP (H)	DEP (L)
	$\begin{array}{c} \text{tan-a-ha} \\ \quad \\ \text{L} \quad \text{H} \end{array}$				
☞	$\begin{array}{c} \text{L H H} \\ \quad \quad \\ \text{a. tanaha} \end{array}$			*	
☞	$\begin{array}{c} \text{L H} \\ \quad \diagup \\ \text{b. tanaha} \end{array}$		*		
	$\begin{array}{c} \text{L L H} \\ \quad \quad \\ \text{c. tanaha} \end{array}$!*			*

Candidates (a) and (b) are phonetically indistinguishable, and I know of no phonological test in Kɔnni to differentiate these. The issue of ranking of *H-SPREAD vs. DEP(H) depends on whether it is better to spread a High onto an empty TBU or insert a new High. Both constraints are active in Kɔnni, and are visible in constraining possible outputs. On the other hand, both are also known independently to be violated in some cases. High tones do spread, as we have seen in (6), for example, violating *H-SPREAD. Also, High tones can be inserted on a noun, as in the case of the toneless [hògú] ‘woman,’ which surfaces with a High tone. This violates DEP(H), but satisfies the higher-ranked H-PRES, which requires a High tone in a word.¹³ The only cases of High insertion we have seen in Kɔnni involve words that have no underlying High, and it is quite possible that High insertion is indeed limited to those. In the unambiguous cases, High-spreading is definitely more common than High-insertion, and it may be more

¹³ Some of the evidence that leads to the conclusion that [hògú] ‘woman’ is underlyingly toneless is in the associative construction [ù hògù] ‘his woman/wife.’ The High tone in this phrase comes from a High tonal associative morpheme. If the High in [hògú] were present in the input, we would expect the unattested *[ù hò’gù]. Also, in Noun-Adjective constructions such as [hògù-bián] ‘bad woman,’ hògu has no High tone at all, in contrast to nouns which do have high tones. Suggestive is also the fact that the related Gur languages Mooré and Dagaare have also been analyzed as having the cognate noun as underlyingly toneless. (Kenstowicz, Nikiema & Ourso 1988, Antilla & Bodomo 1997).

probable here. However, at this point, I have no clear empirical evidence to decide the ranking and we must live with the indeterminacy.

3.2 A Violation of POLAR. Since constraints by their nature are violable in Optimality Theory, one should not be surprised to find cases in which **POLAR** is violated. In the plural forms below, **POLAR** is satisfied, but in the plural definite forms, it is not. This pattern is restricted to nouns that are vowel-final. Thus when the plural /-A/ is added, the result is a CVV final syllable for the plural:

- (32) *plural* *plural definite*
- | | | |
|--------|----------|---------------------------|
| sìsì-é | sìsìè-hé | ‘grasscutter (an animal)’ |
| dʒù-á | dʒùà-há | ‘tail’ |
| nì-á | nìà-há | ‘rain’ |
| bì-é | bìè-hé | ‘goat’ |

If **POLAR** were satisfied in the plural definites, we would expect forms like the unattested *[sìsìéhé] ‘the grasscutters.’ The problem here is a nonfinal contour, which except for a very few exceptional forms never occurs in Kɔnni. (Recall that the syllable is the TBU in Kɔnni and even though *sisi-* and *-e* are separate morphemes, the *ie* that results from their combination is a single syllable.) Outranking **POLAR**, then, is a constraint penalizing nonfinal contours. Contours in general are dispreferred to level tones, but nonfinal contours are especially disfavoured:

- (33) **CONTOUR-NONFINAL (*CONT-NF):** nonfinal contour tones on a TBU are prohibited¹⁴

(34)

UR	L-Ø-H	*CONT-NF	POLAR	*CONTOUR
	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">bi-e</div> <div style="text-align: center;">-he</div> </div>			
<div style="display: flex; align-items: center;"> P <div style="text-align: center;"> L H a. bie he </div> </div>			*	
<div style="text-align: center;"> LH H b. bie he </div>		*!		*

¹⁴This constraint is from Zhang 2000, and is better motivated than the similar ***CONT-INTERNAL** which I have previously used.

3.3 OCP-based alternative analyses. In the presentation thus far, the most plausible alternative to a **POLAR** constraint, an analysis based on some version of the OCP, has not been examined. In this section, I show that an OCP-based analysis, whether a High- or Low-toned suffix is assumed, encounters considerable difficulty with the Kɔnni data. I will consider three possible proposals.

First, if we assume High tone for the suffix /-Á/, then when the preceding tone is High, an OCP(H)-based analysis involves deleting this High tone and replacing it with a Low:

(35) hypothetical: /tíg-Á/ → [tígè] ‘houses’

There are several complications with this scenario. First, the OCP appears not to be active in Kɔnni in any other context. As discussed in Sec. 1.4, the case of [dʒág-â] ‘shades’ vs. [múg-à] ‘rivers’ shows the presence of two adjacent High tones. A further complication is that a High-toned /-Á/ would entail an input of /múg-á/ for [múg-à] ‘rivers,’ and the High on the suffix would be deleted and a Low inserted. However, a High tone is never demonstrably deleted in Kɔnni; this would be a violation of **MAX (H)**, which is undominated in every circumstance examined. It would be possible to assume a High tone is deleted only for the Noun Class 1 plural suffix, but this adds unnecessary complexity.

Furthermore, assuming a High tone for the plural suffix /-A/ leads to a constraint ranking paradox. From other tonology, we know that **MAX(H)** outranks ***CONT-NF**, that is, **MAX(H) >> *CONT-NF**. The only case in which ***CONT-NF** is violated is in five plural forms such as [nàá'líŋ] ‘chiefs’ (NC5), all with the plural suffix *-líŋ*. A sample paradigm is given below.

(36)	<i>singular</i>	<i>sing. definite</i>	<i>plural</i>	<i>pl. definite</i>	
	nàǎŋ	nàǎŋwa	nàá'líŋ	nààlí' bá	‘chief’

The noun stem *naaŋ* has a lexical Low tone, with the H on the LH surface tone on [nàǎŋ] being inserted, since any word in Kɔnni requires a High tone (Cahill 1999). The singular definite suffix [-wá] is High-toned, as with most suffixes in Kɔnni.

(37)	a.	L		LH		b.	L	H		L	H
		naaŋ	→	naaŋ			naaŋ	wa	→	naaŋ	wa

Given these data, it is evident that it is the plural indefinite suffix [-lɪŋ] which causes this unusual tonal pattern, and indeed, a non-final contour tone is found only with this one suffix. It is best explained by positing a complex HLH underlying tone for [-lɪŋ], which associates in the surface form as follows (the ? is noted because it is not certain how the tones may be associated to the segments in input form, though at least two tones are assumed to be associated).

$$(38) \quad \begin{array}{ccc} \text{L} & \text{HLH} & \\ | & ? & | \\ \text{naa} & & \text{lɪŋ} \end{array} \quad \rightarrow \quad \begin{array}{ccc} \text{L} & \text{H} & \text{LH} \\ & \vee & | \\ \text{n} & \text{aa} & \text{lɪŋ} \end{array}$$

A tableau for this form is as follows.

(39) [nǎǎ'ɪŋ] 'chiefs'

MAX(H) >> *CONT-NF

UR	L - H L H	MAX(H)	*HLH	*CONT-NF	*CONTOUR
	$\begin{array}{ccc} & ? & / \\ & & / \\ \text{naa} & - & \text{lɪŋ} \end{array}$				
a.	$\begin{array}{ccc} \text{L} & \text{H} & \text{L} & \text{H} \\ & \vee & & \\ \text{naa} & & & \text{lɪŋ} \end{array}$			*	*
b.	$\begin{array}{ccc} \text{L} & & \text{L} & \text{H} \\ & & \vee & \\ \text{naa} & & \text{lɪŋ} & \end{array}$	*!			*
c.	$\begin{array}{ccc} \text{L} & \text{H} & \text{L} & \text{H} \\ & \vee & & \vee \\ \text{naa} & & & \text{lɪŋ} \end{array}$		*!	*	**
d.	$\begin{array}{ccc} \text{L} & \text{H} & \text{L} & \text{H} \\ & & \vee & \vee \\ \text{naa} & & \text{lɪŋ} & \end{array}$		*!		*

Since a LH contour is preserved in the initial syllable, it is evident that **MAX(H)**, preserving the H input tone, outranks ***CONT-NF**.¹⁵ But consider the

¹⁵The candidate [nǎǎl'ɪŋ], with a HLH on the last syllable, is a possible configuration as well (cf. [jàjǔ'ón] 'flying ant', with the same tonal configuration on the final syllable). The difference between the illicit candidate *[nǎǎl'ɪŋ] and the attested [jàjǔ'ón] is that the latter has only one tone contributed by the suffix, while *[nǎǎl'ɪŋ] has three. Thus it is probable that the

forms in (30) such as [sìsìè-hé] ‘the grasscutters,’ assuming a High tone for the plural suffix. In this case, the High of /-A/ (which is -e here due to vowel harmony) is deleted to avoid a nonfinal contour. So here ***CONT-NF** >> **MAX(H)**, the reverse of the ranking above. In this tableau the morphemes are split in the input to show underlying tonal associations, but in output candidates, the syllables, as TBUs in Kɔnni, are the relevant divisions.

(40) [sìsìè-hé] ‘the grasscutters’ ***CONT-NF** >> **MAX(H)**

UR	L L H H	*CONT-NF	MAX(H)	*CONTOUR
	 si si -e -he			
☞	L L H a. si sie -he		*	
	L L H H b. si sie -he	*!		*

Thus if we assume a High tone for the /-A/ suffix, we must have a ranking of **MAX(H)** >> ***CONT-NF** in (37), but the reverse ranking in (38).

The most telling argument, however, against a High-toned suffix changed by the OCP is illustrated by forms like [káǵílà] ‘crops (of bird)’. As shown by the singular form [káǵí¹lǐŋ], repeated below from (25), the noun stem [kǵíl-] has a HHL tone pattern. In the singular citation form, the [-ŋ] suffix adds the High tone to give the surface form schematised below.

(41)

H	H	L	H
k a	ǵ í	l	ŋ

If the plural suffix /-A/ were indeed High-toned, this plural High tone would not be adjacent to another High, and the OCP would not apply. All the tones in the input would be present in the output, and we would get a tonal configuration as below, which would be phonetically [káǵí¹lá].

key to the ill-formedness of *nàálí¹ŋ* is a result of multiple violations of **MAX(ASSOC)**, a constraint independently needed for Kɔnni (Cahill 1999).

- (42) * H HLH (unattested)
- | | |
- k a g ɪ l a

This is a perfectly legal configuration in Kɔnni (it is the same mapping of tones to TBUs as the singular [káǵí'líŋ] in (39)). The fact that [káǵí'là] rather than [káǵí'lá] is actually the output demonstrates that the plural suffix is not High-toned.

The second and third alternative proposals both posit the NC1 suffix as lexically Low-toned. No one in Gur studies to my knowledge has proposed a Low-toned plural suffix, so it would be areally quite unusual. However, the suffix often surfaces as Low, so the possibility of a lexical Low tone on this suffix deserves consideration.

Probably the most plausible alternative scenario with an underlyingly Low NC1 suffix involves two new constraints: **FINAL-H**, which is satisfied by having a High tone word-finally, and **OCP(High)**, which is violated by two adjacent High tones. **FINAL-H** is a plausible proposal, since most Kɔnni nouns, as well as verb forms, end in a High. The domain of **OCP(High)** would be limited to the NC1 plural suffix, since there are demonstrable occurrences of HH elsewhere in Kɔnni. **FINAL-H** would force the NC1 suffixal Low to be High if preceded by a stem Low, and **OCP(High)** would prevent a suffixal High if the preceding stem tone was High.

Forms like [tígè] ‘houses’ show that **OCP(High)** >> **FINAL-H**, and this approach works for much of the data.

- (43) hypothetical: /tíg-À/ → [tígè] ‘houses’
 /tàn-À/ → [tàna] ‘stones’

UR	tíg-è	OCP (High)	FINAL-H	DEP(H)
☞	a. tíg-è	*!	*	
	b. tíg-é			*
UR	tàn-à			
☞	a. tàn-á			*
	b. tàn-à		*!	

However, again the form [káǵí'là] ‘crops (of bird)’ shows this proposal to be untenable. The singular form [káǵí'líŋ] shows that the noun stem has tone HHL. The ranking **OCP(High)** >> **FINAL-H** above would produce a form that inserts a H to satisfy **FINAL-H**. Since the stem and the suffix are Low, inserting a

final High would not violate **OCP(High)** and the optimal form would be the unattested *[káǵí'lá].

(44) hypothetical /káǵí[̀] - Ā/ → *[káǵí'lá]

UR H H L L	OCP (High)	FINAL-H	DEP(H)
<div style="text-align: center;"> kagil a H H L L </div>			
a. <div style="text-align: center;"> H H L kagila </div>		*!	
● b. <div style="text-align: center;"> H H L H / kagila </div>			*

The actual attested form (a) violates **FINAL-H**, but this tableau incorrectly eliminates it. The winning candidate (b) is the unattested *[káǵí'lá]. (I assume the extra Low tone is deleted by a Stray Erasure type constraint, though nothing in this analysis hinges on this assumption.) Thus the set of assumptions that can account for many forms makes an incorrect prediction with others.

Finally, the third OCP-based account also assumes Low tone for the suffix /-Ā/. When the stem-final tone is Low, an **OCP(L)** constraint forces the suffixal Low tone to be replaced with a High. If the stem-final tone is High, the suffixal Low remains. As discussed in Sec. 1.4, the case of [dàmpàlá] ‘bench’ contrasted with [bùrìmín] ‘bush donkey’ shows the existence of two separate adjacent Low tones, so the **OCP(L)** must be restricted to the particular context of the NC1 plural morpheme and its stem.

(45) **OCP(L)** (hypothetical): adjacent Low tones are prohibited in NC1 plurals when one is associated to the noun stem and the other is associated to the plural morpheme.

In the simple hypothetical /tàn-Ā/ → tàná ‘stones’ the analysis is straightforward. **OCP(L)** must outrank both **DEP(H)**, since a High has been inserted, and a previously-unmentioned constraint, **MAX(L)**, since a Low has been deleted. Concomitant changes make it impossible to determine which of these two constraints is more highly ranked, as seen in the more complex case below.

(46) hypothetical: /sìsì-À/ → [sìsìé] ‘grasscutters’

UR	LLL		OCP(L)	DEP(H)	MAX (L)
	 sisi-e				
 a.	 sisié			*	*
b.	 sisié		*!		
c.	 sisié			*	*!*
d.	 sisié		*!		*

The winning candidate (a) has replaced the suffixal Low by a High. Candidate (b) definitely violates the **OCP(L)**, and perhaps another constraint forbidding two identical tones on the same TBU. Candidate (c) loses by deleting two Low tones. Candidate (d) deserves closer examination, since it will be relevant to the next tableau as well. Is the final Low in (d) part of the stem or the suffix? Recall that in Kɔnni the TBU is the syllable, so this Low is directly associated to the final syllable *sie*. The syllable contains two morphemes, and so the Low is actually associated through the syllable to both morphemes. Since this Low is associated to the suffix, **OCP(L)** looks to see if there is an adjacent Low associated to the stem. There is, and so **OCP(L)** is violated. Note that it does not matter which of the two last input Lows have been deleted; the output (d) would be the same in either case. This scenario adequately accounts for [sìsìé], but predicts the wrong output when the definite article is added, as below. The ranking of ***CONT-NF** and **OCP(L)** is indeterminate, but this does not affect the selection of the winning candidate.

(47) hypothetical: /sìsì-À-hÁ/ → [sìsìèhé] ‘the grasscutters’

UR	LLL H	*CONT-NF	OCP(L)	DEP(H)	MAX (L)
	<pre> sisi-e-he </pre>				
a.	<pre> L L H sisie-he </pre>		*!		*
b.	<pre> LL LH \ \ sisie-he </pre>	?	*!		
b.	<pre> LL HH \ \ sisie-he </pre>	*!		*	*
d.	<pre> L H H sisie-he </pre>			*	**

Critically, the actual attested candidate (a) is ruled out by **OCP(L)**, by the same reasoning we applied above, and the unattested (d) is selected as optimal. We therefore reject this final OCP-based alternative analysis.

The Dagaare, Mooré and Dagbani analyses all rely on the OCP as the crucial factor in accounting for apparent tone polarity. In Dagaare, A&B are explicit that the OCP prevents two like tones from occurring on the surface. In Mooré and Dagbani, the driving force for the rule changing a HH to a HL is implicitly the OCP. However, in Kɔnni, as we have seen, the OCP is unnecessary to account for tonal phenomena, and it is possible that the other Gur languages could also be re-analyzed without it.

4. Discussion

In this section I briefly discuss several theoretical issues that the polarity analysis here pertains to and I hope illuminates.

As mentioned, the KNO analysis of Mooré has been interpreted as obviating the need for true polarity (even beyond Mooré), and in fact many plural forms in Kɔnni NC1 can also be accounted for without invoking a specific **POLAR** constraint. For example, on the toneless suffix of the NC1 plural, a High tone is inserted if there is not a High in the word. A Low is inserted otherwise, as the general default tone. However, this approach will not work with more complex

words, as we have seen. This raises the question whether the analyses of KNO and AB would work as well if given a fuller range of data from these languages. KNO mention one trisyllabic word, [lɛ́nggèré] ‘bowl,’ and though they do not specifically analyze it, it does fit well into their analysis. The High-toned suffix [-ré] is not adjacent to another High, and so remains as High. There is also a disyllabic H¹H tone pattern that KNO did not note, in words like [wá¹fó] ‘snake’ (Nikiema 1980), in which presumably the downstep is due to a floating Low tone. In that case, the High of the suffix [-fó] is again not adjacent to another High on the tonal tier, and so remains High. What would be problematic for KNO’s analysis is the existence of trisyllabic words with a HLL pattern. The last syllable would necessarily be the underlyingly High suffix. Since it would be adjacent to a Low, the KNO rule HH → HL would not apply, and we would expect surface HLH, but there would be no way to generate HLL. Some expressions with this pattern are listed in Nikiema (1980: 38), but it is unclear there whether all of these are single words or not. For Dagaare, AB acknowledge the existence of words longer than disyllabic, mention that most of them are probably compounds, but specifically exclude these from the scope of their study. The Dagaare definite morpheme is not a suffix as it is in *Kɔnni*, but a separate word that precedes the noun, so there is not the opportunity to test Dagaare in the same way as was done for *Kɔnni*.

Another topic worthy of comment is the location of polarity. Pulleyblank (1986) observes that polarity effects occur at the edges of domains. This is indeed true in every case cited in the works I have referred to here, but we have seen cases in *Kɔnni* where the polar tone occurs not at the edge of the whole noun word, but occurs immediately preceding the edge tone. This is the case, for example, in [dʒágá¹há] ‘the shades’, where the polar tone is the floating Low of the downstep. It is also the case in [tàn-á¹há] ‘the stones,’ where the High of the plural morpheme [-á] is either inserted or spread from the definite suffix [-há]. The *Kɔnni* case shows that to retain this statement as a universal, we must redefine “domain”, possibly to something like “the edges of morphemes.”

The constraint **POLAR** is morphologically-based; it must refer to one specific morpheme, the Noun Class 1 plural in *Kɔnni*. In the larger picture of tone polarity, this is consistent with the claim in Anderson (1974) that all polarity rules (termed “exchange rules” there) are either morphologically or lexically restricted, and with Schuh’s (1978) observation that all tone polarity rules known to him are marked for specific morphemes, rather than being a part of the general phonology. Moreton (1999) makes the observation that classical OT, if it is limited to only faithfulness and markedness constraints, does not handle these “exchange rules” that are morphologically based. The limits must evidently be extended.

Finally, the constraints of Optimality Theory appear most advantageous when compared to a derivational account when they deal with “conspiracies,” in which a constraint expresses a surface generalization that may be generated from an input form in a number of different ways. One example is the well-known **NoCODA** constraint. If an underlying representation is CVC, **NoCODA** may be satisfied by any of several paths, such as deletion of the final C or epenthesis of a final V. In a similar fashion, the Kɔnni constraint **POLAR** is an expression of a surface pattern. This pattern may be generated from an input in at least two, and possibly three independent paths. In [kágílà] ‘crops (of bird),’ the polar tone is present in the input. In [džágâ] ‘shades,’ as well as many other nouns, a polar tone must be inserted. And in [tànáhá] ‘the stones,’ it is possible that the polar tone comes from spreading. Thus the surface polar tone can be generated from underlying representations in several distinct ways, and so is quite in the spirit of Optimality Theory. Such an analysis offers a principled explanation of the position of Newman (1995) when he says that polarity is a natural pattern to be found in languages, not one to be always reanalyzed as dissimilation.

REFERENCES

- Anderson, Stephen. 1974. *The Organization of Phonology*. Academic Press: New York.
- Antilla, Arto, & Adams Bodomo. 1996. “Stress and tone in Dagaare”. MS, Stanford University. [Also ROA-169-1296.]
- Antilla, Arto, & Adams Bodomo. 2000. “Tone polarity in Dagaare”. *Advances in African Linguistics*, ed. by Vicki Carstens & Frederick Parkinson. Proceedings of the 28th Annual Conference on African Linguistics at Cornell University. Africa World Press: Trenton, NJ. Pp. 119-134. [Also ROA-169-1296.]
- Antilla, Arto, and Adams Bodomo. 2002. “Tone and morphology in Dagaare”. MS, NYU & University of Hong Kong.
- Bickmore, Lee. 2000. “Downstep and fusion in Namwanga”. *Phonology* 17: 297-331.

- Cahill, Michael. 1999. *Aspects of the Morphology and Phonology of Konni*. Columbus: Ohio State University, Ph.D. dissertation.
- Casali, Roderic F. 1995. "An overview of the Nawuri verbal system". *Journal of West African Languages* 25.1: 63-86.
- Carlson, Robert. 1983. "Downstep in Supyire". *Studies in African Linguistics* 14: 35-45.
- Cassimjee, Farida, & Charles Kisseberth. 1998. "Optimal Domains Theory and Bantu tonology: a case study from Isixhosa and Shingazidja". *Theoretical Aspects of Bantu Tone*, ed. by Larry Hyman & Charles Kisseberth. CSLI Publications: Stanford. Pp. 33-132. [Also ROA-176-0297].
- Chumbow, Beban Sammy. 1982. "Contraction and tone polarization in Ogori". *Journal of West African Languages* 12.1: 89-103.
- Creissels, Denis, & Claire Grégoire. (1993). "La notion de ton marqué dans l'analyse d'une opposition tonale binaire: Le cas du mandingue". *Journal of African Languages and Linguistics* 14: 107-154.
- Crouch, Marj. 1985. "A note on syllable and tone in Vagla verbs". *Journal of West African Languages* 15.2: 29-40.
- Dwyer, David. 1976. "The analysis of Bambara polarization". *Studies in African Linguistics*, supplement 6: 27-38.
- Essien, Okon E. 1990. *A Grammar of the Ibibio Language*. University Press: Ibadan.
- Goldsmith, John. 1976. *Autosegmental Phonology*. Cambridge, MA: MIT, PhD dissertation.
- Hawkinson, Ann. 1986. *Bakweri Verb Morphology*. Berkeley: University of California, Ph.D. dissertation.
- Hoffman, Carl. 1963. *A Grammar of the Margi Language*. Oxford University Press: London.

- Hyman, Larry. 1993. "Structure preservation and postlexical tonology in Dagbani". *Studies in Lexical Phonology*, ed. by Sharon Hargus & Ellen Kaisse. Academic Press: San Diego. Pp. 235-254.
- Hyman, Larry, & Russell G. Schuh. 1974. "Universals of tone rules: evidence from West Africa". *Linguistic Inquiry* 5: 81-115.
- Kagaya, Ryohei. 1992. "A tonal system of verbs of the Bakueri language". *Studies in Cameroonian and Zairean Languages, Bantu Linguistics*, Vol 3. Institute for the Study of Languages and Cultures of Asia and Africa. Pp. 1-38.
- Kenstowicz, Michael, Emmanuel Nikiema & Meterwa Ourso. 1988. "Tone polarity in two Gur languages". *Studies in the Linguistic Sciences* 18.1: 77-103.
- Kutsch-Lojenga, Constance. 2002. "Tone polarity in Fur". Paper presented at the 33rd Annual Conference on African Languages, Ohio University, Athens, Ohio.
- McCarthy, John, and Alan Prince. 1995. "Faithfulness and reduplicative identity". *Papers in Optimality Theory*, ed. by Jill Beckman, Laura Walsh Dickey & Suzanna Urbanczyk. GLSA: University of Massachusetts, Amherst. Pp. 249-384
- Moreton, Elliot. 1999. "Non-computable functions in Optimality Theory". ROA-364-1199.
- Newman, Paul. 1995. "Hausa tonology: complexities in an 'easy' tone language". *The Handbook of Phonological Theory*, ed. by John Goldsmith. Basil Blackwell: Cambridge, MA. Pp. 762-781.
- Nikiema, Norbert. 1980. *Moor Gulsg Sebre: Manuel de Transcription du Mooré*. Ouagadougou: Université de Ouagadougou.
- Odden, David. 1982. "Tonal phenomena in KiShambaa". *Studies in African Linguistics* 13: 177-208.
- Odden, David. 2000. "Overview of African tone systems". Paper presented at Tromsø Tone Symposium, University of Tromsø, Norway, June 5-8, 2000.

- Olawsky, Knut J. 1996. *An Introduction to Dagbani Phonology*. Arbeiten des Sonderforschungsbereichs 282, Nr. 76. Heinrich-Heine-Universität, Düsseldorf.
- Olson, Kenneth S. In press. *The Phonology of Mono*. SIL and University of Texas at Arlington Publications in Linguistics. Dallas: SIL and UTA.
- Picanço, Gessiane L. 2002. "Tone polarity as phonologically conditioned allomorphy in Mundurukú". Paper presented at Berkeley Linguistics Society meeting.
- Pulleyblank, Douglas. 1983. "Extratonicity and polarity". *Proceedings of the West Coast Conference on Formal Linguistics 2*, ed. by Michael Barlow, Daniel Flickinger & Michael Wescoat. Stanford Linguistics Association: Stanford. Pp. 204-216.
- Pulleyblank, Douglas. 1986. *Tone in Lexical Phonology*. Reidel: Dordrecht.
- Schuh, Russell G. 1978. "Tone rules". *Tone: A Linguistic Survey*, ed. by Victoria Fromkin. Academic Press: New York, NY. Pp. 221-256.
- Snider, K. 1999. *The Geometry and Features of Tone*. Dallas: SIL.
- Yip, Moira. 2002. *Tone*. Cambridge: Cambridge University Press.
- Zhang, Jie. 2000. "The phonetic basis for tonal melody mapping in Mende and elsewhere". Paper presented at the 19th West Coast Conference on Formal Linguistics, UCLA.
- Zhang, Jie. 2001. *The Effects of Duration and Sonority on Contour Tone Distribution - Typological Survey and Formal Analysis*. Los Angeles: University of California, Ph.D. dissertation.

A DIACHRONIC ANALYSIS OF NDUT VOWEL HARMONY*

Ursula Drolc
University of Cologne

Ndut is spoken in Senegal and belongs to the Cangin languages, a subgroup of the (West-) Atlantic languages (Sapir 1971). Unlike the other Cangin languages Noon, Laala and Saafi, Ndut, as well as closely related Palor, exhibits apparently bidirectional vowel harmony. However, a phonological analysis suggests that there are two independent phenomena that have to be kept separate: regressive vowel assimilation, which is probably a very archaic feature of the Atlantic languages, and progressive root-controlled harmony, which may be a contact-induced innovation. In Senegal, the dominant language is Wolof, a Senegambian language that is part of a different subgroup of Atlantic languages. As Wolof is the major medium of interethnic communication, most Ndut speakers are Wolof-bilingual. Consequently, contact-induced language changes are likely to appear in Ndut.

1. Outline

This paper attempts a diachronic analysis of the vowel harmony system of Ndut. Two different types of vowel harmony have to be distinguished: progressive root-controlled harmony, and regressive vowel harmony with [+ATR] as the dominant feature. Both processes are examined in detail and hypotheses regarding their origin are put forward. The diachronic analysis includes the reconstruction of the Proto-Cangin vowel system. Finally, there is a comparison of Ndut and Wolof

* I would like to thank David Odden and an anonymous reviewer for their valuable comments on an earlier version of this paper. I use the following grammatical abbreviations: RV = re-verse; CS = causative; imp. = imperative, pl. = plural; sg. = singular.

vowel harmony, and arguments are given to support the claim that progressive harmony is a contact-induced innovation.

Both languages, Ndut and Wolof, are classified as being part of the Northern Branch of the (West-)Atlantic languages. They belong to different subgroups: Wolof to the Senegambian languages and Ndut to the Cangin languages. The genetic relationship between these language groups is not very close.

Table 1: Language Classification: (West) Atlantic (Sapir 1971: 48)

I. Northern Branch:

A. S  n  gal Languages: **Wolof**, Seereer, Pulaar

B. Cangin Languages: **Ndut (Nd)**, Palor (P)

Saafi (S)

Noon (N), Laala (L)

C. Bak Languages

D. Eastern-S  n  gal-Portuguese-Guinea Languages

E. Nalu, Mbulungish

According to the lexicostatistical analysis of Sapir (1971: 47), the maximum score of common vocabulary between the two language groups is 18%. Atlantic languages share several typological features with Niger-Congo languages but their genetic unity is far from proven. Sapir (1971) and other scholars seriously question whether the different sub-groups of Atlantic languages are more closely related to each other than to other Niger-Congo languages:

Granted certain typological features common throughout, such as noun class systems and verbal extension suffixes, there is little that distinguishes the entire group in any obvious way. [p. 46]

2. Data and Fieldwork

Fieldwork was conducted in Senegal from January to March 2001 and from February to April 2002. The original purpose was to collect data for a comparative analysis of the five Cangin languages. Progressive vowel harmony occurs only in the languages Ndut and Palor, which have a high degree of mutual intelligibility.

To investigate this in more detail, data of Ndut were collected.¹ Five speakers (3 male and 2 female) were recorded. For each vowel a single word was recorded ten times and repeated once in a sentence. Various vowels involved in progressive vowel harmony and regressive vowel raising were also included. The data were recorded by a Sharp-Mini-Disc Recorder (ND-MT877H). Previous descriptions of the Cangin languages were included in the data base: the Ph. D. thesis on Palor by D'Alton (1987: 92, 142-143), the Ph. D. thesis on Noon by Soukka (2000: 57, 162f.), and the master's thesis on Ndut by Morgan (1996: 15). The rest of the data for Ndut (Nd), Laala (L) and Saafi (S) are from my own material.

3. Vowel Harmony in Ndut

In the Ndut vowel inventory, both length and [ATR] (advanced tongue root) are distinctive. The [-ATR] vowels outnumber the [+ATR] vowels. The very rare [+ATR] vowels [ə, əə] and [e, ee] appear to be secondary vowels resulting from regressive assimilation, as will be shown below. The central vowel [ə] is the [+ATR] counterpart of both [ɔ] and the low vowel [a].

(1) *Ndut vowels*

[-ATR]			[+ATR]		
i	ii	u uu	i	ii	u uu
ɛ	ɛɛ	ɔ ɔɔ	e	ee	o oo
a	aa		ə	əə	

Vowel harmony is a widespread phonological phenomenon in Africa. In vowel harmony systems, all (or a subset of) vowels in a defined domain such as the word or stem share a given distinctive feature, e.g. [±ATR]. According to their spreading behaviour under affixation, two vowel harmony systems can be distinguished: dominant harmony systems, and root-controlled systems (cf. Clements 2000: 135). In dominant harmony systems, a set of vowels with a specific feature (usually [+ATR]) is dominant and triggers the harmonisation of the other vowels in both roots and affixes. In root-controlled systems, the vowels of the root remain stable and the vowels of affixes assimilate to the root vowels. According to Stewart (1983), most of the dominant harmony systems can be found

¹ The data had been collected under the advice of Prof. Didier Demolin of the phonetic institute of the Université libre de Bruxelles, to whom I owe my greatest thanks. A detailed acoustic analysis of the vowels is intended for the future.

in Eastern Africa, whereas most of the root-controlled systems occur in Western Africa. Contrary to this previously assumed geographic distribution of vowel harmony types, Dimmendaal (2002) observes both root-control and feature dominance in the evolution of harmony systems of the Eastern African Nilotic languages. In the Western African language Ndut, both types of vowel harmony apparently occur. As the spreading processes may be both regressive and progressive, Diop Diagne (1989: 19) considers Ndut vowel harmony to be bidirectional. Morgan (1996: 16) states that vowel harmony in Ndut is completely regular. The bidirectional spreading of the dominant feature [+ATR] would leave neither disharmonic roots nor opaque or neutral vowels.

The following examples of the imperative paradigm in Ndut exemplify both phonological processes: root-controlled harmony of the alternating imperative singular suffix *-E*, dominant harmony triggered by the [+ATR] imperative plural suffix *-i*. In progressive root-controlled harmony, the stem or root vowel remains stable. The spreading direction is from left to right or from the stem to the affix. Regressive assimilation applies in the opposite direction, from right to left or from the suffix to the stem. The following table contains verb stems with various vowels of Ndut and their phonetic behaviour when both imperative suffixes are added. Because of the rare occurrence of the vowels [ə] and [e], only verb stems containing long vowels have been found. The verb stem [seen] is a loan word from Wolof.

(2) *Imperative paradigm in Ndut*

<i>Vowel</i>	<i>Stem</i>	<i>gloss</i>	<i>Imperative sg.</i>	<i>Imperative pl.</i>
a	[dap]	‘boucher’	[dap-ε]	[dəp-i]
a:	[daap]	‘apposer’	[daap-ε]	[dəəp-i]
ɔ	[wɔx]	‘garder’	[wɔx-ε]	[wɔx-i] ²
ɔ:	[fɔɔl]	‘sauter’	[fɔɔl-ε]	[fool-i]
ε	[εn]	‘porter sur la tête’	[εn-ε]	[en-i]
ε:	[pεεn]	‘causer’	[pεεn-ε]	[peen-i]
ə:	[dəək]	‘appeler’	[dəək-ε]	[dəək-i]
e:	[seen]	‘apercevoir’	[seen-ε]	[seen-i]
u:	[tuul]	‘cracher’	[tuul-ε]	[tuul-i]
u	[pun]	‘voler’	[pud-ε]	[pud-i]
ɪ:	[tɪɪl]	‘répondre’	[tɪɪl-ε]	[tɪɪl-i]
i:	[pii]	‘ramasser’	[piiʔ-ε]	[piiʔ-i]

² This might almost be heard as [wux-i].

In progressive harmony, the verb stem remains unaltered. The [ATR] value of the verb stem determines the realisation of the suffix *-E*. A [+ATR] vowel in the verb stem implies the surface realisation [e]. The suffix surfaces as [ɛ] when the verb stem contains a [-ATR] vowel. Because of this suffix-determining behaviour of the stem vowels, the [ATR] value appears to be an underlying feature of the lexicon. In this case root faithfulness would prevail over [ATR] alignment, in OT terms.

However, root faithfulness does not dominate ATR alignment when the imperative plural suffix *-i* is attached. Leftward [ATR] alignment prevails over root faithfulness when regressive assimilation applies to the stem vowels. However, not all stem vowels are involved in this alternation. Only the non-high [-ATR] vowels [a, ɔ, ɛ] are altered. There is no alternation of the [+ATR] vowels [ə, e, i, u], and also, interestingly, the high [-ATR] vowels [ɪ] and [ʊ] remain unaltered. Like umlaut phenomena, regressive vowel raising is triggered by a following suffix with the high [+ATR] vowel [i]. Five different suffixes with triggering [i] can be found in Ndut (see (30) below) but to the best of my knowledge there are no triggering suffixes containing the high vowel [u]. The high [-ATR] vowels [ɪ] and [ʊ] fail to trigger regressive harmony, and they undergo progressive harmony. There are no suffixes with underlying [+ATR] non-high vowels [e] and [o], so these vowels cannot be shown to cause harmony. The direction of the spreading is from left to right. Articulatorily, this raising process is motivated as anticipation of the high tongue-body position that is required for the pronunciation of the following high vowel. The result of this process is the emergence of raised surface vowels with the feature [+ATR]. As formalised in (3), high vowels remain unaltered.

- (3) V → [+ATR] / ____-i #
[-hi]

To define the phonological domain of this vowel raising process, verbs consisting of more than one syllable are required. Unfortunately, most of the verb roots in Ndut are monosyllabic. One polysyllabic verb is the derived verb *sem-anta-l-ɔx* 'spy'. The imperative plural suffix *-i* causes assimilation only of the preceding vowel, as in the following example where there is coalescence of the last two syllables, resulting in a lengthened vowel. This finding suggests that the domain of the vowel raising process is restricted to the preceding syllable. Another interpretation of this phenomenon is that only high [+ATR] vowels transmit regressive

harmony. According to this phonological condition, the derived vowel [ə] would block the reapplication of harmony.

- (4) $\text{s}\varepsilon\text{m-anta-l-}\text{ɔ}\text{x-i} \rightarrow \text{s}\varepsilon\text{mant}\text{əlii}$ ‘spy! (imp. pl)’
 $\text{s}\varepsilon\text{m-anta-l-}\text{ɔ}\text{x-}\varepsilon \rightarrow \text{s}\varepsilon\text{mant}\text{ə}\varepsilon\varepsilon$ ‘spy! (imp. sg)’

4. **Reconstruction of the Proto-Cangin Vowel System**

A diachronic analysis attempts to trace language developments in order to reconstruct the common proto-language of genetically related languages. The Cangin languages form such a genetic unit. For a better understanding of the reconstruction of the proto-Cangin vowel system, an overview of the synchronic vowel inventories of the Cangin languages is given below. The data for Saafi and Laala come from my own field notes.

(5) *Saafi*

i	ii	u	uu
ɛ	ɛɛ	ɔ	ɔɔ
a	aa		

(6) *Palor* (D’Alton 1987:73)

[-ATR]		[+ATR]	
i	u	i	u
ɛ	ɔ		
a		(ə)	

(7) *Laala*

[-ATR]		[+ATR]	
i	ii	u	uu
ɛ	ɛɛ	ɔ	ɔɔ
a	aa	ə	əə

(8) *Noon* (Soukka 2000:33)

[-ATR]		[+ATR]	
i	ii	u	uu
ɛ	ɛɛ	ɔ	ɔɔ
a	aa	ə	əə

Most of the Cangin languages distinguish at least eight different vowels. Their vowel inventories include a central vowel and exhibit a contrast between high [-ATR] ([ɪ, ʊ]) and [+ATR] vowels ([i, u]). Only Saafi has a five vowel system with neither a central vowel nor a phonemic [ATR] contrast between high vowels. The obvious merger of the high vowels will be marked in the tables by the majuscule letters I and U.

There are two closely related language pairs: Noon/Laala and Ndut/Palor. In the lexicostatistic word comparison conducted by Williams (1994: 51) the languages of each pair have more than 80% shared vocabulary. The major differences in the vowel inventories of these closely related languages appear to be mostly due to the different phonemic interpretations of the authors. In most of the Cangin languages, vowel length is a distinctive feature, although D'Alton (1987) considers long vowels to be biphonemic combinations of two short vowels. However, the fact that phonetically long vowels do occur in Palor, and the regular sound correspondence to other long vowels in cognates of the other Cangin languages suggest that long vowels should also be given phonemic status in Palor. A phonetic difference between Palor and the other languages is the realisation of the central vowel as [ɐ]. The major difference between the vowel inventories in Noon and Laala lies in the phonemic status of the [+ATR] vowels [e] and [o], which occur very rarely in both languages. In these rare occurrences they may be identified as allophones of /ɛ/ and /ɔ/ resulting from regressive assimilation as shown below.

The reconstruction of the following proto-Cangin vowel system (9) is based on the comparative evidence given below and in the appendix.

(9) *Proto-Cangin Vowel System*

[-ATR]		[+ATR]	
(*ɪ) *ɪɪ	(*ʊ) *ʊʊ	*i *ii	*u *uu
*ɛ *ɛɛ	*ɔ *ɔɔ	*e (*ee)	*o (*oo)
*a *aa			

The Proto-Cangin vowel system consists of seven to nine long and short vowels. For the sake of presenting a balanced vowel system (cf. Crowley 1994: 98), some proto-phonemes are in parentheses, indicating a lack of convincing comparative evidence. The short and long vowels [a, ɔ, ɛ, i, u] exhibit relative sound stability in their diachronic development. Each of these vowels occurs in at least four cognates (see Appendix). There are regular sound correspondences of [ɛ] ~ [ɪ] and [ɔ] ~ [ʊ] which lead conclusively to the reconstruction of a phonemic

[ATR] contrast between mid vowels. These reconstructed mid [+ATR] vowels have no reflexes in the daughter languages, which exhibit no [ATR] contrast between mid vowels. However, comparative data containing high [-ATR] vowels is scarce. No more than two cognate words occur in my data (10, 11).

(10) *Short u*

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
ḡux	ḡux	ḡUx	ḡuʔ	baay	‘dog’
fu	fu	fU	fu	fu	‘2sg.’

(11) *Short ɪ*

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
wɪc	wɪc	wɪc	wɪʔ	wɪʔ	‘horn’
ɲɪf	ɲɪf	ɲɪf	ɲɪf	ɲɪf	‘blood’

More common is the following pattern of sound correspondence. High [-ATR] vowels in *Ndut* and *Palor* correspond to mid [-ATR] vowels in *Noon* and *Laala*. In six cognate words the vowel [u] in *Ndut* and *Palor* corresponds to the vowel [ɔ] in *Noon* and *Laala*. Similarly, there are regular sound correspondences between the front vowel [ɪ] in *Ndut* and *Palor* and the mid vowel [ɛ] in *Noon* and *Laala*. *Saafi* is posited as genetically intermediate between these two subgroups and shares either the high [-ATR] vowel [ɪ] with *Ndut* and *Palor* or the mid vowel [ɔ] with *Noon* and *Laala*.

(12) *Sound correspondence u ~ ɔ*

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
nuf	nuf	nɔf	nɔf	nɔf	‘ear’
xul	xul	xɔr	xɔl	xɔl	‘star’
yux	yux	yɔx	yɔx	yɔx	‘bone’
lux	lux	rɔxɔy	lɔy	lɔxɔy (lɔy)	‘short’
nɪŋ	nɪŋ	nUŋ	nɔŋ	nɔŋ	‘hole’
ut	ut	xUtʔ	xɔr	xɔʔ	‘long’

(13) *Sound correspondence* $\text{ɪ} \sim \text{ɛ}$

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
(tal-)kɪlɪk	tal-kɪlɪk	kɪdɪk	kɛdɛk	kɛdɛk	‘tree’
dɪɲ	dɪn	dɪlɪɲ	dɛn	dɛɲ	‘louse’
mɪsɪp	mɪsɪp	mɪsɪp	mɛsɪp	mɛsɪp	‘sauce’
mɪsɪk	mɪskat	mɪsɪk	-mɛsɪk	-mɛsɪk	‘suffer’

These regular sound correspondences indicate a vowel shift in the development of the daughter languages. The major problem is to determine the direction of the sound change. Theoretically, three different hypotheses are possible:

I. The mid [-ATR] vowels of Noon and Laala are retentions of the proto-phonemes $^*\text{[ɛ]}$ and $^*\text{[ɔ]}$. Vowel shift occurs in Ndut and Palor:

$$^*\text{ɛ} > \text{ɪ} \text{ (Nd, P)}$$

$$^*\text{ɔ} > \text{u} \text{ (Nd, P)}$$

II. The high [-ATR] vowels in Ndut and Palor are retentions of the proto-phonemes $^*\text{[ɪ]}$ and $^*\text{[u]}$. In Noon and Laala $^*\text{[ɪ]}$ and $^*\text{[u]}$ shift to $^*\text{[ɛ]}$ and $^*\text{[ɔ]}$ and merge with the already existing mid vowels:

$$^*\text{ɪ} > \text{ɛ} \text{ (N, L)}$$

$$^*\text{u} > \text{ɔ} \text{ (N, L)}$$

III. The proto-language contains mid [+ATR] vowels $^*\text{[e]}$ and $^*\text{[o]}$ that shift either to $^*\text{[ɪ]}$ and $^*\text{[u]}$ in Ndut and Palor or to $^*\text{[ɛ]}$ and $^*\text{[ɔ]}$ in Noon and Laala:

$$^*\text{e} > \text{ɪ} \text{ (Nd, P)}$$

$$^*\text{e} > \text{ɛ} \text{ (N, L)}$$

$$^*\text{o} > \text{u} \text{ (Nd, P)}$$

$$^*\text{o} > \text{ɔ} \text{ (N, L)}$$

The major argument against the first hypothesis is the strong evidence of sound stability of the [-ATR] mid vowels $[\text{ɛ}, \text{ɛɛ}, \text{ɔ}, \text{ɔɔ}]$ in the diachronic development. The comparative wordlists (14-17) contain at least four cognate words for each mid [-ATR] vowel. Thus, a rule would be required to separate the shifting from the non-shifting mid vowels. By the standard theory of regularity of sound change, the reconstruction of both stable $[\text{ɛ} \text{ ɔ}]$ and variable $[\text{ɛ} (\text{ɪ}) \text{ ɔ} (\text{u})]$ as the same historical phoneme, without any rule conditioning, is not possible.

(14) *Short ε*

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
ḡḡḡ	(kḡḡ)	(baay wf)	-ḡḡḡ	-ḡḡḡ	‘take’
yḡḡ	yḡḡ	yḡḡḡ	(-yḡḡḡ)	-yḡḡ?	‘push’
yḡḡ	yḡḡ	jḡḡ	-yḡḡ	-yḡḡ	‘laugh’
kḡl	kḡl	kḡḡḡ	-kalax	-kḡlḡḡ	‘understand’

(15) *Long ε*

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
kḡḡḡ	kḡḡḡ	kḡḡḡ	kḡḡḡ	kḡḡḡ	‘fall’
nḡḡ?	nḡ?	nḡḡ	nḡḡḡ	nḡḡḡ	‘sleep’
ḡḡḡ	(xḡḡ)	wḡḡḡ	wḡḡḡ	wḡḡḡ	‘throw’
tḡḡḡ	tḡḡ	tḡḡḡ	tḡw(ḡḡ)	tḡḡḡ	‘show’
yḡḡḡ	yḡḡ	yḡḡḡ	yḡḡḡ	yḡḡḡ	‘sing’

(16) *Short ɔ*

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
kḡḡ	kḡḡ	kḡḡ	kḡḡ	kḡḡ	‘foot, leg’
lḡḡ	lḡḡ	rḡḡ	lḡḡ		‘buy’
tḡḡ	tḡḡ	tḡḡ	fḡḡḡḡḡ-	tḡw	‘rain’
gḡḡ	(yḡḡḡḡḡ)	(labrif)	gḡḡ	gḡḡḡ	‘snake’
tḡḡḡḡ	sḡḡ	ḡḡḡḡḡ	pḡḡḡḡ	pḡḡḡḡ	‘seed’
ḡḡḡḡ	ḡḡḡḡḡḡ	mḡḡḡḡ	mḡḡḡḡ	mḡḡḡḡ	‘round’
nḡḡ	nḡḡ	nḡḡ	(ḡḡḡ)	nḡḡ	‘rot’

(17) *Long ɔ*

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
lḡḡ?	lḡḡ	rḡḡ	lḡḡḡ	lḡḡḡ	‘stomach’
ḡḡḡḡ	ḡḡḡḡ	ḡḡḡḡ	ḡḡḡ	ḡḡḡḡ	‘calf’
nḡḡḡḡ	nḡ(ḡḡ)?ḡḡ	nḡḡḡ	xḡḡ	xḡḡḡ	‘deep’
sḡḡ	sḡḡ	sḡḡḡ	sḡḡḡḡḡ	sḡḡḡ	‘cold’

For the same reason, the second hypothesis that presumes the proto-phonemes *[ɪ] and *[ʊ] is also not very plausible. However, high [-ATR] vowels in cognate words of Noon and Laala occur very rarely. These rare occurrences could be retentions but they could also be due to internal borrowings. The area where the Cangin languages are spoken is relatively small in size. As the greatest

distance does not exceed 100 miles, contact between speakers of different Cangin languages is likely to occur.

The following arguments support the third hypothesis. First, no rule would be required to explain apparent exceptions of sound change, such as the assumed borrowing of words containing /ɪ u/ in Noon and Laala. Second, the principle of ‘sound naturalness’ indicates that the mid [+ATR] vowels /e o/ are phonetically closer to either of the vowel pairs /ɛ ɔ/ and /ɪ u/ than these two [-ATR] vowel pairs are to each other. Third, the reconstruction of [-ATR] /ɪ u/ in Ndut and Palor as [+ATR] /e o/ in the proto-language could provide an explanation why these vowels are not affected by regressive harmony. However, this hypothesis would violate the principle of simplicity in historical reconstructions by reconstructing two proto-phonemes *[e] and *[o] that do not exist in most of the phonological systems of the daughter languages. The [+ATR] vowel [e] has phonemic status only in Ndut. Still, it remains a marginal sound that only occurs in very few words. Phonetically, the [+ATR] vowels may occur as allovariants of the mid vowels [ɛ] and [ɔ] in Ndut, Laala and Noon.

Interestingly, the comparative lists give evidence for sound stability of the long high [-ATR] vowels. Only one cognate word exhibits the same sound correspondence of long vowels. Phonetically, the [-ATR] long vowels /ɪɪ uu/ can barely be distinguished from the [+ATR] long vowels /ee oo/. Phonologically, the vowels in the words of Ndut and Palor given below can clearly be identified as [-ATR] vowels by the progressive harmony of the definite article.

(18) *Long ɪ*

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
tɪɪ	tɪɪ	tɪk	tɛɛk	tɛɛk	‘name’
mɪɪs	mɪɪs	mɪɪs	mɪɪs	mɪɪs	‘milk’
sɪɪk	sɪɪk	sɪɪk	sɪɪk		‘cock, buck’ ³
yɪɪn	yɪɪn	yɪɪn	yɪɪn		‘guinea fowl’
yɪɪl	yɪɪl	yɪɪl	(kujabɛ?)		‘chick’

³ The term means ‘male animal’ but its use is restricted to ‘buck’ and ‘cock’.

(19) *Long vowel u*

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i> ⁴	
suul	suul	sUUr	suul		‘vulture’
luuf	luuf	ndUUf	luuf	luuf	‘bush’
luun	luun	rUUn	luun		‘witch’
(ndut)		tUUy	tuy	tuuy	‘hut’
nuus	nuus	ɲUUs	ɲuus		‘darkness’

No comparative data evidences stable sound development of Proto-Cangin *[e] to Ndut [e], but regressive harmony may account for the emergence of the [+ATR] mid vowel [e] in Ndut. If there is a second syllable in cognate words, it often contains a high vowel. In the word ‘bug’ there is sound correspondence of [e] with [ə] in Laala and [a] in Saafi. Interestingly, the same pattern of sound correspondence is exhibited in the Wolof loanword *aréen* [areen] ‘peanut’ which appears to be a phonologically perfectly adapted loanword.

(20) *Sound correspondences of e*

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	
teɲi	tɛɛɲ	taapɪn	təɲiɪn	‘bug’
ereɲ	ɛɛɛn	aɛɛn	əɪɲ	‘peanut’

Similarly, regressive harmony accounts for the emergence of the central vowel. In the comparative wordlist (21) the central vowel may correspond to any non-high vowel in cognates of other Cangin languages. The occurrence of a high vowel in the second syllable in at least one of the cognate words suggests that the central vowel is the result of regressive harmony. Consequently, the central vowel was not included in the reconstruction.

(21) *Sound correspondences of ə / ʊ*

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
pənis	pənis	panɪs	pənis		‘horse’
cəɸ	cəɸu	caafU	cəɸu	cəwuu	‘fly’
səəgu		saəŋgU	səəgu		‘shade’
fənuf	fən	fɪn	fən	fən	‘hair’

⁴ From Soukka (2000: 102).

5. Regressive Harmony

Regressive vowel harmony is a common phenomenon in the Cangin languages. The following table gives an overview of suffixes triggering regressive harmony. Two of these suffixes occur in all Cangin languages. They are safe candidates for reconstruction: reversive **-is* and causative **-id*. However, there is variation in the realisation of the adjectiviser and the experiential suffix even in the closely related language pairs Ndut/Palor and Noon/Laala. Note that in Noon and Laala there are also suffixes with the high vowel *u* triggering regressive assimilation.

(22) Suffixes triggering regressive assimilation⁵

Suffix	Function	Language
-is	reversive	N, L, Nd, P, S
-id	causative	N, L, Nd, P, S
-id/?	adjectiviser	N, Nd (= P id; L it/?)
-id	experiential	Nd (=P id)
-i	imperative pl.	Nd, P
-Ci:	1. pl. excl.	N
-Cu:	2. pl.	N
-Cu	2. pl.	L

In Saafi, high [+ATR] and [-ATR] vowels merged. The missing contrast produced homophonous suffixes for the reversive **-is* and the repetitive **-is*. Nevertheless, when affixing the reversive suffix *-is* there is regressive harmony applying only to mid vowels. The other vowels are not affected by regressive harmony:

(23) Homophonous Suffixes in Saafi

Verb stem	Derived form	Reversive
tək 'attacher'	tək-Is	'detacher'
lɛm 'plier'	lɛm-Is	'deplier'
raŋ 'fermer'	raŋ-Is	'ouvrir' (porte)
kUn 'fermer'	kUn-Is	'ouvrir' (couvercle)

To avoid the emergence of homophonous verb forms of the reversive and the repetitive, the Saafi dialect of Kirène developed the suffix *sitɔ* for the repetitive.

⁵ C = homorganic consonant.

The following tables provide comparative evidence of the vowel behaviour after the affixation of a high [+ATR] vowel. They contain examples for each vowel separately. As the causative and reversive derivation are not fully productive, the data is scarce. When undergoing regressive vowel assimilation the vowel /a/ is realised as a central vowel, [ə] or [ɐ], in Palor:

(24) *Regressive assimilation* [a] → [ə], [ɐ] / __-i

<i>Basic form</i>	<i>Derived form</i>	<i>Function</i>	<i>Language</i>
bap 'suck'	bəp-id 'breastfeed'	CS	Nd.
bap 'suck'	bɐp-id 'breastfeed'	CS	P
bap 'suck'	bəp-id 'breastfeed'	CS	L
bap 'suck'	bap-Id 'breastfeed'	CS	S
nam 'eat'	nəm-id 'feed'	CS	Nd
nam 'eat'	nɐm-id 'feed'	CS	L
nam 'eat'	nəm-i? 'feed'	CS	N
jaŋ 'learn'	jəg-i? 'teach'	CS	N
jaŋ 'learn'	jaŋ-Id 'teach'	CS	S
jakat 'run'	jəkət-id ⁶ 'cause to run, drive'	CS	P
dap 'plug'	dəp-is 'unplug'	RV	Nd
laŋ 'close'	ləg-is 'open'	RV	N, L
raŋ 'close'	raŋ-is 'open'	RV	S
laaŋ 'put on the fire'	ləæg-is 'remove from the fire'	RV	N
kal 'take'	kəl-is 'throw away'	RV	P

There is variation in the output of the mid vowel [ɔ] undergoing this process. In Noon and Laala the surface vowel [o] appears. In Ndut and Palor the counterpart is the central vowel [ə, ɐ], although in the Ndut imperative paradigm the outcome of regressive harmony would be [o]. This variation could be explained as historical restructuring of regressive harmony. The causative and the reversive would represent an earlier stage of the language when the harmonic relations were lexically frozen.⁷ In contrast, the fully productive imperative suffixes appear to be an innovation that can only be found in Ndut and Palor.

⁶ In this example from D'Alton (1987: 142) both preceding syllables are involved in the assimilation process. Probably, in P the domain of the assimilation is not restricted to the preceding syllable. Another possible interpretation of this phenomenon could be that rapid speech caused the progression of the assimilation.

⁷ For this comment I have to thank once again David Odden.

(25) *Regressive assimilation* [ɔ] → [ə, ɐ], [o] / ____ -i

<i>Basic form</i>	<i>Derived form</i>	<i>Function</i>	<i>Language</i>
səs 'be/become cold'	səsɪd 'chill, cool'	CS	Nd
sɔɔs 'be/become cold'	soos-ɪd 'chill, cool'	CS	L, N, S
yɔɔn 'learn'	yəəd-ɪd 'teach'	CS	Nd
yɔɔn 'learn'	yæəd-ɪd 'teach'	CS	P
lɔm 'buy'	lom-ɪd 'buy for s.o.'	CS	N
pɔn 'fold'	pon-ɪs 'unfold'	RV	Nd
pɔn 'fold'	pon-ɪs 'unfold'	RV	L
pək 'tie'	pək-ɪs 'untie'	RV	P
pək 'tie'	pək-ɪs 'untie'	RV	L
pək 'tie'	pək-ɪs 'untie'	RV	N

The following table contains data for regressive harmony applying to the stem vowel [ɛ] in Noon, Laala and Ndut. There is variation in the assimilation of the stem vowel [ɛ] that may either result in [ə] or [e] in Noon (cf. Soukka 2000: 162f.). This variation could plausibly be explained by attributing these vowels to different proto-phonemes *[e] and *[ɛ]. Rule (26) applies in the derived forms of (27).

(26) e → e / ____ -i

ɛ → ə / ____ -i

(27) *Regressive assimilation* [ɛ] → [ə], [e]

<i>Basic form</i>	<i>Derived form</i>	<i>Function</i>	<i>Language</i>
hɛj 'fight'	həj-ɪs 'separate fighters'	RV	N [:163]
lɛɛx 'finish'	leex-ɪd 'finish something'	CS	N [:162]
lɛm 'ranger à longueur'	lem-ɪs 'déranger'	RV	L
sɛɛb 'pêcher'	seeb-ɪd 'avoir pêché une fois'	EXP	Nd
pɛɛn 'causer'	peen-ɪd 'avoir causé une fois'	EXP	Nd

According to D'Alton (1987) the [-ATR] vowels [ɛ] and [ɔ] have no [+ATR] counterpart in Palor. They behave neutrally if they follow a [+ATR] vowel. Preceding a high [+ATR] vowel, however, they evidence harmony and are altered to [i] and [ə] as a result of leftward vowel harmony. The unusual alternation of the mid vowel [ɛ] with the high vowel [i] suggests that she has probably mistaken [i] for [e] which does not occur in her Palor vowel system:

Les tendues peuvent être suivies, au sein du mot, par les voyelles /e/ [ɛ] et /o/ [ɔ]. Toutefois, lorsque /e/ [ɛ] et /o/ [ɔ] sont suivies d'une voyelle tendue ([+ATR]), elles se réalisent respectivement /i/ et /ë/. [p. 93]

In (28), high [-ATR] vowels in Noon and Laala do not undergo regressive assimilation. This exclusion of high [-ATR] vowels from the assimilatory process might be an ancient phenomenon. As Noon and Laala are not closely related to Ndut the restriction of this phonological process to non-high vowels could even be reconstructed in the proto-language.

(28) *No regressive assimilation of the [-ATR] vowels /i/ [ɪ] and /u/ [ʊ]*

<i>Basic form</i>		<i>Derived form</i>		<i>Function</i>	<i>Language</i>
nɪk	'be afraid'	nɪk-iʔ	'frighten'	CS	N
yɪŋ	'sit'	yug-iʔ	'make sit'	CS	N
yun	'learn'	yud-iʔ	'teach'	CS	L
tum	'do'	tum-iʔ	'make do'	CS	L
fɪŋ	'discard'	fɪy-iʔ	'make discard'	CS	L
yɪŋ	'smell, feel'	yɪŋ-iʔ	'make smell, feel'	CS	L

Similar cases of regressive vowel harmony can also be found in two neighbouring contact languages, Pulaar and Wolof. Both languages belong to the Senegambian subgroup of Atlantic languages. In Pulaar, regressive vowel assimilation leads to the emergence of [+ATR] mid vowels on the surface (Archangeli & Pulleyblank 1994: 134). The Pulaar vowel system consists of five vowels [u, i, e, o, a], so [ATR] is not a contrastive feature in this system. Its values are completely predictable: a [+high] vowel is advanced and a [+low] vowel retracted. The tongue root values of the mid vowels are determined by the [ATR] property of the following vowel. High vowels imply [+ATR] on the preceding syllable. All non-high vowels imply [-ATR]. Thus, mid vowels exhibit an [ATR] contrast at the surface that "is entirely derivative and need not be reflected in underlying representations" (Archangeli & Pulleyblank 1994: 137). Many verb derivation suffixes contain high vowels: among others, the reversive *-it/-ut* and the causative *-in* (cf. Arnott 1970: 334).

An obviously cognate reversive suffix *-i* triggering leftward vowel raising⁸ can also be found in Wolof (Ka 1994: 112). In the examples below either [-ATR] vowels become fronted without an alternation in their [ATR] value (*a* → *ε*), or they become raised and fronted (*ə* → *i*).

- | | | | | |
|------|----------------------|---|--------|----------------|
| (29) | samp ‘to plant’ | → | səmp-i | ‘to take out’ |
| | takk ‘to tie’ | → | təkk-i | ‘to untie’ |
| | gəmm ‘to close eyes’ | → | gimm-i | ‘to open eyes’ |

The common occurrence of the triggering reversive suffix in Fula, Wolof and Ndut could either be interpreted as an incidence of areal convergence or as common Atlantic inheritance. As the reversive derivation is lexically restricted to a few verbs it is unlikely to be borrowed. Thus, the reversive suffix containing the high vowel [i] appears to be a cognate suffix that might be reconstructed for Proto-Atlantic, if such a genetic unit existed.

6. Progressive Vowel Harmony

Progressive harmony⁹ occurs only in Ndut and Palor. The [ATR] property of the affix depends on the [ATR] property of the verb stem. A [+ATR] verb stem induces [+ATR] in the suffix vowel; a [-ATR] verb stem induces a [-ATR] vowel. Consequently, alternating suffixes appear. The following table (30) gives an overview of alternating suffixes in both languages without claiming to be exhaustive. The Palor data come from D’Alton (1987: 144).

⁸ This process can be accompanied by the lengthening of the stem vowel and the gemination of the stem final consonants Ka (1994: 112).

⁹ Hyman (2002: 10) claims that directionality of vowel harmony “is fully (or mostly) predictable based on one or more factors concerning the potential triggers and/or targets”. In stem- or root-controlled systems the root is the trigger and the affixes represent the target. Consequently, languages with suffixes exhibit rightward harmony whereas languages with prefixes have leftward harmony. As suffixation is more common than prefixation in languages it is supposed that there is a left-to-right bias in vowel harmony.

(30) *Alternating Suffixes in Ndut¹⁰ and Palor*

<i>Ndut</i>	<i>Function</i>	<i>Palor</i>
-id, -ɪd	‘benefactive’	-id, -ɪd
-id	‘experiential’	-id, -ɪd
-il, -ɪl	‘repetitive’	-il, -ɪl
-u, -ʊ	‘passive’	-u, -ʊ
-ɛ, -e	‘imperative singular’	-ɛ
	‘achèvement de l’action’	-kin, -kin
-ɔx, -əx	‘reciprocal’	-ɔx, -əx
-ɔx, -əx	‘agentive’	
-aʔ, -əʔ	‘transitive’	-aʔ, -əʔ
	‘transitive’	-al, -əl
-aʔ, -əʔ	‘habitual’	-an, -ən
-ant-, -ənt-	‘reciprocal’	-ante, -ente
	‘faire légèrement’	-as, -əs
-aat, -əət	‘iterative’	

The suffixes *-Aat* ‘iterative’, *-Al* and *-Ant* ‘reciprocal’ appear to be borrowed from Wolof. Other suffixes share cognates with Noon and Laala. These cognate suffixes contain [-ATR] vowels such as *-u* ‘passive’, *-ɔx* ‘pluractional’ and the repetitive *-ɪs* that corresponds to the alternating suffix *-Il* in Ndut.¹¹ When affixed to [+ATR] verb stems, no alternation occurs. Compare the following Laala and Noon verb stems containing high [+ATR] vowels. The Noon examples come from Soukka (2000):

(31) Repetitive -ɪs:	gur-ɪs	‘cut again’
	lin-ɪs	‘cultivate again’
	tiid-ɪs	‘walk again’ [S:220]
Reciprocal -ɔx:	lin-ɔx	‘cultivate’ [S:239]
	gur-ɔx	‘cut into two pieces’

¹⁰Morgan (1996: 105) mentions additionally the following alternating suffixes: *-Id* ‘personal’, *-Is* ‘intensive’, *-Ad* ‘manner’.

¹¹There are more examples to justify the regular sound correspondence *s~l*: *waas* (S, N, L) ~ *waal* (Nd, P) ‘chemin’; *wəs* (N, L) ~ *wəl* (Nd, P) ‘envoyer’; *suusuus* (S, N, L) ~ *suul* (Nd, P) ‘noir’.

Perfect -ɪn:	yud-ɪn	‘woken up’
	muy-ɪn	‘got-lost’
	liif-ɪn	‘got-full’
	pud-ɪn	‘flown’
	dul-ɪn	‘hit’
	kug-ɪn	‘bent’ [S:230]
	ɔg-ɪn	‘reddened’
	og-ir-ɪn	‘made red’

The alternating suffixes correspond to non-alternating suffixes with [-ATR] vowels in Noon and Laala. They contrast to non-alternating suffixes containing the triggering high [+ATR] vowels such as the reconstructed reversive **-is* and the causative **-id*. These correspondences lead to the conclusion that suffixes with alternating vowels can be derived from underlying [-ATR] vowels. Alternating affixes in Nilotic languages exhibit a similar phonological development. Following the well-established principle of archaic heterogeneity in morphological reconstruction, Dimmendaal (2002: 167) claims that these alternating affixes should be traced back into the proto-language as non-alternating suffixes with either inherently [+ATR] or [-ATR] vowels.

In Ndut and Palor, the definite article also follows the harmonic principles of the root. Nouns with [+ATR] vowels take the definite article *-ə/-e*; nouns with [-ATR] vowels, the definite article *-a*. The definite article is preceded by one of the concord prefixes *Ø-, f-, k-, m-* or *y-*.

(32) *Alternating definite article -a/-ə in Ndut*

[-ATR]		[+ATR]	
af-a	‘the head’	kəəm-ə	‘the public place’
lɔɔʔ-a	‘the stomach’		
kɛɛɲ-a	‘the liver’	ner-ə	‘the cloud’
ɡɪn-a	‘the village’	il-ə	‘the eye’
kun-a	‘the finger’	pug-ə	‘the front’

(33) *Alternating definite article in Palor* (D'Alton 1987: 104)

[-ATR]		[+ATR]	
taan-a	'l'uncle maternel'	pənis-fe	'le cheval'
kɔj-a	'l'ami'		
yɛɛg-a	'le chant'		
ɡin-a	'le village'	yiin-ɐ	'la hâche'
xul-ya	'les étoiles'	bug-ɐ	'la bouche'

As the same alternation of the definite article can be found in the major contact language Wolof, the next claim will be that progressive harmony is a contact-induced innovation. To illustrate Wolof harmony, (34) presents alternating definite and demonstrative markers in Wolof (Ka 1994: 50). The direction of the spreading process is from left to right. Indefinite articles precede the noun and do not alternate. Definite articles and demonstratives occur after the noun. They alternate if they do not contain high vowels or the long low vowel:

(34) *Alternating definite and demonstrative markers in Wolof* (Ka 1994: 50)

[+ATR]	gloss ¹²	[-ATR]	gloss
ab jigeen	a woman	ab xalɛ	a child
jigeen ji	the woman (close)	xalɛ bi	the child (close)
jigeen jə	the woman (away)	xalɛ ba	the child (away)
jigeen jɔlɛ	that woman	xalɛ balɛ	that child
jigeen jee	that woman	xalɛ bɛɛ	that child

The correspondence of the alternating definite articles -ə/-a in both languages is evident. The other Cängin languages Noon and Laala exhibit alternation of either of the definite articles -ɪɪ (proximal) or -aa (distal). Compare the following [+ATR] noun stems of Laala: *xuul-aa* 'the Palmyra palm', *jiij-aa* 'the ant', *lup-aa* 'the sting', *tiŋ-aa* 'the headpad'. The sound correspondence of the distal definite article -aa in Noon and Laala with the alternating definite article -ə/-a in Ndut could imply the common origin of both markers. But even in that case, the possibility of contact-induced emergence of progressive harmony in Ndut and Palor can not entirely be excluded.

The intense language contact with Wolof is further indicated by other structural borrowings such as the plural class marker and the demonstrative. In

¹²For many demonstratives in Wolof it is impossible to find an appropriate translation into English.

Ndut and Palor there is only one plural class marker *y-* that corresponds formally and functionally to the overall plural class marker *y-* in Wolof. The overall plural class markers for the majority of nouns in the other Cangin languages is *c-*. In Saafi, this is the only class marker for plural nouns. Only Noon and Laala exhibit another remnant plural class *t-* which contains just a few nouns.

Whereas the definite article in Ndut obligatorily takes a class concord prefix, demonstratives exhibit only a number distinction. All singular nouns invariably take the demonstrative concord *b-*. For plural nouns the demonstrative concord is *y-*. Comparison with demonstratives of the other Cangin languages demonstrates that the borrowing of these prefixes from Wolof is the most plausible explanation for their occurrence in Ndut and Palor. The following table represents the different demonstratives and their concord prefixes.

(35) *Comparison of demonstratives*

<i>Demonstrative</i>	<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	<i>Wolof</i>
proximal	-ε(x)	-εε	-ii	-ii	-ii	-ii/-ile
medial	-a	-in	-um	-aa	-aa	-ee/-ale
distal	-In	-in-in	-εn	-uuni	-uu-nεε	
concord	<i>b-</i> (sg)	<i>b-</i> (sg)	∅- (sg)	∅-, <i>f-</i>	∅-, <i>f-</i>	<i>b-</i> , <i>k-</i> (sg)
	<i>y-</i> (pl)	<i>j-</i> (pl)	<i>c-</i> (pl)	<i>c-</i> , <i>t-</i>	<i>c-</i> , <i>t-</i>	<i>y-</i> , <i>n-</i> (pl)

In Wolof, the class concord system consists of two major concord classes, with the prefixes *b-* for singular and *y-* for plural and a few remnant concord classes. Thus, most demonstratives in Wolof take either the concord prefix *b-* for singular nouns or *y-* for plural nouns. In Saafi, demonstratives exhibit only a number distinction, but the prefixes can be deduced from the concord prefixes ∅- for the singular and *c-* for the plural. In Noon and Laala, languages with more elaborate concord systems, there is a greater variety of concord markers for the demonstratives: six singular concord prefixes ∅-, *f-*, *m-*, *k-*, *p-*, *j-* and two plural concord prefixes *c-* and *t-*. But even in these languages, the majority of nouns are assigned either to class ∅- in the singular or to class *c-* in the plural.

A phonological comparison of Wolof and Ndut reveals major differences in the vowel inventory and the mechanisms of the harmony systems. According to Ka (1994: 11), Wolof distinguishes eight vowels that can be either long or short, except for the central vowel [ə] which can only be a short vowel. The [+ATR] vowels outnumber the [-ATR] vowels and there is no contrast between high [+ATR] and [-ATR] vowels.

(36) *Wolof vowels*

[+ATR]	[-ATR]
i, ii	
u, uu	
e, ee	ɛ, ɛɛ
o, oo	ɔ, ɔɔ
ə	a, aa

Ndut vowels

[+ATR]	[-ATR]
i, ii	ɪ, ɪɪ
u, uu	ʊ, ʊʊ
e, ee	ɛ, ɛɛ
ɔ, ɔɔ	
ə, əə	a, aa

The Ndut vowel system appears to be more symmetrical than the Wolof system. Almost every [+ATR] vowel has a [-ATR] vowel as a counterpart, except for the mid vowel ɔ which shares the central vowel as [+ATR] counterpart with the low vowel *a* as shown above. In Wolof, the high vowels are always [+ATR] and the long low vowel *aa* has no long [+ATR] counterpart.

Wolof vowel harmony can briefly be described as follows: within a word, vowels usually agree for [ATR] except for the two high vowels and the long low vowel which are the vowels missing a [-ATR] or [+ATR] counterpart. The direction of the spreading process is from right to left or from the root to the suffix, as the functional load of Wolof is primarily expressed by suffixes or postpositional elements such as the definite markers shown above.

Rightward harmony is also attested within verb derivation. Suffixes containing mid or short low vowels do alternate. Non-alternating suffixes contain either high vowels or the long low vowel. The agentive suffix *-kat* does not alternate either.

(37) *Alternating and Non-alternating Suffixes in Wolof* (Ka 1994: 13)

<i>Alternating suffixes</i>	<i>Meaning</i>	<i>Non-alternating suffixes</i>	<i>Meaning</i>
-e/-ɛ	‘instrumental locative’	-i	‘reversive’
-le/-lɛ	‘participant’	-i	‘motion away’
-te/-tɛ	‘physical or moral state’	-in	‘manner’
-ee/-ɛɛ	‘temporal conditional’	-it	‘residual’
-eel/-ɛɛl	‘conceptual’	-si	‘motion towards’
-leen/-lɛɛn	‘2 pl. imperative’	-u	‘reflexive- neutropassive’
-o/-ɔ	‘nominalizing’	-ukaay	‘instrumental’

-oo/-ɔɔ	‘reciprocal’	-lu	‘benefactive’
-oon/ -ɔɔn	‘past tense’	-aan	‘transitional’
-əm/-am	‘3 sg. possessive’	-aat	‘iterative’
-əl/-al	‘benefactive’	-aay	‘quality’
-ət/-at	‘intensive’	-aale	‘associative’
-əndoo / -andɔɔ	‘comitative’	-aange	‘result’
-ənte / antɛ	‘mutual’	-kat	‘agentive’
-ənde / -andɛ	‘moral quality’		
-ənti / -anti	‘corrective’		
-əli/ -ali	‘completion’		
-əndi /-andi	‘partial’		
-ədi / -adi	‘depriving’		
-əntu / antu	‘depreciative’		

When comparing Wolof and Ndut vowel harmony, three major differences can be found. First, in Ndut there are suffixes with alternating high vowels shown in (30). Second, the [-ATR] back mid vowel [ɔ] may have the central vowel [ə] as [+ATR] counterpart, which it shares with the low vowel [a]. Third, there are alternating suffixes with the long low vowel such as the iterative suffix *-aat*. Interestingly, this suffix is borrowed from Wolof and has developed a long [+ATR] counterpart *-əət* in Ndut. In Wolof, the same suffix does not alternate because it contains a long low vowel that lacks a [+ATR] counterpart in the vowel system.

(38) *Alternating iterative suffix -aat/-əət in Ndut:*

[+ATR]:	kun	‘close’	kunəət	‘close again’
[-ATR]:	pɔn	‘fold’	pɔnaat	‘fold again’

Archangeli and Pulleyblank (1994: 225) claim that in Wolof vowel harmony [-ATR] or [RTR], retracted tongue root, is the active feature element that triggers harmony and not the advanced tongue root [+ATR]. In Ndut vowel harmony, however, the active feature element appears to be [+ATR]. Diachronically, all the alternating suffixes can be derived from non-alternating suffixes with [-ATR] vowels. Thus, [+ATR] stem vowels trigger the vowel alternation in suffixes. In his comparative study of vowel harmony systems Casali (2003) claims that [ATR] dominance depends on the structure of the vowel inventory. Two underlying vowel inventory types with contrastive [ATR] dominance can be distinguished:

[+ATR] is dominant in languages with an [ATR] contrast among high vowels.

[-ATR] is dominant in languages with an [ATR] contrast among non-high vowels.

The Ndut vowel system corresponds exactly to the first type vowel inventory. [ATR] is contrastive for high vowels and [+ATR] is the dominant harmonic feature. The second type inventory is represented by the Wolof vowel system. Only non-high vowels exhibit an [ATR] contrast and the dominant feature of the harmony is claimed to be [-ATR]. According to this analysis the harmonies of both languages share only the spreading direction from left to right but involve different vowels. The borrowing process would thus have included the adaptation of the harmonic features to the vowel system of the borrowing language.

7. Conclusion

This paper attempts a diachronic analysis of two different phonological processes in Ndut: regressive and progressive harmony. Comparative evidence suggests that regressive harmony is an ancient phenomenon that can be traced back to the proto-language and probably even beyond. The occurrence of progressive harmony is restricted to Ndut and Palor and to the major contact language Wolof. The other Cangin languages as well as the other Senegambian languages Fula and Seereer that are spoken in the neighbourhood do not exhibit progressive harmony. The occurrence of other structural borrowings from Wolof support the claim that progressive harmony is a contact-induced innovation in Ndut. However, historical sources to document the intense language contact between Ndut/Palor and Wolof are lacking. Only a look at the geographical location of the Cangin speakers may give an idea of the sociolinguistic setting at the moment of borrowing. The settlements of both Ndut and Palor speakers are scattered along two main roads, where different ethnic groups are settling, many of whom are traders. In contrast, Noon and Laala villages are situated in more remote locations. These ethnic populations are almost homogeneous, and they subsist primarily on agriculture.

Vowel harmony as a contact-induced phenomenon is still not very well investigated, but probably is not as uncommon as assumed. A similar case of borrowing is attested in the Western Chadic language Tangale, which has apparently borrowed its vowel harmony from the Adamawa language Waja (Kleinewillinghöfer 1990). Dimmendaal (2001: 370) discusses the possibility of vowel harmony being an ancient convergence phenomenon in Niger-Congo and clearly

demonstrates that the occurrence of vowel harmony is restricted to several geographic areas that do not correspond to the genetic boundaries of the languages.

Thomason and Kaufman (1988: 53) discuss the borrowing of vowel harmony as a case of heavy structural borrowing that may result in a complete language shift or even language death. In Asia Minor Greek, strong Turkish influence resulted in the borrowing of Turkish vowel harmony and other linguistic features. This leads us to wonder whether contact-induced language shift is likely to occur in Ndut. Ndut is spoken in the villages around Mont Rolland. The local population still uses Ndut for their everyday conversations, and children are still learning the language. These facts imply that the language is far from dying in the countryside. In bigger towns, Ndut does not play any important role. The dominant language of urban society is Wolof since it is Senegal's most important means of interethnic communication. However, today many varieties of urban Wolof, widely spoken as a second language by speakers with different linguistic backgrounds, have lost their vowel harmony; the alternating definite article changes to non-alternating *a*. This is the only form of the distant definite article present in the Wolof-French dictionary of Fal, Santos and Doneux (1990). Thus, the harmonic concept must have been borrowed at an earlier time, when vowel harmony in Wolof was still active. This fact points to a period of stable bilingualism of Ndut and Wolof, since the moment of the heavy structural borrowing of vowel harmony persisting until today.

APPENDIX

The following comparative wordlists contain the vowels /a, aa, u, uu, i, ii/ in cognates of the Cangin languages. The high vowels of Saafi are marked with majuscule letters I and U because of the lack of [ATR] contrast between high vowels.

Set 1: Short vowel /a/

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
xas	xas	as	as	as	'new'
xanɲ	xanɲ	aɲ	aɲ	aɲ	'large'
ana	ana	kanak	ka-nak	-anak	'two'
ɲam	ɲam	ɲam	-ɲam	-ɲam	'eat'
xan	xan	an	-an	-an	'drink'
xap	xap	ap	-ap	-ap	'kill'

Set 2: Long vowel /a:/

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
naaʔ	naʔ	yanaw	yaanaw	yaanaaw	‘white’
waal	waal	waas	waas	waas	‘way’
ḅaaḅ	ḅaaḅ	ḅaaḅ	-baaw		‘travel’
yʼaal	yʼaal	yʼaar	yʼaal	yʼaal	‘man, husband’

Set 3: Short vowel /u/

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
pun	pun	pUn	-pun	-pun	‘fly’
ḅuk	ḅuk	nkUp	kuu	kuuḅ	‘mouth’
gumu	gumuʔ	ngUmU	gumu		‘hyena’
luk	luk	(kɔsɛ)	(kɔsɛʔ)	luk	‘tail’
sux	suʔ	sU/sUdɪ	suw-in	suḅ	‘dry’
fulil	fulil	fUdɪs	-furis	-furis	‘blow’
mun	mun	mUn	mun	muun	‘flour, powder’

Set 4: Long vowel /u:/

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
suul	suul	sUUUsUU	suusuus	suusuus	‘black’
kuum	kuum	kUUm	kuum	kuum	‘honey’
muume	mumaʔ	mUUmɛ	(gaynde)	(gaynde) ¹³	‘lion’
(tal-)ʔuul	(tal-)ʔuul		xuul	xuul	‘Palmyra palm’

Set 5: Short vowel /i/

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
(paŋ)	tik	tlk	-tik	-tik	‘prepare food’
lin		(gUr)	-lin	-lin	‘cultivate’
lim	lim	rIm	-lim	-lim	‘give birth’
kin	kin	kIn	-kin	-kin	‘count’
sis	sis	sIs	sis	sis	‘tooth’

¹³ This is a loanword from Wolof.

Set 6: Long vowel /i:/

<i>Ndut</i>	<i>Palor</i>	<i>Saafi</i>	<i>Laala</i>	<i>Noon</i>	
niil	niil	nIlr	niil		‘root’
til	tiil	tIln	-tiin	-tiin	‘walk’
6ii6	6iip	6IIp	6iiw	6ii6	‘breast’
jiin	jiin	kIln	(kumun)	(kumun)	‘nose’

REFERENCES

- Archangeli, Diana & Douglas Pulleyblank. 1994. *Grounded Phonology*. Cambridge Massachusetts: MIT Press.
- Arnott, David W. 1970. *The Nominal and Verbal System of Fula*. London, Oxford: Clarendon Press.
- Casali, Roderic F. 2003. “[ATR] value asymmetries and underlying vowel inventory structure in Niger-Congo and Nilo-Saharan”. *Linguistic Typology* 7: 307-382.
- Clement, George N. 2000. “Phonology”. *African Languages. An Introduction*, ed. by Bernd Heine. Cambridge: Cambridge University Press. Pp. 123 - 160.
- Crowley, Terry. 1994. *An Introduction to Historical Linguistics*. Auckland: Oxford University Press.
- D’Alton, Paula. 1987. *Le Palor. Esquisse phonologique et grammaticale d’une langue cangin du Sénégal*. Paris: Edition du CNRS.
- Diop Diagne, Maleine. 1989. *Aperçu comparatif et synchronique des systèmes phonologiques et nominaux des langues cangin*. Paris: Université de la Sorbonne nouvelle, Mémoire de Maîtrise

- Dimmendaal, Gerrit. 2001. "Language diffusion versus genetic inheritance: an African perspective". *Areal Diffusion and Genetic Inheritance* ed. by Alexandra Aikhenvald & R. M. W. Dixon. Oxford: Oxford University Press. Pp. 358-392.
- Dimmendaal, Gerrit. 2002. "Constraining disharmony in Nilotic: what does an optimal system look like?" *Journal of African Languages and Linguistics* 23: 153-181.
- Fal, Arame, Rosine Santos & Jean-Leonce Doneux. 1990. *Dictionnaire Wolof-Français*. Paris: Karthala.
- Hyman, Larry. 2002. "Is there a left-to-right bias in vowel harmony?". Paper presented at the 9th international phonology meeting in Vienna, Nov. 1 2002. To appear in the proceedings (*Phonologica*).
- Ka, Omar. 1994. *Wolof Phonology and Morphology*. Lanham: University Press of America.
- Kleinewillinghöfer, Ulrich. 1990. "Aspects of vowel harmony in Waja and Tangale-Waja common vocabulary". *Frankfurter Afrikanistische Blätter* 2: 93-106.
- Morgan, Daniel Ray. 1996. *Overview of Grammatical Structures of Ndut, a Cangin language of Senegal*. Arlington: University of Texas, M.A. Thesis.
- Sapir, J. David. 1971. "West Atlantic: an inventory of the languages, their noun class systems and consonant alternation". *Current Trends in Linguistics*. Vol. 7. Linguistics in Sub-Saharan Africa ed. by Thomas Sebeok. Paris and The Hague: Mouton. Pp. 45-112.
- Soukka, Maria. 2000. *A Descriptive Grammar of Noon*. München: Lincom Europa.
- Stewart, John M. 1983. "Akan vowel harmony: the word structure condition and the floating vowels. *Studies in African Linguistics* 14: 111-139.

Thomason, Sarah & Terrence Kaufman. 1988. *Language Contact, Creolization and Genetic Linguistics*. Berkeley, Los Angeles/Oxford: University of California Press.

Williams, Gordon. 1994. "Intelligibility and language boundaries among the Cangin peoples of Senegal". *Journal of West African Languages* 24.1: 47-67.

Institute of African Linguistics
Meister-Ekkehart-Str. 7
University of Cologne
Cologne, Germany
udrolc@gmx.de

[received December 20, 2003
accepted September 17, 2004]

ESQUISSE DE LA TONOLOGIE SYNCHRONIQUE DU WEMƏGBE, DIALECTE GBE DU SUD-BÉNIN*

Flavien Gbeto
Université d'Abomey-Calavi

In this paper I show that Weməgbe, a language spoken in southern Benin, has two underlying tones, H and L, and that the surface tones M, LH and HL are derived by phonological rules. A H tone is inserted after an initial prevocalic voiceless obstruent (occurring in non verbals), creating a HL contour tone, when the vowel of the syllable is L toned. The LH tone is derived through a right-spreading rule from a L' prefix tone, which is postulated for all verbs in their imperative forms and for all nouns. Of particular interest is the fact that the rightward spreading rule for L' is blocked by a voiceless obstruent. Finally, the M tone is derived through a L-Raising rule. This analysis shows that not only can vowels be TBUs in the world's languages, but also initial root consonants can be.

1. Introduction

Le weməgbe est parlé dans la province de l'Ouémé, sur tout le territoire des districts ruraux de bonu et d'ajowun, dans le district de: dangbo (sauf dans les com-

* Je voudrais remercier l'éditeur de SAL, David Odden, ainsi que le lecteur anonyme pour leurs remarques et suggestions. Je remercie aussi Sayane Gouroubéra pour sa lecture assidue du texte. Ces remarques m'ont imposé un travail supplémentaire de terrain; travail qui a sans doute permis, je l'espère, d'améliorer la qualité de l'article tant du point de vue du fond que de la forme. Ils ne doivent pas pourtant être tenus responsables des lacunes du texte final. Je remercie également mes informateurs Hounsou Eric, Dansou Honoré, Houmènou André, tous du village de Agonlin-Lowé ainsi que feu Azonhoumon Bertille, originaire du village d'Akpadanou pour la patience dont ils ont fait preuve en me livrant des données précieuses sur leur langue.

munes de dɛkɛn et de gbekɔ), dans les communes d'avagboji (district rural des agege), de zungbome (district rural d'akprɔ-miserete) et de jigbe (district rural de zɛ), et dans le village de katagɔn (district d'avlanku) (voir CNL 1983: 61). Le parler du chef lieu de la commune d'Adjohoun a été déjà l'objet d'un travail de mémoire de maîtrise (voir Houndékan 1983). Dans cet article, le parler que j'étudie est celui des villages d'Agonlin-Lowé et d'Akpadanou, commune d'Adjohoun, département du Plateau. Il sera glosé sous le terme wemɛgbe. Le wemɛ est partie intégrante de la soixantaine de dialectes gbe (voir Capo 2000) appartenant au Left Bank (Stewart 1989) du New Kwa selon la classification de Williamson (1989).

L'article sera organisé comme suit: dans la section 1, je présenterai le système consonantique de la langue, puisque les réalisations tonales dans cette langue dépendent de la nature de la consonne. Dans la section 2, je présenterai les structure syllabiques de la langue. Dans la section 3, je présenterai le point de la méthodologie. La section suivante sera consacrée aux tons dans le système nominal. Dans cette partie, on procèdera à une analyse distributionnelle des tons identifiés, analyse que je terminerai par le tableau récapitulatif de la distribution des tons dans le système nominal. La section 5 sera consacrée à la distribution des tons dans le système verbal. Quant à la section 6, elle sera consacrée à l'analyse. On y montrera surtout que le wemɛ a deux tons inhérents H et non-H symbolisés par H et B. Les tons M, HB et BH sont dérivés de ces deux tons de base. Ainsi, il sera montré que le ton M est une réalisation du ton B (6.2.2.1). Dans la sous-section 6.2.1, on montrera que le ton BH est dérivé par une règle de propagation préfixal B' présent dans la forme sous-jacente de tout radical (nominal et verbal). La propagation du ton préfixal B' a lieu en présence des consonnes voisées. Elle est bloquée par les obstruantes non voisées. Quant au ton HB relevé uniquement au niveau des nominaux, on montrera qu'il est dérivé par une règle d'insertion du ton consonantique H devant ton B après obstruante non voisée. La section 7 fera le point des idées discutées.

J'adopterai, dans ce travail, le système de transcription de l'API (Alphabet Phonétique International), sauf pour la notation des fricatives uvulaires notées [x] et [h], pour la notation de la nasale et de la semi-consonne palatale notée respectivement [ny] et [y]. Les tons seront notés comme suit: le ton B(as) par un accent grave (`), le ton H(aut) par un accent aigu (^), le ton M(oyen) par une barre horizontale (¯), le ton montant BH par le signe (ˇ) et le ton descendant HB par le signe (ˆ) sur la voyelle. Contrairement à la pratique de l'API, la nasalité sera transcrite, pour des raisons d'esthétique, par un tilde souscrit à la voyelle. Sauf précision, toute transcription doit être considérée comme phonétique

1. Le Système Consonantique du Wemɛgbe.

Comme la plupart des langues gbe, le wemɛgbe distingue douze voyelles phonologiques: /i, e, ɛ, a, ɔ, o, u, ɪ, ɛ̃, ɔ̃, ʊ/. Le système consonantique présente les unités suivantes résumées au tableau 1:

Tableau 1: Phonèmes consonantiques du wemɛ

[+obstr.]	f	t	s		c	k	x	kp	xw
	v	d	z		j	g	h	gb	hw
[-obstr.]	b(m)			d̥(n)	l̥(l)	y(y/ny)		w(w̥)	

Le tableau 1 présente une opposition [+obstruant]/[-obstruant].

Au niveau des obstruantes, il y a une opposition de voisement. Synchroniquement, tous les dialectes gbe opposent les obstruantes non voisées aux obstruantes voisées (Capo 1991). Au niveau des [-obstruant] qui sont toutes redondamment voisées, on note un phénomène de distribution complémentaire entre consonnes orales et consonnes nasales; les consonnes nasales [m, n, ɲ, y/ny, w̥] apparaissant avant voyelles nasales et leurs orales correspondantes [b, d̥, l, y, w] uniquement avant voyelles orales. Suivant la tradition inaugurée par Capo (1981, 1983, 1991), Bole-Richard (1983) et Gbeto (1997a), je considère les consonnes nasales [m, n, ɲ, ny, w̥] comme étant des variantes combinatoires prévisibles de /b, d̥, l, y, w/ devant voyelles nasales.

Lorsqu'on observe le comportement des consonnes [-obstruant] et des [+obstruant] par rapport aux faits de tonalité (voir Gbeto 2002b), on se rend compte qu'elles se répartissent en un certain nombre de classes naturelles de sons. Cette observation a été faite dans la littérature sur le gbe depuis Ansre (1961). On distingue notamment en gbe: les obstruantes voisées notées T et les obstruantes non voisées notées D. Les consonnes de la classe D ont pour effet de rabaisser le ton suivant alors que celles de la classe T ont pour effet de le relever. Le comportement des consonnes [-obstruant] est problématique en gbe (voir Gbeto 2002b, 2003). Ces consonnes se répartissent selon les trois classes naturelles suivantes (voir Gbeto 2002b): la classe des approximantes comprenant /l, y, w/ et notée L; la classe des sonantes nasales comprenant [m, n, ny, y, ɲ, w̥] et notée N, et la classe des consonnes implosives comprenant /b, d̥/ et notée B.

Si l'on en croit Stewart (1989, 1994), cette disparité est le résultat des changements phonétiques qui ont permis de dériver les proto-segments du gbe de ceux du proto-Volta-Congo, ancêtre des langues gbe. En proto-Volta-Congo, les

consonnes sonores douces, i.e. [ʼb, ʼd, ʼj, ʼgb, l] sont en distribution complémentaire avec les nasales correspondantes [m, n, ɲ, ŋm, ɲ]; les douces et les sonantes apparaissant respectivement devant voyelles orales et nasales. Stewart (1994: 185-187) propose alors une première règle qui remplace les dorsales douces voisées (i.e. les dorsales implosives et leurs partenaires nasales) par des semi-voyelles [y, w, ɣ, w]. A cette étape de la dérivation, toutes les consonnes concernées, à l'exception de [ʼb, ʼd], sont des sonantes. Une deuxième règle remplace les deux consonnes restantes par [b, d]. Deux conclusions peuvent être tirées de ce schéma. Le premier est que les consonnes implosives [ʼb, ʼd] du proto-Volta-Congo n'ont pas survécu en proto-gbe. Elles ont été remplacées par [b, d], i.e. des consonnes obstruantes voisées. Gbéto (2002b) a montré que ces consonnes peuvent avoir un effet sur la réalisation tonale suivante en abaissant, comme les obstruantes voisées, la réalisation tonale suivante. Le deuxième est que les consonnes implosives [ʼb, ʼd] n'ont pas disparu sans laisser de trace en proto-gbe. En effet, elles continuent de constituer, avec les sonantes, une classe naturelle de sons qui n'en est pas une. C'est donc cette évolution aberrante qui explique le comportement bizarre de ces sonantes et des consonnes [b, d].

Toute étude tonale sérieuse sur le gbe doit prendre en compte les évolutions constatées, puisqu'elles ont des répercussions sur les réalisations tonales synchroniques. En wemɛgbe par exemple, si l'on tient compte du phénomène tonal, deux classes naturelles de sons sont à prendre en considération: la classe des [+obstruant, -voix] et celle des [C, +voix] comportant aussi bien les obstruantes voisées que les sonantes, ainsi que les consonnes [b, d].

Gbéto (2002b) a montré que cette répartition tient compte de la propriété qu'ont ces consonnes de favoriser ou de ne pas favoriser l'application des règles phonologiques. Ainsi, devant les sonantes (orales ou nasales), le ton H peut s'abaisser; alors que le ton B peut se relever. Ce relèvement et cet abaissement peuvent dépendre aussi du caractère oral ou nasal de la sonante en question. Devant [b, d], le ton H peut s'abaisser; il arrive que ces consonnes n'aient aucune influence sur la réalisation tonale suivante, reflet de l'histoire de la langue.

2. Structures Syllabiques

2.1 Structure canonique. La structure syllabique minimale d'un mot (nominal et verbal) est le suivant (voir Gbéto 1997a, b) en gbe. Westermann (1927, 1930) a insisté sur la forte tendance des langues gbe au monosyllabisme.

- (1)
- | | | | |
|------|---|-------|--|
| | | T | |
| | | | |
| (v̇) | + | C(c)V | (T est mis ici pour un ton quelconque) |

La formule (1) comporte une voyelle initiale et une base radicale de forme C(c)V.

La voyelle initiale, qui peut être toutes les voyelles orales en gbe sauf [u],¹ sera considérée comme le préfixe vocalique. Ce préfixe vocalique porte toujours un ton non Haut, c'est-à-dire B en wemɛgbe. Westermann (1927, 1930, 1947) considère les voyelles initiales en gbe comme un vestige de classes nominales. Mukarovsky (1969) a tenté de rapprocher les préfixes vocaliques de l'ewe (entendez gbe) des préfixes nominaux des langues à classes comme le gurma, les langues bantu, le guang, le twi, le moore. Bien qu'il n'y ait pas accord de classes comme dans les langues à classes (comme les langues gur ou bantu), j'adopte la terminologie consacrée en gbe qui est de considérer les voyelles initiales comme étant des préfixes nominaux. Les préfixes nominaux distinguent formellement un nominal d'un verbal. Le verbe commence donc toujours, en surface, par une consonne. D'un point de vue phonologique pourtant, je considère, à la suite de Stahlke (1971a, b), Capo (1977) et Gbeto (1995, 1997a, 2002b) que le verbe est composé de deux éléments: un ton flottant B' (qui est le morphème de l'impératif) et un radical indiquant la forme neutre (infinitive) du verbe:

- (2) *Nominal*
- | | | | |
|-------------|--------|-------------|-----------|
| /àdú/ [àdũ] | 'dent' | /òtó/ [òtó] | 'oreille' |
|-------------|--------|-------------|-----------|
- (3) *Verbal*
- | | | | |
|------------|----------|----------------|---------|
| /`wá/ [wǎ] | 'viens!' | /`gbɔ́/ [gbɔ̃] | 'suce!' |
|------------|----------|----------------|---------|

Le radical C(c)V,² où *c* peut être n'importe laquelle des approximantes /l, y, w/. Les conditions de distribution de *c* par rapport à *C* (qui théoriquement peut être n'importe quelle consonne du système phonologique) n'étant pas pertinentes pour la discussion à suivre, je n'en ferai pas cas dans cette étude.

¹ En wemɛgbe, les préfixes vocaliques sont *o* et *a*.

² Dans la formule C(c)V, seule *C* est concernée par les règles tonales discutées dans cet article, la consonne *c* (*w, l, y*) ne favorise ni ne bloque l'application des règles tonales.

2.2 Autres structures syllabiques. Le wemegbe présente, en outre, les structures syllabiques suivantes en (4). En dehors de la structure CcV, aucun verbal n'a été identifié au niveau des autres structures syllabiques:

(4)	V:	é	'il'		
	CV:	kú	'meurs!'	mǎ	'nous'
	CVCV:	sónù	'pintade'	hwēví	'poisson'
	VCVCV:	àgbàzà	'corps'	àdògò	'ventre'

3. Point de méthodologie

Suivant la distinction classique faite entre synchronie et diachronie préconisée par de Saussure (1916/1995), on considère un processus phonologique comme synchronique lorsqu'il est (encore) productif à un moment donné de l'axe temporel; il est diachronique, lorsqu'il fait partie (déjà) de 'l'histoire' de cette langue. Une description sera dite synchronique quand elle prend en compte les données spécifiques d'une langue dans une localité et dans un temps déterminés; i.e. un état de langue. Une étude est dite diachronique, si elle s'occupe de l'évolution de la langue à travers le temps. F. de Saussure nous met en garde contre la confusion des deux niveaux d'analyse, mais il précise qu'une bonne description diachronique suppose une série d'analyses synchroniques conséquentes. Dans ce travail, je suis conscient de cette distinction fondamentale et je ne mélangerai pas les deux niveaux d'analyse. Les tableaux de comparaison que j'utilise n'ont donc pas pour but immédiat d'identifier le proto-système dont seraient issus les systèmes particuliers (dialectaux). Ces tableaux, qui présentent des données synchroniques de différents dialectes, visent à montrer les variations interdialectales du gbe. De ce point de vue, ils peuvent se révéler très utiles dans l'analyse des phénomènes d'un dialecte particulier, lorsque le chercheur se trouve confronté par exemple à différentes solutions alternatives qui se révèlent toutes adéquates d'un point de vue descriptif. Des exemples de ce genre sont nombreux dans l'analyse des langues gbe (voir Capo 1978, 1985a, b; Gbéto 1997a, b). Dans l'identification de la forme de base du pronom clitique de la troisième personne du singulier, il a été montré que toutes les trois variantes [i, e, ɛ] pouvaient être choisies comme formes de base en agbome, un autre dialecte gbe. La comparaison des données de l'agbome avec d'autres parlers gbe (notamment Aja et Ewe) a permis de montrer que la forme de base de ce pronom devait être /i/ dans tous les dialectes gbe.³

³ En proto-gbe, ce pronom a été aussi reconstruit /i/ (voir Capo 1991).

L'utilisation judicieuse de la comparaison dialectale permet d'identifier et de postuler des règles synchroniques. De pareils phénomènes ne sont pas du tout isolés en gbe (voir, entre autres, le phénomène d'arrondissement vocalique du gbe décrit par Capo 1986).⁴ Il n'est donc pas exclu qu'il en soit ainsi des phénomènes tonals. Cette méthode comparative à but synchronique a été non seulement utilisée dans la description des langues gbe, mais aussi dans celle des langues akan (voir Schachter & Fromkin 1968), et enfin celle des langues naturelles tout court (voir Hagège & Haudricourt 1978). Elle a été fortement recommandée par Clements (1991) qui écrit:

One of the main fruits of the pandialectal approach for phonological theory is the opportunity it provides to examine a population of closely languages and observe their patterns of variation across the same and subtly different phonological conditions. A rule that may seem uniform when only one language of the group is considered may turn out to be analyzable into a central, unmarked "core" and an extension or generalization to a new, more marked context when another language (or group of languages) is considered. The fact that some patterns of generalization are observed in preference to others suggests that rule evolution is governed by abstract structural principles that only a detailed analysis of closely related languages can bring to light. In this respect, the pandialectal approach, when based on rich materials [...], opens up the possibility of developing a typology of phonological processes that can serve as a basis for improving our models of rule markedness and historical change. [p. 16]

4. Les Tons dans le Système Verbal

Le wemɛgbe présente les tons suivants: B, H, M, HB et BH. Parmi ces tons, trois seulement sont relevés au niveau des verbaux, à savoir B, BH et H. Je présenterai ci-dessous la distribution respective de ces deux tons. Les verbaux sont donnés dans leur forme impérative⁵ qui est la forme de citation du verbe en gbe.

⁴ Toute grammaire, dont le but est de décrire la compétence du sujet parlant, doit prendre en compte aussi bien les variations intradialectales que les variations interdialectales.

⁵ L'ordre des termes dans les langues gbe (et aussi en wemɛgbe) est S P O. Le prédicat P comporte le verbal et les morphèmes TAM qui sont préposés au verbal, sauf pour l'expression du morphème habituel qui est postposé au verbal dans les langues ewe, gen, mais aussi en tɔfin (voir Gbeto 1997a). Le morphème du passé est de la forme Ø en wemɛgbe. Il y a une différence tonale entre la forme impérative exprimée à travers le ton préfixal flottant B' et la forme infinitive qui est privée de ce ton.

4.1 La distribution du ton B. Le ton B apparaît, au niveau des verbaux, sur la voyelle radicale des verbaux, quelle que soit la nature de la consonne:

- | | | | | | | |
|-----|----|----------|----|---------|-----|----------|
| (5) | dù | ‘mange!’ | nù | ‘bois!’ | gbò | ‘coupe!’ |
| | xò | ‘bats!’ | hù | ‘tue!’ | sà | ‘vends!’ |

4.2 La distribution du ton H. Le ton H apparaît, sur la voyelle des radicaux verbaux CcV, lorsque la consonne initiale est une [+obstruant, -voix]. Il n’est jamais relevé dans la forme impérative des radicaux verbaux dont la consonne est voisée. Les exemples en (6) et (7) sont illustratifs de cette distribution:

- | | | | | | | |
|-----|----|----------|-----|----------|-----|------------------|
| (6) | só | ‘pile!’ | kló | ‘lave!’ | fyé | ‘fais bouillir!’ |
| | kú | ‘meurs!’ | tǔ | ‘perce!’ | tú | ‘crache!’ |
-
- | | | |
|-----|------|-----|
| (7) | *gbé | *wá |
| | *nǔ | *dú |

Dans ce cas, il correspond aux tons H et BH d’autres dialectes gbe. Le tableau suivant est illustratif de ce fait:

Tableau 2: Correspondance H = BH = M au niveau des radicaux verbaux CV dont C est [+obstruant, -voix]

<i>Weme-gbe</i>	<i>Dogbo</i>	<i>Hwe-gbe</i>	<i>Agbome (fon)</i>	<i>Gun-gbe</i>	<i>Gloses</i>
só	tǔ	Tō	só	só	Pile!
kú	kǔ	Kū	kú	kú	Meurs!
tǔ	tǔ	tǔ	tǔ	tǔ	Perce!(oreille)
kpǔ	kpǔ	kpō	kpǔ	kpǔ	Regarde!

4.3 La distribution du ton BH. Il apparaît au niveau des radicaux verbaux de structure CV dont C est une [+voix]:

- | | | | | | | |
|-----|-----|------------|-----|--------------|----|-------------|
| (8) | mǎ | ‘partage!’ | lǔ | ‘saute!’ | wǎ | ‘viens!’ |
| | byǔ | ‘demande!’ | gbǎ | ‘construis!’ | hǔ | ‘surpasse!’ |
| | blǎ | ‘attache!’ | zě | ‘prends!’ | nǎ | ‘donne!’ |

Alors que le ton B des radicaux verbaux correspond toujours au ton B dans les autres dialectes gbe, le ton BH correspond aux tons H, BH et M des autres dialectes gbe, comme nous le montrent les tableaux suivants:

Tableau 3: Correspondance BH = M au niveau des radicaux verbaux CcV, dont C = [+obstr., +voix]

<i>Weme-</i>	<i>Xwla-</i>	<i>Kota-</i>	<i>Xwla</i>	<i>Xwela</i>	<i>Gloses</i>
<i>gbe</i>	<i>seme</i>	<i>fon</i>			
gbǎ	gbǎ	gbǎ	gbā	gbǎ	Construis!
jǐ	jǐ	jǐ	jī	jǐ	Gonfle!
vǐ	vǐ	vǐ	vī	vǐ	Pleure!
dǒ	dǒ	dǒ	dō	dǒ	Dors!

Tableau 4: Correspondance BH = M = H au niveau des radicaux verbaux CcV, dont C est [+sonant] ou [b, d]

<i>Weme-</i>	<i>Mɔvɔɔ</i>	<i>Dogbo</i>	<i>Xwla-</i>	<i>Agbome</i>	<i>Gloses</i>
<i>Gbe</i>			<i>seme</i>		
wǎ	wá	vā	wá	wǎ	Viens!
nǎ	nâ	nā	nâ	nǎ	Donne!
dǔ	dú	dū	dú	dǔ	Danse!
blǎ	blá	blā	blá	blǎ	Lie!
mǎ	má	mā	má	mǎ	Partage!

4.4 Tableau récapitulatif. La distribution des tons B, H et BH au niveau des radicaux verbaux est résumée dans le tableau qui suit:

Tableau 5: Distribution des tons au niveau des verbaux de type CcV

	H	B	M	BH
Radicaux verbaux commençant par T	+	+	-	-
Radicaux verbaux commençant par D	-	+	-	+
Radicaux verbaux commençant par L	-	+	-	+
Radicaux verbaux commençant par N	-	+	-	+
Radicaux verbaux commençant par B	-	+	-	+

5. Les Tons au Niveau du Système Nominal

5.1 La distribution des tons

5.1.1 Le ton H. Il apparaît sur la voyelle radicale nominale CcV des nominaux de structure (V)CcV. Dans ce cas, la consonne du radical ne peut être qu'une [+obstruant, -voix]:

- | | | | | | | |
|-----|-----|-----------|-----|----------|-----|----------|
| (9) | òtó | ‘oreille’ | òxú | ‘os’ | òfú | ‘plume’ |
| | òsí | ‘queue’ | kú | ‘graine’ | àfí | ‘cendre’ |

Dans ce cas, le ton H correspond aux tons H, M et BH d'autres dialectes gbe, comme le montre le tableau suivant:

Tableau 6: Correspondance H = BH = M au niveau des radicaux nominaux CcV dont C est [+obstruant, -voix]

<i>Weme- gbe</i>	<i>Dogbo</i>	<i>Hwe- gbe</i>	<i>Agbome (fon)</i>	<i>Gun- gbe</i>	<i>Gloses</i>
òtó	ètǒ	ētō	tó	òtó	oreille
àtí	àcǐ	ācī	àtí	àtí	arbre
òsó	ètǒ		só	òsó	montagne
àsú	àsǔ	āsū	àsú	àsú	mari

En dehors de la structure VC(c)V, le ton H est relevé sur la dernière syllabe -CV des radicaux nominaux de structure VC(c)VCV. Ici, la nature de la consonne de la syllabe n'est pas déterminante pour l'occurrence de ce ton:

- | | | | | | | |
|------|---------|----------|-------|---------|---------|------------|
| (10) | àlāká | ‘joue’ | àwǔtí | ‘nez’ | àjālākú | ‘éléphant’ |
| | hwèsíwó | ‘soleil’ | àgāsá | ‘crabe’ | | |

On relève le ton H sur la voyelle du pronom personnel sujet troisième personne du singulier de structure V. On relève enfin le ton H sur la voyelle radicale de quelques numéraux. Dans ce cas, la consonne du radical appartient à la classe des [+obstruant, -voix]:⁶

⁶ Je n'ai pas pu identifier de consonnes radicales sonores dans le contexte d'un ton H au niveau des numéraux. Je ne sais à quoi attribuer cette lacune au niveau des numéraux de structure CVCV, surtout au niveau de la seconde consonne.

- (11) é ‘il’ dōkpó ‘un’ àtǒǒ ‘cinq’

5.1.2 Le ton B. Le ton B apparaît sur la voyelle radicale C(c)V des nominaux de structure VC(c)V, lorsque C appartient à la classe des consonnes B, L, N et D. Aucune voyelle de radical nominal dont la consonne initiale est une [+obstruant, -voix] n’est intonée B:

- (12) àdò ‘intestins’ òhù ‘sang’ àgbò ‘buffle’
 àwà ‘aile’ àdǒ ‘racine’ àyì ‘cœur’
 àlǎ ‘chair’ ònù ‘bouche’ àlò ‘main’
- (13) *áfò *sì *òxwè

Au niveau des numéraux, le ton B apparaît aussi au niveau des radicaux CV, quelle que soit la nature voisée ou non de C:

- (14) àwè ‘deux’ àtò ‘trois’ ènè ‘quatre’

Le ton B apparaît enfin au niveau des pronoms personnels de type V et CV:

- (15) òn ‘je’ à ‘tu’ mǐ ‘vous’

5.1.3 Le ton BH. Le ton BH apparaît au niveau des radicaux nominaux de structure CcV, dont C est [+voix] et précédé ou non d’un ton B:

- (16) àdũ ‘dent’ òjǒ ‘graisse’ lǒ ‘crocodile’
 àvǐ ‘pleurs’ àhǒ ‘nombril’ dǔ ‘un’
 zǐ ‘singe’ zǎ ‘nuit’ ànǒ ‘sein’

Dans les cas examinés sous (16), le ton BH correspond soit au ton H, soit au ton M d’autres dialectes gbe:

Tableau 7: Correspondance BH = H = M au niveau des radicaux nominaux et verbaux CV dont C est [+voix]

<i>Weme- gbe</i>	<i>Dogbo</i>	<i>M̃wɔlɔ</i>	<i>Agbome (fon)</i>	<i>Gun- gbe</i>	<i>Gloses</i>
àḍḥ	āḍū	āḍú	àḍḥ	àḍḥ	dent
Zǎ	ēzā	òzǎ	zǎ	òzǎ	nuit
àhḗ	ēhḗ	àhḥkḗ	hḗ	àhḗ	nombril
ànḗ	ānḗ	ōnḗ	nḗ	ànḗ	sein
lǒ	ēlō	ōlō	lǒ	lǒ	crocodile

5.1.4 Le ton M. Le ton M apparaît: avant ton H, sur la première voyelle radicale nominale des items polysyllabiques de type CVCV. La séquence BH est exclue au sein du radical nominal polysyllabique:⁷

- (17) ḍòkpó ‘un’ kḥíḡó ‘genou’ àwḗḥí ‘nez’
ògbḗtó ‘personne’ àḍíḥí ‘droit’

- (18) *ḍòkpó *kḥíḡó *àwḗḥí
*ògbḗtó *àḍíḥí

5.1.5 Le ton HB. Le ton HB apparaît exclusivement au niveau des radicaux non verbaux dont C est une [+obstruant, -voix]. Je n’ai pas identifié de radicaux non verbaux CcV dont C est non voisée et qui soit porteuse de ton B:⁸

- (19) kô ‘vingt’ òkô ‘cou’ àfô ‘pied’
tâ ‘tête’ kpô ‘panthère’ xê ‘oiseau’
tô ‘fleuve’ òxwê ‘année’ xwlâkô ‘sel’

5.2 Tableau récapitulatif. Dans la mesure où en wemegbe, les régularités dans la distribution des tons ne s’observent qu’au niveau des morphèmes non verbaux,⁹

⁷ Ces exemples contrastent avec les suivants où on remarque la présence de la séquence BHH: àsíḡé ‘queue’, àḥíḥí ‘cendre’, àsyóví ‘hache’.

⁸ J’ai relevé un cas de numéral après lequel on note le ton B: àtḗ.

⁹ Au niveau des pronoms sujets au nombre de six, on relève seulement un exemple de structure CV portant le ton B: mḥ ‘vous’. Malgré cela, on observe une régularité par rapport à la distribution du ton H, lorsqu’on prend en compte les autres catégories grammaticales.

je ne vais donner, dans ce qui suit, que le tableau récapitulatif qui prend en compte cette catégorie de mots.

Tableau 8: Distribution des tons au niveau des radicaux nominaux CcV

	H	M	B	BH	HB
Radicaux nominaux commençant par T	+	? ¹⁰	-	-	+
Radicaux nominaux commençant par D	-	?	+	+	-
Radicaux nominaux commençant par L	-	?	+	+	-
Radicaux nominaux commençant par N	-	?	+	+	-
Radicaux nominaux commençant par B	-	?	+	+	-
Radicaux nominaux commençant par /t/	-	?	+	-	+

6. Analyse

6.1 Hypothèse de deux tons de base: H et B. Dans la mesure où le ton M n'est pas relevé au niveau des verbaux et où son occurrence est limitée au niveau des nominaux, il ne peut en aucun cas être choisi comme tonème. Seuls donc peuvent être phonèmes que les tons B, H, BH et HB.

L'examen du tableau récapitulatif 5 montre qu'au niveau des radicaux verbaux, il y a contraste entre ton H et ton non H, lorsque la consonne appartient à la classe T. Ce contraste disparaît devant les consonnes des classes D, L, N et B, i.e. avec les consonnes [+voix]. Dans ce cas, on observe un phénomène de distribution complémentaire entre ton H et ton B. Le même phénomène de distribution complémentaire s'observe avec les tons H et BH, le ton BH ne pouvant jamais apparaître avec les consonnes [-voix] et le ton H qu'avec les radicaux verbaux et nominaux dont la consonne est non voisée. Au niveau des radicaux nominaux, on observe aussi un phénomène de distribution complémentaire entre ton B et ton HB; le ton B ne se rencontrant jamais dans le contexte d'une consonne non voisée. Comme nous avons déjà établi le statut phonologique du ton B, je considère le ton HB comme un allotone du ton B.

Dans la mesure où on observe le contraste entre ton H et ton non H, i.e. B, on est en droit d'en conclure que le wemegbe comporte deux tons phonologique /H/ et /B/ et que BH est la réalisation du ton /H/ devant consonne voisée. Par ailleurs, certains pronoms de structure V, à savoir *é* 'il', où on ne peut soupçonner

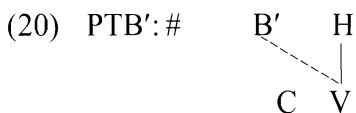
¹⁰Le ton M, on l'a vu (5.1.4), n'apparaît qu'au niveau des radicaux polysyllabiques, jamais au niveau des monosyllabiques. C'est ce qui justifie les interrogations dans la colonne du ton M.

l'action quelconque d'une consonne à moins que ce soit celle de la consonne qui suit (ce qui est invraisemblable, si l'on en croît Hombert (1978), portent un ton H. Si l'on choisit BH comme représentant le tonème /H/, on serait obligé d'écrire une règle *ad hoc* d'effacement du ton B. Ce qui ne serait pas le cas, si l'on choisit l'allotone H.

Mais que dire du ton M? Nous avons vu que ce ton n'apparaît qu'avant ton H et que la séquence tonale BH n'est pas permise au niveau des radicaux polysyllabiques. Je voudrais donc considérer le ton M comme une réalisation du ton B dans le contexte d'un ton H. On est donc en droit de dire que le wemegbe oppose un ton H à un ton non H, symbolisé respectivement par H et B. Les autres tons, à savoir HB, M et BH, seront considérés comme des allotones de ces deux tons de base et il s'agit de dégager les règles tonales de leur réalisation.

6.2 Réalisations des tonèmes H et B

6.2.1 Le ton BH en tant que réalisation du ton H et l'hypothèse d'un préfixe tonal B'. On a vu que le ton H des radicaux verbaux et nominaux est réalisé BH devant consonne voisée. J'avais alors émis l'hypothèse que ces radicaux portaient en structure sous-jacente un tonème H. Sur cette base, on peut poser une règle d'abaissement du ton radical H et la question est de savoir les motivations phonétiques de cette règle. Rappelons qu'au niveau des nominaux, le préfixe vocalique est toujours intonné B et que, au niveau des verbaux, nous nous trouvons en face d'une forme impérative. On est alors tenté de poser pour toute forme (verbale ou nominale) un ton préfixal B'. C'est cette position qu'ont adoptée Stahlke (1971a,b, 1976) pour le kpando et le yoruba, Capo (1977) pour le gengbe et le wacigbe. Ce point de vue a été défendu pour l'ensemble des parlers gbe par Gbeto (1995). Au niveau des verbaux, le ton préfixal B' représente le morphème de l'impératif (voir aussi Capo & Kossouho 2003, Gbeto 2003). C'est probablement l'absence de ce ton préfixal au niveau du pronom V qui explique la présence du ton H au niveau de /é/ [é] 'il'. On peut alors écrire la règle d'abaissement comme une règle qui propage le ton préfixal B' sur le ton H radical:



Le préfixe tonal ne peut se propager qu'à travers les [C, +voix]. Les raisons qui motivent la non-propagation du ton préfixal B' à travers les consonnes [+obstruant, -voix] seront discutées au 6.2.2.

(21) a.	/`wá/	→	[wǎ]	‘viens!’
b.	/àví/	→	[àvǐ]	‘pleurs’ (nominal)
c.	/`zé/	→	[zě]	‘prends’
d.	/àdú/	→	[àdǔ]	‘dent’
e.	/òtó/	→ *òtǒ →	[òtó]	‘oreille’
f.	/òfú/	→ *òfǔ →	[òfú]	‘plume’

6.2.2 Réalisations du ton B

6.2.2.1 Le ton HB et l’hypothèse d’insertion du ton H. Nous avons vu que le ton HB est conditionné phonétiquement. Il n’est relevé qu’avec des radicaux de type CcV dont C est une obstruante non voisée. C’est là un type particulier de relation entre tons et consonnes reconnue déjà par plusieurs chercheurs ayant travaillé sur les langues de l’Afrique de l’ouest (voir, entre autres, Ansre 1961; Stahlke 1971a,b; Hombert 1978; Capo 1977; Bole-Richard 1983; Hyman & Schuh 1974; Hyman & Mathangwane 1998, Gbeto 1995, 1997a, 1998/99, 2002a, b; Bradshaw 1999; Odden 2004). Les obstruantes voisées ont pour effet de rabaisser¹¹ la réalisation tonale suivante, alors que les obstruantes non voisées ont pour effet de la relever. Pour capturer cette relation, je voudrais faire l’hypothèse qu’une consonne rehaussante, symbolisée ici par R, crée un ton H dans sa structure squelettale, comme le montre la règle ITH (Insertion du ton H):

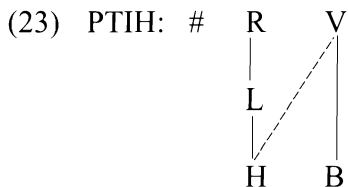
(22) ITH:	#	R	V
		L ¹²	
		⋮	
		H	T
			Condition: Radicaux non verbaux

Cette règle stipule que les consonnes rehaussantes (non voisées) insèrent un ton H devant toute voyelle portant un des tonèmes quelconques (i.e. B ou H) de la langue.

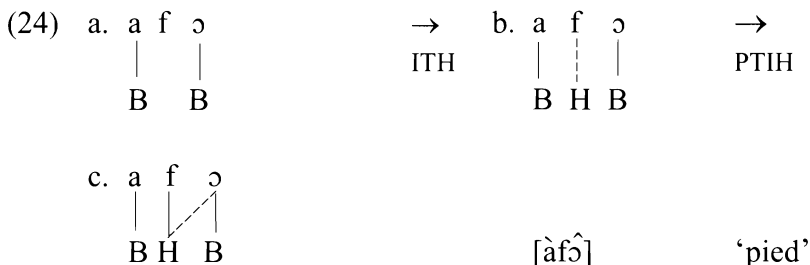
¹¹Dans la terminologie anglophone, ces consonnes sont appelées “depressor consonants”. Faute de mieux, je traduirai ce terme par “consonnes abaissantes” dans les lignes qui suivent. Pour les obstruantes non voisées qui rehaussent les tons, on les appellera “consonnes rehaussantes”.

¹²L désigne ici le nœud Laryngal.

Lorsque le ton vocalique est B, le ton H inséré se propagera à sa droite sur ce ton B selon la règle PTIH (Propagation du Ton Inséré H). Cela signifie que le ton vocalique dans les formes [c^hv] portent en réalité un ton /B/ dans leur forme de base. PTIH peut être formulé comme suit:



Ainsi, [àf^hɔ]¹³ peut être dérivé comme suit:



Cette analyse est supportée par la comparaison dialectale, puisque, dans les mêmes conditions énumérées ci-dessus, les autres dialectes gbe présenteront les ton B ou M (voir le tableau 9 ci-dessous).

Tableau 9: Correspondance HB = B = M au niveau des radicaux non verbaux CcV dont C est [+obstruant, -voix]

<i>Weme-</i> <i>gbe</i>	<i>Agbome</i> <i>(fon)</i>	<i>Dogbo</i>	<i>Mɔ̀vɔ̀lɔ̀</i>	<i>Gun-</i> <i>gbe</i>	<i>Gloses</i>
àf ^h ɔ	àf ^h ɔ	āf ^h ɔ	òf ^h ɔ		pied
kp ^h ɔ	kp ^h ɔ	ēkp ^h ɔ	òkp ^h ɔvē	òkp ^h ɔ	léopard
xw ^h ɔ	xw ^h ɔ	ēxw ^h ɔ	òxw ^h ɔ	òxw ^h ɔ	année

¹³ J'ai montré, ailleurs (voir Gbéto 1997a), que le préfixe vocalique nominal est extratonal au sens de Pulleyblank (1986) en gbe. De ce point de vue, la consonne radicale est supposée être en position initiale.

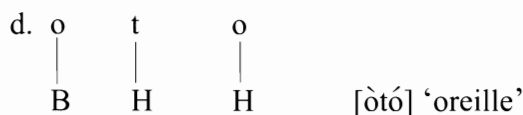
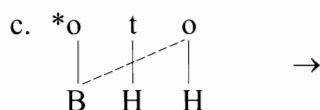
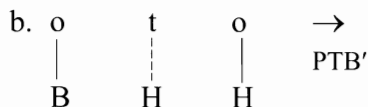
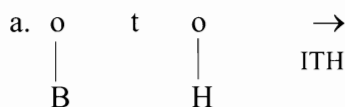
L'hypothèse selon laquelle les [+obstruant, -voix] insèrent un ton H est supportée non seulement par la comparaison dialectale où le ton HB des radicaux nominaux correspond au ton B d'autres dialectes gbe, mais aussi par les phénomènes de redoublement verbal et de composition nominale:

- (22) a. /xò/ 'battre' → xìxò → 'xìxò → xíxò → [xíxò] 'le fait de battre'
 /sà/ 'vendre' → sàsà → 'sàsà → sísà → [sísà] 'le fait de vendre'

- b. /xwlà + kó/ → 'xwlà kó → [xwlàkó] 'sel'¹⁴
 Pla sable

La règle ITH au niveau des radicaux CcV explique pourquoi, d'un point de vue formel, on n'observe pas de ton modulé BH, résultat de la propagation du ton préfixal B' sur le ton H suivant, après [C, -voix]. Cette propagation croiserait la ligne d'association qui relie C au ton H; ce qui est naturellement interdit par la convention de l'association (Goldsmith 1976/1979, 1990). Ainsi, /òtó/ 'oreille' ne se réalisera pas *[òtǒ] mais [òtó]:

- (26) Dérivation de /òtó/ 'oreille'



6.2.2.2 Le ton M, réalisation du ton B devant ton H. Il faut postuler une règle de relèvement du ton B avant ton H au niveau des radicaux non verbaux pour expliquer le ton M observé avant ton H au niveau d'item polysyllabiques:

- (27) RTB₂: B → M / ____ H

¹⁴ L'ethnie Pla maîtrise la technique d'extraction du sel dans l'ancien royaume du Danhomê. Le sel étant un mot tabou, on le désigne par l'euphémisme 'sable des Pla'.

a. /dɛ̀gbé/	→	nɛ̀gbé	→	[nɛ̀gbé]	‘dos’
b. /dɔ̀kú/	→	nɔ̀kú	→	[nɔ̀kú]	‘oeil’
c. /àwɔ̀tɔ̀/	→			[àwɔ̀tɔ̀]	‘nez’

6.3 Les tons dans le redoublement verbal. Le redoublement verbal est un processus morphologique très productif en gbe (voir Capo 1989). Il consiste à préfixer à la base verbale [C(c)V], une base sous-spécifiée [Ci], où [C] est la copie de la consonne initiale. La voyelle /i/ assimile les traits de nasalité, de labialité de la voyelle radicale. Ce qui nous préoccupe ici est le phénomène tonal induit par le redoublement. La question que je me pose est la suivante: le ton de la voyelle du réduplicatif est-il le ton de la voyelle radicale? En d’autres termes, y a-t-il une règle qui propage le ton radical sur la voyelle non spécifiée sur le plan tonal? Avant de répondre à cette question, voyons dans la réalité comment le processus a lieu en wemɛgbe. Je voudrais rappeler que le verbe comporte deux morphèmes: une partie radicale [C(c)V] (qui est la forme infinitive du verbe) et le ton préfixal B’qui est le ton de l’impératif.

Lorsque la voyelle radicale est intonée H et que la consonne de la syllabe est une [+obstruant, -voix], le réduplicatif portera un ton H:

(28) a. /fʏ́/	→	[fɪ́fɪ́]	‘le fait de faire bouillir’
b. /só́/	→	[sɪ́sɪ́]	‘le fait de piler’
c. /kú́/	→	[kɪ́kɪ́]	‘le fait de mourir’
d. /tɔ́/	→	[tɪ́tɪ́]	‘le fait de percer’

Lorsque la voyelle radicale est intonée H et que la consonne de la syllabe est une [(+obstruant), +voix], le réduplicatif portera un ton B pendant que le radical verbal portera un ton H:

(29) a. /ý/	→	[yɪ́yɔ́]	‘le fait de fondre’
b. /zé/	→	[zɪzé]	‘le fait de prendre’
c. /wá/	→	[wɪwá]	‘le fait de venir’
d. /gbá/	→	[gbɪgbá]	‘le fait de construire’

Lorsque la voyelle radicale est intonée B et que la consonne de la syllabe est une [(+obstruant), +voix], le réduplicatif portera un ton B pendant que le radical verbal lui aussi portera un ton B:

- (30) a. /ḑù/ → [ḑùḑù] ‘le fait de manger’
 b. /ḑ̃/ → [ḑ̃ḑ̃] ‘le fait de nager’
 c. /ḑ̃̃/ → [ḑ̃̃ḑ̃̃] ‘le fait d’accoucher’
 d. /zù/ → [zùzù] ‘le fait d’insulter’

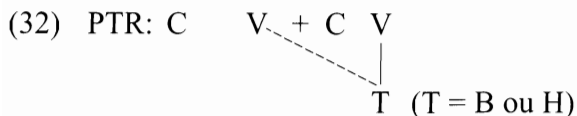
Lorsque la voyelle radicale est intonée B et que la consonne de la syllabe est une [+obstruant, -voix], la forme redoublée du radical verbal portera le schème tonal HM:

- (31) a. /sà/ → [sísā] ‘le fait de couler (fleuve)’
 b. /kù/ → [kúkù] ‘le fait de creuser’
 c. /xā/ → [xíxā] ‘le fait de compter’
 d. /sè/ → [sísē] ‘le fait d’entendre’

En examinant les formes en (28)-(31), on est tenté de poser les hypothèses suivantes: le ton du reduplicatif verbal porte le ton par défaut B, identique au ton préfixal; le ton du reduplicatif est une copie du ton radical.

La première hypothèse permet de rendre compte des redoublements verbaux en (28)-(29), puisqu’elle dériverait [zìzé] de /zé/ et [ḑùḑù] de /ḑù/. Mais elle dériverait faussement *[kùkù] de /kù/ et *[sìsà] de /sà/. Pour dériver la forme correcte, on pourra imaginer le scénario suivant. Puisque le verbe redoublé ne fait pas partie de la classe des verbaux, ITH puis PTIH s’appliquent. La simplification du contour tonal HB permettrait alors de dériver [kúkù] de /kùkù/, mais également [sísà] de /sìsà/. Il reste cependant à se demander comment justifier le relèvement du ton B du radical verbal. On pourra ensuite faire propager le ton H de [sí-] sur le ton suivant et dériver la séquence HM de H-HB.

La question se pose de savoir s’il n’y a pas une grammaire plus simple pour rendre compte des faits observés. On fera remarquer qu’en wemɛgbe, mais aussi en gbe, le reduplicatif copie les traits de nasalité (par exemple *tḑ* ‘percer’ sera redoublé en [tḑtḑ] en passant par *tḑtḑ*) et de labialité (lorsque la voyelle est haute, par exemple *kú* ‘mourir’ sera redoublé en [kúkù] en passant par *kíkú*) de la voyelle radicale. Pourquoi le même phénomène ne s’observerait-il pas lorsqu’il s’agit des faits tonals? Je voudrais donc opter pour la seconde hypothèse et dire que le wemɛgbe a une règle qui propage le ton radical sur la voyelle. Cette règle, je la formule comme PTR (Propagation du Ton Radical):



Ainsi, les radicaux verbaux de type /cṽ/, avec C = [+voix], auront pour forme redoublée [cṽcṽ] (par exemple *qù* ‘mange!’ sera redoublé en *qùqù*). Lorsque les radicaux sont de type [cṽ], le redoublement est de la forme [cṽcṽ] (par exemple *kú* ‘mourir’ sera redoublé en *kúkú*). Les radicaux verbaux de type [cṽ] redoublent en [cṽcṽ] (par exemple *gbǎ* ‘construis!’ sera redoublé en *gbígbá*). Dans cette forme, on voit que le radical est intoné H et ce ton H représente le ton de base, celui de la forme infinitive du verbe. Le redoublement /cṽ/ de cette forme donnant toujours cṽcṽ, il s’agit d’expliquer pourquoi, en lieu et place, nous avons [cṽcṽ]. Comme la forme redoublée est un élément non verbal, je fais l’hypothèse qu’elle est affectée d’un ton préfixal B’. On pourra alors expliquer l’abaissement du ton H du reduplicatif par une règle de propagation du ton préfixal B’. Cette règle est une forme remaniée de PTB’:



Si l’hypothèse du préfixe tonal est vraie, comment expliquer que la forme redoublée de /kú/ ‘mourir’ ne donne pas *[kùkù] mais plutôt [kúkú]; en d’autres termes pourquoi PTB’₁ ne s’applique pas ici. Si on sait que les consonnes voisées insèrent un ton H, on pourra expliquer la forme [kúkú] par l’impossibilité du ton préfixal B’ de se propager à sa droite pour dériver la forme incorrecte *[kùkù], cette propagation devant entraîner le croisement des lignes d’association interdit par la convention de l’association.

Il reste à expliquer comment dériver cṽcṽ de cṽ, i.e. [sísā] de /sà/ ‘achète!’? Dans la mesure où la forme redoublée est un item verbal et que l’insertion du ton H s’observe en position initiale de radical, je fais l’hypothèse que /sà/ passera par une étape intermédiaire qui se manifestera par l’application de ITH et PTIH qui dérivera [sâ]. Par PTR, le premier versant du ton HB se propage sur la voyelle du reduplicatif;¹⁵ ce qui permet de dériver [sísâ]. Ensuite, la séquence H-HB (sísâ) se réalisera H-M [sísā].

¹⁵ Je remercie David Odden pour m’avoir suggéré cette hypothèse que je trouve attrayante et dont j’endosse l’entière responsabilité.

6.4 Le traitement d'exception. ITH et PTIH, on l'a vu, s'appliquent aux radicaux non verbaux pour dériver le ton HB du ton /B/. Il existe pourtant un cas de morphème non verbal, le numéral *âtɔ̃* 'trois', dont la consonne, qui est une consonne rehaussante, ne module pas le ton B. L'existence d'exception au niveau de radicaux non verbaux est un indice que ITH et PTIH sont des règles de nature phonologique. Si cette règle était une règle phonétique, on ne s'attendrait pas à avoir d'exception, toutes les consonnes rehaussantes devant favoriser ITH et PTIH; puisque je ne m'explique pas pourquoi /kò/ [kô] 'vingt' modulera le ton B en HB et pas /âtɔ̃/ [âtɔ̃]. La non-application de ITH et PTIH au niveau de [âtɔ̃] trouve-t-elle son explication dans le fait que /t/, qui est la consonne coronale par défaut ne soit pas transparente à l'application de ces règles au niveau des numéraux? L'unicité¹⁶ de l'exemple ne permet pas de répondre avec satisfaction à cette question.

7. Conclusion

Cette étude nous a permis de voir que, comme dans les autres langues gbe, le wemegbe oppose deux tons sous-jacents symbolisés par B et H. Les autres tons sont des tons dérivés de ces deux tons de base. Ainsi, le ton M est une réalisation du ton /B/ en contact avec le ton H. La modulation tonale BH s'explique par une règle de propagation du ton (préfixal) B'. Quant à la modulation tonale HB, qui apparaît au niveau des nominaux, elle s'explique par une règle d'insertion avant ton B du ton H, interprétation phonétique du non-voisement de la consonne. L'insertion du ton consonantique H explique pourquoi les consonnes sourdes bloquent la propagation du ton préfixal B' à travers elles. A l'issue de la description

¹⁶ Je n'ai identifié que deux numéraux comportant la consonne coronale par défaut /t/. Il s'agit de /âtɔ̃/ 'cinq' et /âtɔ̃/ 'trois'. Ces deux numéraux ont la même correspondance tant au niveau segmental qu'au niveau prosodique dans les autres variétés dialectales gbe.

Le lecteur anonyme estime qu'on pourrait rendre compte de cet exemple en le considérant comme une exception occasionnelle. L'argument de la transparence des consonnes coronales évoqué ici ne serait donc pas justifié, puisque la transparence des consonnes coronales est du ressort de l'harmonie vocalique faisant intervenir la localisation. Même si cela est vrai, on relève, en gbe, plus particulièrement en tɔ̃fingbe de Ganvie (voir Gbéto 2004), des cas de transparence (ou de non de transparence) de la coronale /t/ aux règles tonales. En tɔ̃fingbe de Ganvié par exemple, la coronale /t/ est transparente à la règle d'abaissement du ton radical H applicable uniquement au niveau des radicaux CcV, dont C est [+voix]. L'hypothèse de la non-transparence au niveau de numéraux semble, à mon avis, donc justifiée.

de la tonologie synchronique du wemegbe, nous voudrions suggérer que les unités porteuses de tons dans les langues naturelles sont non seulement les voyelles, mais aussi les consonnes radicales (Newmann 1996, Odden 1996).

RÉFÉRENCES

- Ansre, Gilbert. 1961. *The Tonal Structure of Ewe*. Hartford Studies in Linguistics 1. Hartford, Conn.: Hartford Seminary Foundation.
- Bole-Richard, Rémy. 1983. *Systématique phonologique et grammaticale d'un parler Ewe: le Gen-Mina du Sud-Togo et Sud-Bénin*. Paris: L'Harmattan.
- Bradshaw, Mary. 1999. *A Crosslinguistic Study of Consonant-Tone Interaction*. Columbus: Ohio State University, Ph. D. dissertation.
- Capo, Hounkpati B. C. 1977. *Etude phonologique comparée du wacigbe et du gengbe*. Cotonou: Université Nationale du Bénin, Mémoire de maîtrise.
- Capo, Hounkpati B. C. 1978. "A propos des corrélations de palatalisation et de labialisation en fon". *Annales de l'Université d'Abidjan* (série H, Linguistique) 11: 5-19.
- Capo, Hounkpati B. C. 1981. *A Diachronic Phonology of the 'Gbe' Dialect Cluster*. Legon: University of Ghana, Ph. D. Dissertation.
- Capo, Hounkpati B. C. 1983. "'I' et 'U' en Hwe et leur place dans la reconstruction du proto-gbe". *Journal of West African Languages* XIII, 1: 19-30.
- Capo, Hounkpati B. C. 1985a. "Determining the third personal singular object pronoun in Gbe". *West African Languages in Education*, ed. by Kay Williamson. Wien: Afro-Pub. Pp. 106-131.
- Capo, Hounkpati B. C. 1985b. "'Palatalisation' synchronique en Gbe". *Afrika und Übersee* 68: 187-206.

- Capo, Hounkpati B. C. 1986. "Vowel roundness in Gbe: a pandialectal approach". *Journal of West African Languages* 16: 15-36.
- Capo, Hounkpati B. C. 1989. "L'assimilation d'arrondissement dans le redoublement des formes verbales en Gbe". *Linguistique Africaine* 3: 19-42.
- Capo, Hounkpati B. C. 1991. *A Comparative Phonology of Gbe*. Berlin & Garome: Foris & Labo-Gbe (Int.).
- Capo, Hounkpati B. C. 2000. *The New Ewe Orthography*. Cape Town & Garome: Casas & Labo-Gbe (Int.).
- Capo, Hounkpati B. C. & F. Félicité Kossouho. 2003. "De quelques spécificités phonologiques de l'Ajlagbe: un parler gbe". *Linguistique Africaine* 23: 19-51.
- Clements, G. N. 1991. "Foreword" to Capo 1991. Pp. xv-xvi.
- C. N. L. (Commission Nationale de Linguistique). 1983. *Atlas Sociolinguistique du Bénin*. Institut de Linguistique Appliquée / Agence de Coopération Culturelle et Technique: Abidjan/Paris.
- Gbéto, Flavien. 1995. "Quelques aspects comparatifs et diachroniques de la tonologie du gbe". *Afrika und Übersee* 78: 73-99.
- Gbéto, Flavien. 1997a. *Le maxi du Centre-Bénin et du Centre-Togo*. Köln: Rüdiger Köppe Verlag.
- Gbéto, Flavien. 1997b. "Assimilation du pronom substitutif en Gbe et phénomènes apparentés revisités". *Afrikanistische Arbeitspapiere* 49: 105-132. Köln: Institut für Afrikanistik, University of Köln.
- Gbéto, Flavien. 1998/99. "Description et Hypothèses sur la nature de l'UPT (Unité Porteuse de Ton): l'exemple des langues gbe". *Journal of West African Languages* 27.2: 3-20.

- Gbété, Flavien. 2000. *Les emprunts linguistiques d'origine européenne en Fon (Nouveau Kwa, Gbe: Bénin): une étude de leur intégration au plan phonético-phonologique*. Köln: Rüdiger Köppe Verlag.
- Gbété, Flavien. 2002a. "Une esquisse de la tonologie du mɔ̀vɔ̀ɔ̀, dialecte gbe du Sud-Bénin". *Cahiers d'Etudes Linguistiques* 6: 47-59.
- Gbété, Flavien. 2002b. "Les consonnes voisées 'implosives' et leurs rôles dans la tonogenèse et la nasalité des consonnes dans quelques langues Volta-Congo". *Gbe Studies/Etudes Gbe* 1:7-31.
- Gbété, Flavien. 2003. "Le système tonal du dogbo, variété dialectale Aja du Sud-Bénin (New Kwa, Gbe) entre le passé et le présent". *Linguistique Africaine* 23: 75-108.
- Goldsmith, John A. 1976/1979. *Autosegmental Phonology*. Cambridge, Mass.: MIT, PhD. dissertation. Distributed by Indiana University Linguistics Club: Bloomington.
- Goldsmith, John A. 1990. *Autosegmental and metrical phonology*. Cambridge: Blackwell.
- Goldsmith, John A. (ed.). 1996. *The Handbook of Phonological Theory*. Cambridge: Blackwell.
- Hagège, Claude & André Haudricourt. 1978. *La phonologie panchronique*. Paris: PUF.
- Hombert, Jean-Marie. 1978. "Consonant types, vowel quality and tone". *Tone: a Linguistic Survey*, ed. by Victoria Fromkin. New York: Academic Press. Pp. 77-111.
- Houndékan, Cosme Z. 1983. *Contribution à l'étude phonologique du wemegbe: le parler d'Ajowun*, Mémoire de maîtrise, Université Nationale du Bénin, Abomey-Calavi.
- Hyman, Larry & Joyce T. Mathangwane. 1998. "Tonal Domains and Depressor Consonants in Ikalanga". *Theoretical Aspects of Bantu Tones*, ed. by Larry

- Hyman & Charles Kisseberth. Stanford: CSLI, Stanford University. Pp. 195-229
- Hyman, Larry & Russell Schuh. 1974. "Universals of tone rules: evidence from West Africa". *Linguistic Inquiry* 5: 81-115.
- Mukarovsky, G. Hans. 1969. "Zur Struktur des Ewe". *Wort und Religion*, ed. by Hans-Jürgen Greschat & Hermann Jungraithmayr. Stuttgart: Evangelischer Missionsverlag GmbH. Pp. 107-126.
- Newmann, Paul. 1996. "Hausa tonology: complexities in an 'easy' tone language". in Goldsmith 1996. Pp. 762-781.
- Odden, David. 1996. "Tone: African Languages". in Goldsmith 1996. Pp. 444-475.
- Odden, David. 2004. "The Verbal Tone System of Zina Kotoko". *Some Aspects of the Grammar of Zina Kotoko*, ed. by Bodil Kappel Schmidt, David Odden & Anders Holmberg. Lincom Studies in African Linguistics 54. München: Lincom Europa. Pp. 15-34.
- de Saussure, Ferdinand. 1916/1995. *Cours de Linguistique Générale*. Paris: Payot.
- Schachter, Paul & Victoria A. Fromkin. 1968. "A Phonology of Akan: Akuapem, Asante, Fante". *Working Papers in Phonetics* 9, UCLA.
- Stahlke, Herbert. 1971a. *Topics in Ewe phonology*. Los Angeles: UCLA, Ph. D. Dissertation.
- Stahlke, Herbert. 1971b. "The noun prefix in Ewe". *Studies in African Linguistics*, Supplement 2: 141-159.
- Stahlke, Herbert. 1976. "The noun prefix in Yoruba". *Studies in African Linguistics*, Supplement 6: 243-253.

- Stewart, John M.. 1989. "Kwa". *The Niger-Congo Languages*, ed. by John Bendor-Samuel. New York: University Press of America. Pp. 217-245
- Stewart, John M. 1994. "Review Article: The Comparative Phonology of Gbe and its Significance for that of Kwa and Volta-Congo". *Journal of African Languages and Linguistics* 15: 175-193.
- Westermann, Diedrich. 1927. *Die westlichen Sudansprachen und ihre Beziehungen zum Bantu*. Berlin: Walter de Gruyter.
- Westermann, Diedrich. 1930. *A Study of the Ewe language* (translated by B. Smith). London: Oxford University Press.
- Westermann, Diedrich. 1947. *Der Wortbau des Ewe*. Abh. der Preussischen Akad. der Wiss. Phil.-Klasse, Nr 9. Berlin: Verlag der Akademie der Wissenschaften.
- Williamson, Kay. 1989. "Niger-Congo overview". *The Niger-Congo Languages*, ed. by John Bendor-Samuel. New York: University Press of America. Pp. 3-45.

Dynamique des Langues et Cultures a Calavi
(Labodylcal)
Campus Universitaire à Abomey-Calavi
01 B.P. 526 Cotonou
République du BENIN
fgbeto@bj.refer.org

[Received October 12, 2003
accepted August 8, 2004]

CLAUSAL AND DP-INTERNAL AGREEMENT IN IKALANGA

Rose Letsholo
Oakland University

This paper investigates the controversial morphemes that occur both at the clause level and within the DP in Bantu languages such as Ikalanga, which have been analyzed as “agreement morphology” by some (Baker 2002, Demuth and Harford (1999) and as resumptive/incorporated pronouns by others (Bresnan and Mchombo 1987, Zwart 1997). The paper proposes a unified analysis of this phenomenon, analyzing both clausal and DP-internal occurrences of these morphemes as agreement morphology which holds between the head of an XP and its predicate, or between the head of an XP and its modifiers. In both instances, the agreement relation is instantiated after movement of the relevant category from its base position to a specifier position which enables the moved category to enter into a checking relation (i.e. a spec-head configuration) with another category that has matching features (Chomsky 1995).

1. Background

Most of the data used to advance the arguments presented in this paper come from Ikalanga, a virtually unstudied Bantu language spoken in the northeastern and central parts of Botswana, and also in parts of Zimbabwe. The dialect analyzed in this paper is one spoken in central Botswana. Since there has been no recent population census, it is difficult to provide an accurate estimate of the Ikalanga speakers population. Mathangwane (1999) estimates the Ikalanga population to be about 150,000, a figure which no doubt has risen by now. Guthrie (1967-71) classifies Ikalanga as an S.16 language, placing it in the same zone as other southern Bantu languages, specifically the Shona group. However, as observed in Mathangwane (1999), Ikalanga differs from the Shona dialects in the areas of grammar, vocabulary and sound system. Of relevance to this paper is the

difference in the concord system, specifically in class 18. In Shona, the agreement morpheme for class 18 is *m-*, copying the noun class prefix which is *mu-*, while in Ikalanga the locative classes, namely classes 16, 17 & 18, all take a default agreement morpheme *k-*.

1.1 The issue. Bantu languages such as Ikalanga, Chichewa (Bresnan and Mchombo 1987, henceforth B&M 1987), Kinande (Baker 2002), KiLega (Kinyalolo 1991), and Sesotho (Demuth and Harford 1999) have obligatory morphemes (often referred to in the literature as subject markers) which agree in *phi* features with the subject NP in finite sentences. A quick look at current research in Bantu languages reveals that there is controversy regarding the status of subject markers.¹ Some researchers treat subject markers found in Bantu languages as agreement markers (Baker 2002, Woolford 1999, Demuth and Harford 1999, Carstens 1997). Others treat the same morphemes as having dual functions, sometimes functioning as agreement markers and other times as incorporated pronouns (B&M 1987, Keach 1995, Omar 1990). Givón (1976) suggests that agreement and pronominalization are fundamentally one and the same phenomenon. Yet another view is one which treats these morphemes as clitics. For example, Eze (1995) argues that Igbo, a West African language spoken in Nigeria, is a null subject language whose null subject is licensed by the preverbal subject clitic, since it contains the *phi* features of person and number. A similar view to the clitic analysis is offered by Zwart (1997) who proposes that subject markers in Swahili are resumptive pronouns comparable to the “d-word” *die/dat* in Dutch.

This paper argues that “subject markers” are not pronouns (resumptive or otherwise) but that they are agreement morphology which holds between a subject and its predicate. This paper further argues that agreement which occurs outside of the verbal domain (i.e DP-internal agreement) is not an instance of resumptive pronouns, but is just another case of agreement between the head noun and its modifiers, a phenomenon quite common in the world’s languages, including Germanic languages. Thus, this paper proposes a unified analysis of agreement (the clausal type and the DP-internal type), namely that agreement is a relation that holds between the head of an XP and its predicate or modifiers. I argue that the fact that the DP-internal agreement is sometimes phonologically homophonous with subject markers is not surprising because the head noun of any

¹ Most of the recent analyses of subject markers in Bantu cited in the literature build on Bresnan and Mchombo’s (1987) analysis of subject markers.

DP controls agreement both within the DP and in the clause in which it functions as the grammatical subject.

I will argue that the markers indicating agreement between the head noun of the subject of a sentence and its predicate and the agreement marker between a noun and its modifiers that Zwart discusses might be morphologically homophonous but have different syntactic statuses: the former expresses agreement between the subject of a clause and its predicate, while the latter expresses a relation between a noun and its modifiers even though both express agreement involving *phi* features of the same head noun. That the agreement morphemes expressing a relation between the noun and its modifiers are not phonologically uniform causing them sometimes to be homophonous with the agreement morpheme expressing the relation between the subject of a sentence and its predicate is a purely (morpho)phonological matter and is not of significant import, syntactically. Explaining the homophony between noun modifier agreement and subject predicate agreement is beyond the scope of this paper. Nonetheless, both the DP-internal agreement and the clausal agreement can be understood if we adopt an analysis in which agreement is a relation realized only in a specific configuration, i.e. the spec-head configuration (Chomsky 1995, Koopman and Sportiche 1991, Baker 2002, Demuth and Harford 1999, Kinyalolo 1991, Carstens 1997). This configuration holds only after movement has taken place to check uninterpretable features (Chomsky 1995, see section 1.2 below for an overview of the theoretical assumptions adopted in this paper).

The paper specifically argues against two analyses in the literature regarding the status of subject markers. The first analysis is B&M (1987) who argue that subject markers (SMs)² are sometimes incorporated pronouns and other times agreement morphemes. The second analysis is Zwart (1997) who proposes that Bantu languages such as Swahili do not express subject-verb agreement at all, and that subject markers are resumptive pronouns. Based on facts from Ikalanga and other languages, I argue that, first of all, subject-verb agreement *is* expressed in Bantu languages such as Ikalanga and Swahili. Second, I propose that subject markers always indicate agreement morphology which holds between a head of an XP which is in a subject position and its predicate. Evidence for my proposal is based on an investigation of the behavior and distribution of SMs, and the in-

² Abbreviations used in this paper are as follows. SM = subject marker, IND = indicative, FV = Final Vowel, Noun_{number} = noun class number, Pres. = Present Tense, OM = Object Marker, Rel. = Relative, AGR = Agreement, EPP = Extended Projection Principle, HAB = Habitual, Cop. = copula, PL = Plural, Expl. = Expletive, Loc. = Locative, DIST. = Distal, asp. = aspect.

teraction of SMs with other syntactic properties such as mood and negation. Before any further discussion, I provide some background information on the theoretical assumptions adopted in the analysis in this paper.

1.2 Theoretical assumptions. The analysis adopted in this paper is couched in the theory of Minimalism as discussed in Chomsky (1995, 2001). In this theory, it is assumed that words have three kinds of syntactic properties: specifiers, heads and complements, each of which has features which are either interpretable or uninterpretable. Specifier features indicate the kind of specifier a given word, e.g. the verb *dislikes* in example (1), should have, for instance the specifier should have nominative, third person, feminine, singular features. The features person, number, tense and gender are usually collectively referred to as *phi* features. The head features of the verb *dislikes* are simply its intrinsic grammatical features, for example, present tense, third person, feminine/masculine, singular. The complement features of *dislikes* indicate the kinds of complement that this verb requires, i.e. some kind of nominal or proposition.

(1) Mary dislikes apples.

Interpretable features are those that have semantic content, i.e. person, number, gender and tense, while uninterpretable features are those without semantic content, i.e. case. To illustrate, the pronouns *I* and *me* have the same interpretation in examples (2) and (3), that is they are both subjects of *will pass/to pass* respectively although they have different case properties since *I* is nominative and *me* is objective.

(2) John expects that I will pass.

(3) John expects me to pass.

Case, E(xtended) P(rojection) P(rinciple) and agreement features are regarded as part of the tense feature. The EPP is the requirement that every clause should have a subject. In current Minimalism, EPP is regarded as a feature of three categories: vP, C(omplementizer), and T(ense) P(hrase). Verb endings that do not indicate tense, for example the *-n* indicating perfective/past participle in verbs such as *written* are also considered to be uninterpretable. Thus, for a derivation to converge (that is, to pass as grammatical), uninterpretable features should be checked (erased/deleted) at L(ogical) F(orm). For checking to take place, the features of

the lexical item doing the checking and those of the item checked have to match. For example, in (3) above, the features of the head *expects* (disregarding the feature present tense), 3rd person singular, match those of the specifier *John*, which also has 3rd person singular features. If the specifier in (3) were a plural pronoun like *they*, then this derivation would not converge because of feature mismatch since *they* has one mismatching feature with *expects*, ‘plural’.

This theory makes use of the split VP hypothesis, which is the hypothesis that VP has two shells, an inner shell headed by V (the lexical verb) and an outer shell headed by a light verb, represented as *v*. Subjects of unergative verbs (i.e. agentive subjects) are said to be base generated as specifiers of *v*P, while subjects of unaccusatives are said to be base generated in the specifier of VP. My analysis adopts Chomsky’s (1995) idea that specifiers are iterable. Thus modifiers are analyzed as adjoined to specifier positions. In addition, I adopt the strong lexicalist view of Chomsky (1995 and subsequent works) in which lexical items (that is, words) are introduced in the grammar fully inflected.

The rest of the paper is organized as follows. Section 2 discusses and critiques previous analyses of SMs, specifically B&M (1987) and Zwart (1997). Section 3 analyzes SMs within the verbal domain in light of the proposal advanced in this paper, that SMs are simply agreement morphology between the head of an XP and the predicate of that XP. Section 4 presents evidence based on the interaction of subject markers with other syntactic phenomena to further argue that SMs are agreement morphology and not pronouns of any sort. Section 5 addresses Zwart’s concern regarding agreement outside of the realm of the verb, and shows how such agreement facts can be explained in terms of the spec-head relation analysis adopted in this paper. Section 6 concludes the discussion.

Since the noun class system plays a crucial role in the discussion in this paper, I provide the noun class system of Ikalanga for ease of reference.

Table 1: Ikalanga Noun Class Prefixes and Agreement Markers.³

cl.	Noun prefix	Subject Agreement				OM	example	gloss
		Pr.	Ps.	Ft	Neg/subj			
1	n-	u-	u-	u-	a-	n/m-	nthu	person
1a	-	u-	u-	u-	a-	n/m-	Neo	(name)
2	ba-	b-	b-	b-	ba-	ba-	bathu	people
2a	bo-	b-	b-	b-	ba-	ba-	boNeo	Neo and others
3	n-	u-	w-	u-	u-	u-	nti	tree
4	mi-	i-	y-	i-	i-	i-	miti	trees
5	Ø	l-	l-	l-	li-	l-	zhani	leaf
6	ma-	a-	a-	a-	a-	a-	mazhani	leaves
7	chi-/i/ Ø	ch-	ch-	ch-	chi-	chi-	chibululu	lizard
8	zwi	zw-	zw-	zw-	zwi-	zwi-	zwibululu	lizards
9	N/ Ø	i-	y-	i-	i-	i-	mbgwa	dog
10	N-/dzi-/ Ø	dz-	dz-	dz-	dzi-	dzi-	mbgwa	dogs
11	li-	g-	gu-	g-	gu-	gu-	likuni	log
14	bu-	g-	gu-	g-	gu-	gu-	bushwa	grass
15	ku-	k-	ku-	k-	ku-	-	ku izela	to sleep
16	pa-	p-	ku-	k-	ku-	-	pa dula	by the granary
17	ku-	k-	kw-	k-	ku-	-	ku nzi	at home
18	mu-	k-	kw-	k-	ku-	-	mu ngumba	in the house
21	zhi-	l-	l-	l-	li-	li-	zhingwana	enormous child

2. Previous Analyses of Subject Markers.

This section takes a closer look at two analyses proposed for subject markers in Bantu, both of which I argue against, namely B&M (1987) and Zwart (1997). Before entering into a discussion of these two works, I first provide a brief discussion of the pro-drop phenomena and the claim that has been made to the effect that dislocation is related to the presence of agreement (Jelinek 1984, Baker 1996). First, I would like to point out that phenomena that have been analyzed as “topicalization” by some have been analyzed as “left dislocation” by others, thus leading to confusion about what topicalization and left dislocation are and how exactly they differ. In Bantu literature, one finds instances in which subjects in languages such as Chichewa are said to be topicalized (B&M 1987, Zwart 1997)

³ When the agreement marker *u-* combines with the tense/aspect marker *-a-*, phonologically we get *wa-*. Therefore, in the rest of this paper, when these two combine, I will indicate them as *wa* instead of *u-a*.

while in other works, subjects in other Bantu languages, e.g. Kinande, are said to be “dislocated” (Baker 2002). Perhaps what makes it even more difficult to distinguish the two is the fact that both are said to exhibit A’ characteristics. Chomsky (1977) distinguishes topicalization from left dislocation by positing that topicalization structures involve *wh* movement while left dislocation structures involve no movement. In addition, while left dislocation structures involve resumptive pronouns as shown in example (4), topicalization does not (example 5).

(4) As for this book, I really like it.

(5) This book, I really like.

In Bantu languages, there seems to be some consensus, at least by scholars who have raised the issue, that subjects in these languages are not in spec-TP but that they are in some A’ position. However, showing that subjects are either topicalized or left dislocated does not in itself constitute evidence that the controversial Bantu morphemes are or are not agreement morphology or resumptive pronouns. There is another layer of complication, of course — one’s theoretical orientation. B&M (1987) for example, whose theoretical framework is L(exical) F(unctional) G(rammar), analyze morphemes such as *ú* in the embedded clause of example (6) as the subject of the embedded clause. This is because of the completeness condition of LFG which holds that every argument which is lexically required must be present, in other words the existence of null elements is not acknowledged (Chichewa: B&M 1987 ex. 32a).⁴

(6) Mkángó uwu, alenje a - ku- gáníza kutí *ú* -ma- fúná
 Lion₃ this hunters₂ SM₂ -pres-think that SM₃-HAB want
 ku- gúmúla nyumbá yá mfûmu
 INF-pull.down house of chief
 ‘This lion, the hunters think that it wants to pull down the chief’s house.’

Baker (2002), on the other hand, comes to a similar conclusion as B&M with respect to the A’ status of subjects in Kinande, although he uses the term ‘dislo-

⁴ I use a uniform glossing convention with regards to indicating noun classes (that is, a number subscript indicates noun class or the agreement morphology associated with a specific noun class) in the data discussed in this paper. This might differ from the way the original authors glossed their data but I do it for clarity.

cated' to describe the position of subjects in this language. For Baker, however, the real subject of the sentence is not the agreement morpheme, but a null element *pro*. Baker assumes that the feature Agr is not an independent head, but is parasitic on the feature EPP. This means that Agr checks the nominative feature of T in Bantu languages in the same way that Agr is said to check the EPP feature of T in pro-drop Indo European languages such as Greek (Alexiadou and Anagnostopoulou 1998). According to Baker, since Agr checks nominative case in Bantu languages, only an NP that has no case, such as the empty category *pro* can occur in spec-TP. This is the category that is base generated in vP (depending on the verb type), later moving to spec-TP to check EPP features (see section 3.1 for a detailed discussion of Baker's analysis).

2.1 Bresan and Mchombo's analysis of SMs. B&M (1987) argue that subject markers in Chichewa sometimes function as simple agreement morphology, as in (8), while sometimes they are pronominal as exemplified in (9). They account for the agreement facts in Chichewa from an LFG theoretical point of view. According to these authors, in Chichewa, all simple [subject + verb] sentences are functionally ambiguous. The agreement marker functions as either an agreement marker relating the subject and the verb as in (8 = B&M 1987 ex. 1) or as a pronoun relating a topic NP to the verb. The latter function is illustrated in (9 = B&M 1987 ex. 32a).

- (8) Njuchi zi - ná -lúm -a alenje.

Bees₁₀ SM₁₀-past-bite -IND hunters
'The bees bit the hunters'.

- (9) Mkángó uwu, alenje a - ku- gáníza kutí ú - ma - fúná

Lion₃ this hunters₂ SM₂-pres- think that SM₃-HAB- want
ku- gúmúla nyumbá yá mfûmu
INF-pull.down house of chief

'This lion, the hunters think that it wants to pull down the chief's house'.

According to these authors, in LFG, the subject marker *zi* in (8) serves as agreement morphology between the subject NP *njuchi* and the verb *luma* because the subject and the verb have a "local" relation. "Locality" is defined in terms of proximity of the agreeing elements within the clause: that is, for grammatical agreement to obtain, the subject and the verb should be within the same clause. In (9) however, according to these authors, the verb *fúná* and the subject *mkángó uwu* are not in the same simple clause, hence the subject marker *ú* cannot be an

agreement marker between these categories. For these authors, this is one reason why the subject marker *ú* is not an agreement morpheme in (9) but is a pronoun which functions as the subject of the embedded clause. A second reason why B&M argue that *ú* in (9) is an incorporated pronoun is because of the “completeness condition” of LFG. The completeness condition holds that every argument which is lexically required must be present, in other words, this theory does not entertain the existence of null elements such as *pro* used in Minimalist theory. Thus, given the principle that every sentence requires an overt subject, some overt element in the clause has to fulfill the function of subject. Such an element is *ú* in (9), which the authors analyze as an incorporated pronoun.

The argument advanced by B&M regarding the proposal that subject markers can function as incorporated pronouns is not convincing for two reasons. First, B&M point out that in sentences where the verb is finite, the subject marker, which is the morpheme that expresses the subject and verb agreement relation, is obligatory. However, the verb *ǃúná* in the first embedded clause in (9) is finite, and one wonders why agreement is not required between this verb and the subject of the sentence, the incorporated pronoun *ú*. It is not clear why in (9) the incorporated pronoun *ú* blocks agreement morphology from showing up, resulting in two identical forms of *ú* in the embedded finite CP clause as illustrated in (10).

- (10) *Mkángó uwu, alenje a - ku- gáníza kuǃí *ú* - *ú* - ma - ǃúná
 Lion₃ this hunters₂ SM₂-pres-think that it₃ -SM₃- HAB-want
 ku- gúmúla nyumbá yá mfǃmu
 INF-pull.down house of chief
 ‘This lion, the hunters think that it wants to pull down the chief’s house.’

It therefore seems odd that a language which has obligatory subject agreement markers in finite clauses should have one exceptional case in embedded clauses in which the agreement does not show up.

Second, if *ú* is an incorporated pronoun, as B&M claim, it is not clear why a pronoun is obligatory, assuming incorporated pronouns are optional elements. Given that Chichewa, like other Bantu languages, is a pro-drop language, one would predict that since the *ú* in the embedded clause is a pronoun, it can be omitted without resulting in ungrammaticality. However, omitting *ú* in (9) results in ungrammaticality as attested in example (11).

- (11) *Mkango uwu, alenje a - ku- gáníza kuí ma- fúná
 Lion₃ this hunters₂ SM₂- pres-think that HAB-want
 ku- gúmúla nyumbá yá mfûmu
 INF-pull.down house of chief

‘This lion, the hunters think that it wants to pull down the chief’s house’.

The third objection to B&M’s analysis of *ú* as an incorporated pronoun stems from the fact that the justification for their claim is based on theory-internal reasons. Recall that according to LFG’s completeness condition, every argument which is lexically required must be overtly present, suggesting that this theory does not entertain null elements such as *pro*. Since Chichewa is a pro-drop language, LFG always has to identify some overt element to serve as a subject. The fact that this is a theory-internal argument weakens it. The data in (8-9) can be explained from a Minimalist perspective in a unified way by positing that the subject of the embedded clause is *pro* and that *ú* is agreement morphology relating the finite verb *fúná* and the null subject *pro*. Although such an analysis is not theoretically superior since it is also theory-internal in that it entertains the existence of null arguments such as *pro*, it at least takes care of the awkward problem of positing that finite verbs in embedded sentences do not require subject markers while subject markers are obligatory in other finite sentences.

2.2. On Zwart’s (1997) analysis of subject markers in Swahili. Zwart (1997), like B&M, analyzes Swahili subject markers as some kind of pronominal element which he likens to the resumptive d-word (*die/dat*) used in Dutch ‘topicalization’ constructions. According to Zwart, the subject marker in Swahili is a pronominal element which resumes the features of a previously mentioned entity, similar to the Dutch example (12 = Zwart 1997 ex. 20) which Zwart describes as a case of agreement *ad sensum*.

- (12) Dat meisje die is gek.
 DIST-NTR girl DIST-NNTR is crazy
 ‘That girl is crazy’. (DIST = distal, NTR = neuter, NNTR = nonneuter)

According to Zwart, agreement *ad sensum* such as in example (12) can be overruled by morphological agreement. When this happens, the result is example (13). Notice that in (12), *die* does not show agreement with the head noun *meisje*, which is neuter in gender (the pronoun *die* being non-neuter since it is feminine),

a rather unexpected outcome. In example (13 = Zwart 1997 ex. 22) however, *dat* shows agreement with *meisje* since they are both neuter.

- (13) Dat meisje dat is gek.
 DIST-NTR girl DIST-NTR is crazy

Similarly, Zwart analyzes the *wa* in the Swahili example in (14 = Zwart 1997 ex. 19) as a resumptive pronominal similar to *die* in (12).

- (14) Wa -le vi-jana wa -na -chez-a mpira
 SM₂-DIST 8-young SM₂-pres-play -IND ball₃
 ‘Those youngsters are playing ball’.

Notice that in (14), although the head noun of the NP, namely *vi-jana*, is a class 8 noun, it does not control the agreement on the verb as would normally be the case. Rather, the agreement on the verb *wanacheza* and on the demonstrative *wale* have the same *phi* features as class 2 (i.e. [+human], third person features). Thus, the agreement on both *wanacheza* and *wale* is semantically determined by the classification of *vi-jana* as [+human] and not by its grammatical class which is class 8. Zwart contends that Swahili (14) is similar to Dutch examples such as (12) where the agreement is not determined by the head noun; *meisje*. Zwart (1997) analyzes sentence (14) as a case of agreement *ad sensum*. Therefore, because of examples like (14), Zwart analyzes such sentences as cases of topicalization just like the Dutch example (13). He thus argues for the rather strong position that in fact agreement between the subject and the verb is not expressed at all in Swahili. This leads to the conclusion that all sentences with agreement markers in Swahili involve topicalization. But notice that the similarity between the Dutch example (12) and Swahili (14) only goes as far as the fact that the head noun *meisje* in Dutch and the head noun *vi-jana* in Swahili do not control agreement on the verb. Swahili example (14) differs from the Dutch example in at least three ways: First, the demonstrative *dat* in Dutch has the *phi* features of the head noun *meisje* while the Swahili demonstrative takes the features of noun class 2. Second, there is a pause after the noun *meisje*, and the pronoun *die* is stressed, just as is expected of topicalization structures as shown in example (15) (judgments from Annemarie Toebosch, p.c.). This is not the case in Swahili; there is no pause after the noun *vi-jana*, nor is the subject marker *wa* stressed (judgments from Sam Mchombo, p.c.). Third, *die/dat* in Dutch examples (12, 13) are optional, meaning

that example (12) is grammatical without these pronouns resulting in example (16: Toebosch, p.c.), a non-topicalized construction.

- (15) Dat meisje, die is gek.
 DIST-NTR girl DIST-NNTR is crazy
 'That girl, she is crazy'.
- (16) Dat meisje is gek.
 'That girl is crazy'.

In Swahili on the other hand, the subject marker is obligatory. Omitting it results in ungrammaticality as shown in example (17). Furthermore, even if the demonstrative were to be left out of example (14), the subject marker would still be a class 2 subject marker *wa-* as shown in example (18: Sam Mchombo, p.c.).

- (17) *Wa-le vi -jana -na -chez-a mpira
 AGR₂-DIST SM₈ -young -pres-play -IND ball₃
 'Those youngsters are playing ball'.
- (18) Vi-jana wa -na -chez-a mpira
 8 -young SM₂-pres-play -IND ball₃
 'Youngsters are playing ball'.

Another argument that Zwart uses to argue for the position that agreement between the subject and the verb is not expressed in Swahili involves so-called 'verbless' constructions such as (19).

- (19) Wa -po
 SM_{2,3}-Loc
 'They are here'. 'Here they are'.

According to Zwart, historically (19) had a copula *li-* which presumably got dropped from the language. Thus, originally (19) was like (20).

- (20) Wa -li -po
 SM_{2,3}-Cop.-Loc
 'They are here'.

If *li* got deleted from the language over time, it means that there is no verb/copula for the agreement morpheme *wa* to attach to as a subject marker. According to Zwart, it is typologically rare for an agreement affix to attach to a null verb. However, one might argue that rareness does not necessarily mean impossibility. It is possible that although the Swahili copula *li* got dropped phonologically from the language, it is syntactically present. One argument in favor of this analysis comes from a similar negated example in Ikalanga, a language similar to Swahili. For example, consider the Ikalanga example (21) which is similar to Swahili (20).

- (21) a. Ba - (y)a -po
 SM₂-pres. -there/exist
 ‘They are here/there’.
- b. I - ya -po
 SM₉-pres-there/exist
 ‘It is there’.

In (21), presumably the subject marker relates the null subject to a null copula whose syntactic presence is marked by the tense marker *ya*. Since tense is a property of the verb, it can only be that the copula is syntactically present although phonologically null. Therefore, the subject marker in (21) can qualify as agreement morphology since it has a null copula to attach to. Notice that the negative form of (21) shown in (22) does not exhibit the tense marker *ya*. This means that the tense marker in Ikalanga also has a zero allomorph in the negative.

- (22) a. A -ba -po
 Neg.-SM₂-there/exist
 ‘They are not here/there’.
- b. A - yi -po
 Neg.-SM₉-there/exist
 ‘It is not here/there’.

Since there is evidence for the existence of a null copula in (21), it would seem that (22), the negative form of (21), should also be analyzed as having a null copula and a null tense marker. I therefore argue that *ba* is agreement morphology in both (21) and (22) just as *wa* is agreement morphology in Swahili (19), where the copula must be a zero morpheme. The fact that the copula is not pronounced does not mean it is not syntactically present.

Another way of accounting for the facts in the “verbless” constructions is to posit principle (23).

- (23) A head of an XP triggers agreement on its predicate.

Given principle (23) we can account for the Ikalanga and Swahili sentences in (19-22) as follows: (19-22) have null subjects *pro* which head the subject NPs. *Pro* has class 2 third person plural features which are copied onto its predicate, the locative *po* in the form of the agreement morpheme *ba/wa*. This is the analysis that is adopted in the rest of this paper.

3. Agreement Morphology Within the Verbal Domain

In this section, I focus the discussion on agreement within the verbal domain, leaving the discussion of agreement outside of the verbal domain for section 4. I argue that what Zwart refers to as a resumptive pronoun is really agreement morphology expressing a relation between the head of an XP which functions as a grammatical subject of the sentence and the verb (see Demuth & Harford 1999, Baker 2002 for similar observations). First, I discuss agreement in finite verb sentences, contrasting these with non-finite sentences whose verbs are not marked for agreement (section 3.1). I then discuss existential constructions in section 3.2, and locative inversion in section 3.3. I do not discuss quasi-passives since Ikalanga does not have this type of construction. However, I note that even in quasi-passives exemplified in (24), what Zwart refers to as resumptive pronouns is simply agreement morphology expressing the relation between the subject of the sentence (which is the logical object of the sentence, *vyakula*) and the predicate of the sentence.

- (24) Vy-akula vi -li -kul-a wa-toto
 8 -food SM₈-past-eat- IND 2 -child
 ‘The children ate the food’.

3.1 Agreement in simple declarative finite sentences. Before I undertake the discussion of agreement in simple declarative sentences in Ikalanga, I first present some general facts about how Ikalanga expresses tense-aspect. Like other Bantu languages, Ikalanga makes a distinction between the recent past and the remote past. The recent past is expressed by attaching a prefix *-a-* to the verb, as shown in example (25a). The remote past on the other hand makes use of both the *-a-* prefix plus the morpheme *-ka-*, which is also prefixed to the verb, as shown in example (25b).

- (25) a. W -a -bona nyoka.
 SA_{2s}-T/asp-see snake₉
 ‘You (just) saw a snake’.
- b. W -a - ka -bona nyoka.
 SA_{2s}-T/asp-past-see snake₉
 ‘You saw a snake’.

Agreement between the verb and the subject is obligatory in finite sentences. The agreement morpheme *w-* cannot be omitted in example (26) below. This is the case in both simple finite declarative sentences and finite embedded sentences.

- (26) a. Neo w -a - ka - bon- a mbisana.
 Neo_{1a} SM_{1a} -T/asp- past - see -FV boy₁.
 ‘Neo saw a boy.’
- b. *Neo a - ka - bon- a mbisana.
 Neo_{1a} T/asp- past - see -FV boy₁.

In (26) the subject marker *u-* shares three syntactic properties, that is *phi* features, with the subject NP *Neo*, namely gender, third person, and singular. Other Bantu languages such as Chichewa (27 = B&M 1987 ex. 1), Kinande (28 = Baker 2002 ex. 11) and Swahili (29 = Deen 2004 ex. 2) also show similar agreement facts.

- (27) Njuchi {zi,*Ø} - ná -lúm -a alenje.
 Bees₁₀ SM₁₀ -past -bite -IND hunters₂
 ‘The bees bit the hunters’.
- (28) Abakali {ba,*Ø} -a-gul-a eritunda
 woman₂ SM₂ -T-buy -FV fruit₅
 ‘The women bought a fruit’.
- (29) Kibaki {a,*Ø} -li - shind- a
 Kibaki₁ SM₁ -past-win -IND
 ‘Kibaki won’.

An embedded sentence with a finite verb similarly displays agreement morphology between the subject NP and the verb. For example, consider (30).

- (30) Neo u -no - alakana kuti botichara ba - ka- tenga mota.
 Neo_{1a} SM_{1a}-pres-think that teacher_{2a} SM_{2a}-past-buy car₉
 'Neo thinks that the teachers bought a car'.

In (30) the *phi* features of the matrix syntactic subject NP *Neo* are copied onto the agreement marker *u*. Similarly, the *phi* features of the embedded syntactic subject NP *botichara* are copied onto the agreement marker *ba* since this clause is a finite clause. Agreement morphology, however, is not observed on non-finite clauses such as example (31).

- (31) Neo u -no - shaka ku- tenga mota.
 Neo_{1a} SM_{1a}-pres. - want to - buy car₉
 'Neo wants to buy a car'.

Notice that agreement shows up only in the matrix clause in example (31) since the verb is finite but does not show up in the infinitive clause. A question that arises at this point is why only finite verb constructions trigger agreement in Bantu. Baker (2002) proposes that XPs that move to the specifier of TP trigger agreement.⁵ He proposes an agreement parameter for Indo European languages vs. Bantu languages stated in (32), specifically, that agreement in Bantu is part of the EPP feature of T while it is part of the nominative case feature of T in Indo European languages.

- (32) a. Tense agrees with the nominative NP in Indo-European.
 b. Tense agrees with its specifier in Bantu.

This parameter says that the NP which checks nominative case in Indo-European languages is the same NP that controls agreement. However, this NP need not be in spec-TP (see example 33). In Bantu languages, on the other hand, whatever is in the specifier of TP definitely controls agreement on the verb (see example 34). This proposal is consonant with the analysis adopted in this paper,

⁵ See also Binkert (1989) for arguments regarding why non-finite sentences do not have agreement. According to Binkert, non-finite sentences have no agreement because they do not have subjects.

namely that the subject, which is the NP that occurs in the specifier of TP in Bantu languages, controls agreement on the verb.

(33) On the bed lay the roses John bought.

(34) Mu-bulawo ku -gele ithunya Joni cha -a -ka -tenga
 18 -bed SM₁₈ -sit flower₇ John_{1a} Agr₇ -SM₁ -past-buy
 ‘On the bed sits the flower that John bought’.

Notice that in example (33), the agreement is not controlled by the prepositional phrase *on the bed*; instead, it is controlled by the logical subject of the sentence, *the roses*, which does not occupy spec-TP. In (34), on the other hand, the grammatical subject of the sentence, the phrase *Mu-bulawo*, controls agreement on the verb. Thus, given Baker’s (2002) analysis, we can account for the lack of agreement in non-finite sentences in both Indo-European and Bantu languages. Restricting the discussion to Bantu languages, a non-finite verb such as *ku-tenga* in (31) does not have an EPP feature to be checked if this sentence is [-tense]. If a verb lacks tense and by extension lacks the EPP feature, a feature which harbors agreement, then the null subject *PRO* of the embedded clause in (31) does not need to raise to spec-TP (which is [-tense]) to check EPP and agreement.⁶

Another type of non-finite clause that I would like to discuss in relation to agreement morphology is the imperative construction. Agreement morphology or “resumptive pronouns” do not show up in imperative constructions. For example, consider the sentences in (35).

(35) a. Zhalila nkoba.

Close door
 ‘Close the door!’

b. Zhalila-ni nkoba.

Close -you_{pl} door
 ‘Close the door!’ (plural subject)

c. Ingwi ma -zhalila nkoba.

You_{pl} 2_{pl} -SA-close door
 ‘You_{pl} have closed the door.’

⁶ See Bošković (1997) and Pires (2002) for the view that non-finite clauses can be [+tense].

- d. *Ingwi ni-zhalila nkoba.
 You 2_{pl}-close door
 ‘You have closed the door.’

Note that it might seem like example (35b) has agreement morphology *ni* which is marked for number and person. However, *ni* in (35b) is an argument of the verb. Evidence that *ni* is an argument of the verb and not inflectional morphology comes from two sources: its position in relation to the verb and, the argument structure of the verb *zhalila*. Verbal inflectional morphology strictly precedes the verb stem in Bantu and cannot occur in any other position. However, note the ungrammaticality of (35d) if we place *ni* in the canonical subject agreement position. In addition, the only agreement form associated with 2nd person plural is *ma* as illustrated in (35c).

I therefore conclude that *ni* is a clitic (i.e. some kind of pronoun and therefore requires a host, in this case, the verb *zhalila*). The facts in (35a&b), that is, the lack of agreement in imperative constructions is not something that is unique to Ikalanga but seems to apply to other Bantu languages as illustrated in Bukusu (36 = Wasike’s forthcoming ex. 5a &b).

- (36) a. lim -a
 Dig -imp.sg
 ‘You (sg.) dig!’
 b. lim -e
 Dig -imp.pl
 ‘You (pl) dig!’

The lack of agreement in imperatives in Bantu languages such as Ikalanga can be explained easily if we assume with Baker (2002) that agreement is not an independent head and that instead it is packaged with another feature such as EPP. If agreement is a spec-head relation, this means any XP that triggers agreement on the verb has to move to spec-TP in order to check both the tense and agreement features of V. However, imperatives are tenseless and from the data in (35) above agreement-less. This is consistent with Baker’s analysis that agreement is packaged with some feature in T. If a clause is [-tense], then it goes without saying that it is [-EPP], and by extension agreement-less. Just like infinitive clauses, imperatives are tenseless. This means that neither the null subject *pro* of imperatives

such as in example (35a), nor the clitic subject *ni* of (35b), need to raise to spec TP, which has [-EPP] and [-AGR] features. This way, the lack of agreement morphology in imperatives is accounted for in a principled way. However, if agreement morphology is analyzed as resumptive pronouns, it is not obvious how such an analysis can account for the lack of “resumptive pronouns” in imperative sentences such as (35).

3.2 Existential constructions. As noted in Baker (2002), agreement in Indo-European languages is significantly different from agreement in Bantu languages. One such major difference is observed in expletive constructions such as (37) and (38 = Zwart 1997 ex. 31b).

(37) There are unicorns in the garden.

(38) Er zitten mensen in de tuin
 there sit-PL people in the garden

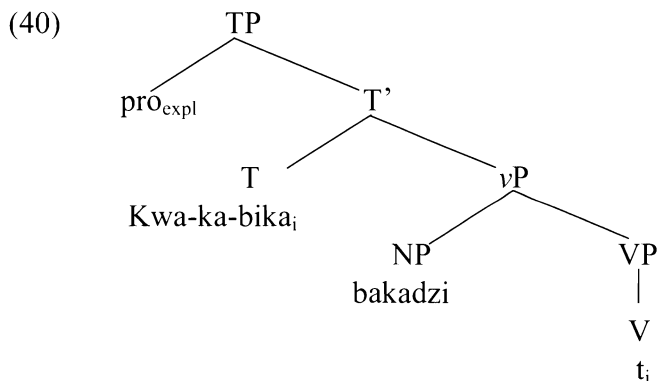
The finite verb agrees with the post-verbal subjects *unicorns* in (37) and *mensen* ‘people’ in Dutch (38). This is different from Bantu languages such as Ikalanga, where the agreement morphology in such constructions is with the grammatical subject, and not with the post-verbal subject (i.e. the thematic subject) as seen in (39) (see Zwart 1997 for similar observations).

(39) *pro* kwa - ka - bika bakadzi.
*pro*_{expl.} AGR_{expl} -past-cook women₂
 ‘There cooked women’. ‘Women cooked’.

I assume that since Ikalanga is a pro-drop language, the agreement *kwa* in (39) is with the grammatical subject, an expletive *pro* which is in the specifier of TP and not with the thematic subject *bakadzi* ‘women’ which is VP internal.⁷ If *kwa* were a resumptive pronoun as Zwart (1997) would have it, it is not clear which previ-

⁷ I assume that since expletives do not have theta roles, they are base generated outside of VP, that is, they are base generated in spec-TP. This means that the expletive *pro* in (39) does not undergo any movement since it is base generated in spec-TP. This constitutes a hitch to the analysis proposed in this paper in which agreement is checked when an XP or its head moves to a specific position to check its *phi* features. However, notice that if expletive *pro* occupies spec-TP, it blocks movement of any other XP into this position.

ously mentioned entity's features the so called resumptive copies in (39), since there is no previously mentioned entity. Thus, the structure of (39) is (40).



3.3. Locative inversion. One of the key points of Zwart's argument that agreement between the subject and the verb is not expressed in Bantu languages comes from locative constructions. Bantu locative inversion constructions have been a topic of theoretical interest, as evident from the numerous papers that discuss this topic, among them Carstens (1997), Bresnan and Kanerva (1989), Bresnan (1994), Demuth (1990), Machobane (1994). There are at least two reasons why locative inversion has generated much theoretical interest. One is that locatives behave like nouns in that they fall into specific classes. The second reason, probably the stronger of the two, is that like nouns, they tend to control agreement on the verb in both locative inversion constructions and on their modifiers.

In Ikalanga (and other similar languages, such as Chichewa), locatives fall into three classes: class 16, whose prefix is *pa*, class 17, whose class prefix is *ku*, and class 18, whose class prefix is *mu*. The following data from Ikalanga (41), Shona (42), Swahili (43 = Zwart 1997 ex. 32) and Kinande (44 = Baker 2002 ex. 25) illustrate the fact that locatives control agreement on their predicates just like nouns.⁸ Notice the difference between Ikalanga and Shona in terms of locative agreement. In Shona, the subject marker copies the morphological shape of the noun class prefix of the locative, class 18. As pointed out in the introduction, Ikalanga locative classes (16, 17 and 18) take a default agreement *k-*.

⁸ The class of the verb agreement is not controlled by the noun class prefix in Swahili.

- (41) Mu-danga kwa -ka -izela mbudzi.
 18 -corral₅ SM₁₈ -past -sleep goats₁₀
 'Goats are asleep in the corral'. (literally, In the corral sleeps goats.)
- (42) Mu-danga mwa-ka -gara mbudzi.
 18 -corral₅ SM₁₈ -past -stay goats₁₀
 'Goats live in the corral'. (literally, In the corral lives goats)
- (43) Mw-itu -ni m -me -lal -a wa-nyama
 wood₃ -loc. SM₁₈ -perf -sleep -IND animal₂
 'Animals are asleep in the wood'.
- (44) Omo-mulongo mw -a -hik -a (?o-)mu-kali.
 18 -village SM₁₈ -past-arrive-FV AUG woman₁
 'At the village arrived a woman'.

Zwart proposes that locative inversion constructions in Germanic illustrated in example (45 = Zwart 1997 ex. 31a) and those in Bantu are comparable, and that if this is the case, it is puzzling for SM₁₈ in Swahili sentences like (43) to be analyzed as a subject marker since the (thematic) subject is *wa-nyama* 'animals' in this example. Given that in (43) the thematic subject *wa-nyama* does not trigger agreement on the verb, unlike the Dutch thematic subject *mensen* in (45) which does, Zwart argues that this is evidence that in Swahili subject agreement is not expressed at all.

- (45) In de tuin daar zitten mensen
 in the garden DIST-Loc sit-PL people.

I argue that contrary to Zwart's proposal that Germanic and Bantu locative constructions are comparable, they are in fact not, as evident from the data in (41-44). It is perhaps true that in Dutch the morpheme *daar* is some kind of resumptive pronoun, as Zwart analyzes it, especially if (45) is a case of topicalization of the locative. Notice however, that the verb *zitten* shows agreement with the post-verbal subject *mensen* since verbs agree with post-verbal subjects in locative inversion constructions in Dutch. On the other hand, verbal morphology indicating tense and agreement in Bantu is prefixal, not suffixal. Therefore, there is no morpheme in the Bantu examples in (41-44) which is equivalent to the Dutch resumptive pronoun *daar* in example (45), suggesting that the examples in (41-44)

are not parallel in structure to the Dutch example (45), i.e they are not instances of topicalization. Perhaps what we ought to ask at this point is, “What is a resumptive pronoun?” Crystal (1991: 300) defines a resumptive pronoun as “a term used in grammatical analysis to refer to an element or structure which repeats or in some way recapitulates the meaning of a prior element”. According to Crystal, in the sentence ‘Mary, I know her’ the pronoun *her* is a resumptive pronoun. That said, Bantu languages such as Ikalanga do exhibit a morpheme equivalent to *daar* in example (45). Consider the Ikalanga example (46).

- (46) a. Ku -minda Neo u -no -ku -da.
 Loc₁₇ -farms₄ Neo_{1a} SM_{1a} -pres.-Agr₁₇-like
 ‘At the farms, Neo likes it’.
- b. Neo u -no -da ku -minda
 Neo_{1a} SM_{1a} -pres.-like loc.₁₇- farms₄
 ‘Neo likes at the farms’.

In example (46) the clausal agreement is triggered by the thematic subject NP *Neo*, as in the Dutch example (45). At the same time, a resumptive pronoun *ku*- appears as a clitic on the verb *-da*. Example (46) provides a closer parallel to the Dutch example (45) than do examples (41-44). More importantly, notice that the resumptive pronoun can be omitted in a non-topicalized sentence such as (46b). However, Zwart does not analyze examples (41-44) as cases of topicalization but rather as cases of left dislocation. In the Bantu literature, examples such as (46) have been analyzed as cases of topicalization (see B&M 1987, Demuth & Harford 1999, Baker 2002). One wonders therefore whether it is possible that Bantu languages such as Ikalanga and Swahili perhaps lack the kind of topicalization found in Dutch. Given the argument based on example (46), I conclude that the morphemes glossed as SM₁₈ in (41-44) express agreement between the verb and the subject in these sentences, consistent with the analysis proposed in this paper. If agreement is seen as expressing a relation between the verb and the subject of the sentence, then contrary to Zwart (1997), there is indeed nothing puzzling about the agreement facts in locative inversion constructions in Bantu.

To summarize, I have argued that the morphology commonly referred to as “subject markers” in the literature is indeed agreement morphology and not resumptive pronouns. I have also argued that there is no resumptive pronoun equivalent to the Dutch pronoun *daar* in Bantu which warrants analyzing Bantu locative inversion in sentences (41-44) as topicalization constructions unless one

considers the case of resumptive locatives such as in example (46a) in which the locative itself does not take up the subject position but moves to another position to the left of the preverbal subject. Specifically, I gave data involving a locative example in which a resumptive pronoun surfaces, and showed the similarity between such a sentence with the topicalized Dutch example in (45). The point of this discussion was to show that whatever occupies the subject position, i.e. spec-TP, in Bantu languages controls agreement on the main clause verb.

4. The Interaction of Subject Markers with Mood and Negation

The final argument which I present as evidence that “subject markers” are not resumptive pronouns but agreement morphology comes from an investigation of the interaction of the subject markers with other syntactic phenomena. A closer look at how “subject markers” interact with syntactic phenomena such as mood and negation reveals behavior consistent with them being agreement morphology rather than pronouns. In this section, I focus on subject agreement markers of classes 1, 1a, 2, and 2a, which are +human noun classes. There are two idiosyncratic forms of the 3rd person singular subject agreement marker for classes 1 and 1a, *u* and *a*, the morphological form of which is determined by mood or negation.

4.1 Mood. I begin the discussion by investigating the interaction of subject markers with mood. Class 1 (human 3rd person singular) subject NPs in sentences in the indicative mood either take the agreement marker *u-* or *w-a-*, depending on aspect, but they never take the agreement marker *a*. Class 1 subject NPs in subjunctive sentences (47) and certain WH-interrogative sentences (48a,b), however, take the agreement marker *a*. The allomorph *a-* in the subjunctive occurs even in bare subjunctives such as (47c). The allomorph *a-* in interrogatives occurs only in sentences in which the WH phrase is extracted. When the WH phrase is *in-situ*, as in (48c), then the *a-* allomorph does not surface. Instead, we observe the regular agreement morpheme *u-*.

- (47) a. Neo (ng)a - a - bik -e.
 Neo_{1a} should -SM_{1a}- cook-subjunctive
 ‘Neo should cook.’
- b. *Neo nga - w-(a) - bik -e.
 Neo_{1a} should-SM_{1a} - cook -subjunctive
 ‘Neo should cook.’

- c. A -bik -e.

SM₁-cook-subjunctive

‘He/she should cook’.

- (48) a. I -ni Neo cha -a -no - bika?

Foc-what₇ Neo_{1a} Agr₇ -SM_{1a}-pres - cook

‘What is Neo cooking?’

- b. *I -ni Neo cha -u -no - bika?

Foc-what₇ Neo_{1a} Agr₇ -SM_{1a}-pres- cook

‘What is Neo cooking?’

- c. Neo u -no -bika -ni?

Neo_{1a} SM_{1a}-pres.-cook -what

‘What is Neo cooking?’

The ungrammaticality of (47b) and (48b) shows that subject NPs of subjunctive and extracted interrogative clauses do not take the agreement markers *u*. This indicates that agreement is sensitive to change in the morphological mood of the verb. The fact that the subject marker has morphophonological idiosyncratic forms controlled by syntactic phenomena such as mood provides evidence that they are agreement prefixes, that is, they form part of the verb and are not independent syntactic units (i.e. pronouns). Zwicky and Pullum (1983) make the observation that inflectional affixes such as past tense forms (*go* ~ *went*, *talk* ~ *talked*) and plural forms (*mouse* ~ *mice*, *goose* ~ *geese*) are morphophonologically idiosyncratic. That the substitution of *a-* for *u-* is a morphological idiosyncrasy is further shown by (49), where the 2nd person singular *w-* is not subject to replacement.

- (49) I -ni cha - w -a - ka - bika?

Foc-what₇ Agr₇ -SM_{2s} -past-past -cook

‘What did you cook?’

4.2 Negation. 3rd person singular subject NPs of negated declarative sentences also take the agreement marker *a* (50a). The ungrammatical (50b) illustrates that a subject NP in a negated sentence is not compatible with the agreement markers *w-* or *u*.

- (50) a. Neo a - *a* -to - bika.
 Neo_{1a} Neg.-SM_{1a}-pres- cook
 ‘Neo does not/isn’t cook(ing).’
- b. *Neo a- *w-a/u* - to - bika.
 Neo_{1a} Neg SM_{1a} -pres- cook
 ‘Neo does not/isn’t cook(ing).’

Since the negation morpheme and the agreement morpheme take the same form in (50a), we can tease them apart by using a plural subject NP as in (51).

- (51) Bo-Neo a - *ba* -to -bika.
 Neo_{2a} Neg-SM_{2a} -pres-cook
 ‘Neo and others do not/are not cook(ing).’

The second *a* is the one that changes to *ba* agreeing in number with the subject NP, which is now plural, leading us to conclude that it (the second *a* in (50a)) is the subject marker.

From the discussion above, it is clear that the form of the subject marker varies with syntactic phenomena such as mood (subjunctive and focused interrogatives) and negation. The fact that the subject marker changes in response to changes in mood is behavior that is characteristic of standard agreement morphology and not resumptive pronouns. Second, the fact that the subject marker is obligatory distinguishes it from resumptive pronouns/incorporated pronouns since these two are not obligatory, at least in Ikalanga. Based on these facts, I conclude that subject markers are agreement morphology and not resumptive pronouns. In the next section I turn the discussion to agreement within the DP.

5. Agreement Outside of Verbal Morphology

One of the reasons why Zwart argues that subject markers are not agreement morphology is because of their distribution. Specifically, Zwart points out that subject markers cannot be agreement markers because although they do occur on the verb, they also occur outside of the verbal domain, among other places in DP-internal positions. The observation that agreement morphology occurs outside verbal morphology is indeed an accurate one. However, Zwart confuses clausal agreement with agreement on DP modifiers, these being sometimes homo-

phonous. Thus, although agreement morphemes within DP are sometimes homophonous with subject markers, they are not *subject markers*; they are still DP agreement morphemes that take the form of the subject marker of the inherent head noun. As already pointed out in the introduction, the fact that DP-internal agreement is sometimes homophonous with subject markers is a phonological matter and is not significant in terms of the syntactic mechanism for agreement. What is important is that in both cases, the agreement relation is realized in a specific configuration; the spec-head configuration.

The discussion in this section focuses on DP-internal agreement. It specifically focuses on cases that Zwart uses as evidence for the argument that “subject markers” are not agreement morphology but are resumptive pronouns. I use the same data that Zwart uses in his arguments to argue for the view that what he calls resumptive pronouns is agreement morphology holding between a head of a DP and its modifiers. The agreement on the modifiers is checked when the head noun undergoes movement for feature checking.

It is well known that noun modifiers in Bantu languages such as Ikalanga, Setswana and Swahili show agreement with the noun they modify; for example, adjectives, demonstratives and quantifiers show agreement with the nouns they modify. In this section, I show that the distribution of agreement morphology within the DP is not a puzzling fact, and that it can be understood in light of the analysis proposed in this paper, namely that agreement is a relation realized in a specific configuration which holds following head or XP movement. As already noted, XP/head movement is motivated by feature checking. I begin the discussion by investigating agreement between a head noun and its adjective modifiers.

5.1 Adjectives, relative clauses and agreement. Nouns can be modified in two ways in Ikalanga: by the use of an adjective which can copy the noun prefix (example 52) or a stative verb which, as expected, takes the agreement morphology similar to that observed between the subject NP of a sentence and its finite verb as shown in example (53).

- (52) N-lume n-lefu
 man₁ tall₁
 ‘tall man’

- (53) ngwanána wá - ká - náka
 girl₁ Rel.₁-past-beautiful
 ‘beautiful girl’ (“Girl who is beautiful”)

Adjectival agreement does not take the form of the “subject marker”. Instead, it copies the class prefix of the noun as shown in example (52). A question that comes to mind then is whether in Zwart’s analysis the noun class prefix *n-* on the adjective *-lefu* in (52) is analyzed as a resumptive pronoun. I leave aside agreement which manifests itself as a copy of the noun prefix and focus the discussion on the stative verb type since this is the type that Zwart discusses. Turning to example (53), I will assume that such sentences are cases of relativization, like the Setswana example (54) and Swahili example (55 = Zwart 1997 ex. 11b).

- (54) Ngwanyana yo - montle
 girl₁ Rel.₁ - beautiful
 ‘beautiful girl’ (literally “Girl who is beautiful”)

- (55) Mi-ti amba-yo i -ta -fa -a
 tree₄ comp -Rel₄ SM₄-Fut-suffice-IND
 ‘Trees which will do’

Evidence that a clause such as Ikalanga (53) should be treated as a relative clause comes from the fact that *kunaka* is a fullblown verb which takes the usual verbal morphology (for example, tense, as shown in this example) and negation. Thus (53) can be negated as follows:

- (56) Ngwanáná ú -sá -ká -náka.
 Girl₁ Rel₁-Neg.-past-beautiful
 ‘The girl who is not beautiful’

Ikalanga forms relatives in exactly the same way as example (53). For example, consider (57a), an example of object NP relativization and example (57b), a case of subject relativization. Both of these sentences are similar to example (53) both structurally and in terms of tone. I therefore conclude that in order for stative verbs to be used to modify nouns in Ikalanga, the clause takes the form of a relativization structure.

- (57) a. Nlúmé Nchídzi wá -á -ká - bóna
 man₁ Nchidzi_{1a} Rel₁-SM₁-past-see
 ‘The man that Nchidzi saw’

b. Nlúmé wá -ká -bóna Nchídzi

man₁ Rel₁ -past-see Nchidzi

'The man who saw Nchidzi'

I assume the analysis of relative clauses proposed in Kayne (1994) in which the head noun of the relative clause occupies the specifier of a DP which is in the specifier position of CP. For concreteness, let us use example (57a) to show how this analysis applies to the Ikalanga data. Following Kayne's analysis, the DP which contains the NP *nlume* of the relative clause in (57a) is base generated as a complement of the verb *bóna*. This DP then moves to spec-CP. Further movement takes place within the moved DP; that is, the NP *nlume* then moves to the specifier of DP. The structure of this relative clause is shown in (58).⁹

(58) [CP [DP nlúmé_i [D' [D ∅ [NP t_i]]]] C [XP Nchídzi [VP wá- á- ká- bóna t_j]]]

There are no overt relative pronouns in Ikalanga. Relativization is indicated by agreement morphology and tone. There are two tone distinctions between a declarative sentence and a relativized clause. In the declarative sentence, the tense morpheme has a low tone while the second syllable of the verb *bona* has a high tone. In relative clauses, the high tone of the relative agreement morpheme spreads to the tense-aspect prefix *ka*, while the second syllable of the verb stem *bona* takes a low tone. Compare example (57b) with (59).

(59) Nlúmé wá - ka -bón-á Nchídzi.

Man₁ SM₁ - past -see -FV Nchidzi₁

'The man saw Nchidzi'.

Going back to the issue of whether what we observe in (57) is agreement morphology or a resumptive pronoun, I argue that the *wá* in this sentence is agreement morphology which holds between the null relative pronoun and its predicate, that is, its TP complement. Kinyalolo (1991) makes a similar observation regarding WH sentences in KiLega, that WH sentences other than direct questions involve a null WH operator and that WH agreement is obligatory in such sentences because it serves to identify and license the null operator. The discussion above makes one wonder whether agreement within the relative clause should really

⁹ I have used XP instead of IP/TP in example (58) because it is not clear that the subject NP *Nchidzi* is in IP/TP in such sentences.

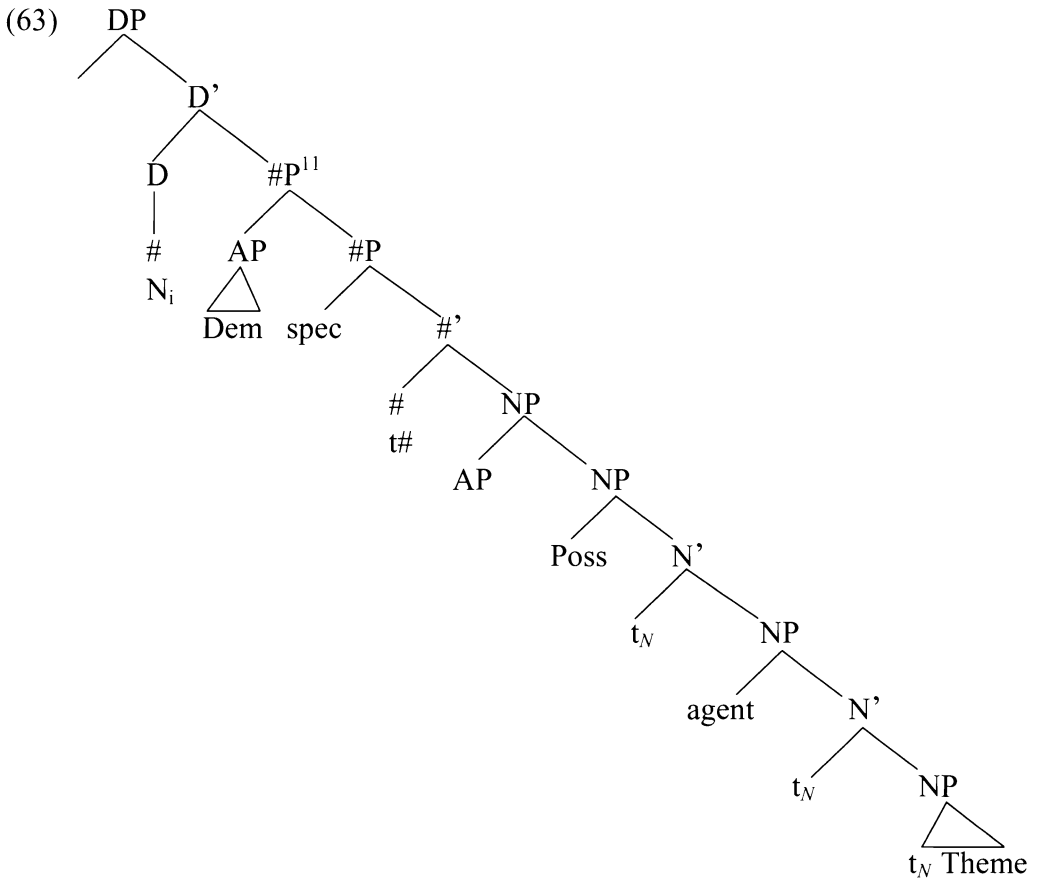
even be treated as agreement outside of the verbal domain. It would seem that agreement within the relative clause is not really different from agreement between the subject and its verb since the relation within the relative clause is that of a subject (the null relative pronoun) and its predicate (its TP complement). Therefore that the agreement morphology within the relative clause takes the form of the “subject marker” should not come as a surprise at all. The rest of this section therefore focuses on agreement which does not involve a predication relation but holds of a head noun and its modifiers, namely demonstratives and quantifiers.

5.2 Demonstratives, quantifiers and agreement within DP. Nouns in Bantu languages also show agreement with their demonstratives and quantifiers. I begin by discussing agreement between the demonstrative and the head noun in Bantu languages such as Ikalanga (60), Setswana (61) and Swahili (62). Zwart uses examples such as Swahili (62 = Zwart 1997 ex. 9a) to argue that a morpheme such as *u-*, which is the morpheme that indicates the subject agreement relation for class 3, is in fact not subject agreement. While it is true that *u-* is the morpheme that is used to express the subject-verb agreement relation in both Swahili and Ikalanga if the subject NP is a class 3 noun, it is also true that the *u*-s in (60) and (62) express a relation between the head nouns and their demonstratives; in other words, this is a case of morphological homophony between the head noun agreement and clausal agreement.

- | | | |
|------|---|----------|
| (60) | Nti u -wowuje
tree ₃ Agr ₃ -Dem
‘that tree’ | Ikalanga |
| (61) | Setlhare se -le
tree ₇ Agr ₇ -Dem
‘that tree’ | Setswana |
| (62) | m-ti u -le
tree ₃ Agr ₃ -Dem
‘that tree’ | Swahili |

The agreement pattern observed in the DPs above can be accounted for if we assume the analysis of Bantu NPs proposed in Carstens (1991, 1993). Carstens proposes that although NPs in Bantu do not have articles such as *a/an* or *the*, they are

nevertheless DPs headed by an empty D^0 .¹⁰ The structure proposed for the Bantu DP is (63 = Carstens 1997 ex. 39).



Carstens (1993) argues that the surface structure of Bantu DPs is derived by movement of the head noun to $\#^0$ (to check the number feature) and finally to D^0 (to check the determiner feature). Let us turn to the data in (60-62) to find out how the analysis of the DP in (63) can be used to explain agreement between the head noun and demonstratives. If Carstens is correct, we can account for the agreement in demonstratives by assuming that in examples (60-62), since the demonstrative is adjoined to $\#P$, the number features of the demonstrative are checked when N adjoins to $\#^0$ before raising further to adjoin to D^0 where it

¹⁰ See Carstens (1991, 1993) for arguments regarding why Bantu NPs are DPs.

¹¹ # represents “number”.

checks its D feature. Notice that this checking takes place in a spec-head relation since N adjoins to the head # and Dem (demonstrative) is adjoined to Spec #P. The result of N raising is shown in (64).¹²

(64) $[_{DP} D+\# +N_t, [_{\#P} [XP_{Dem}] \# +N_t, [_{NP} N_t]]]$

Agreement of the head noun with quantifiers (shown in 65-67) can also be explained straightforwardly using the DP analysis of Carstens (1993).

(65) mbili w -ose Ikalanga
body₃ Agr₃-all
'(my) whole body'

(66) Mmele o -tlhe Setswana
body₃ Agr₃-all
'(my) whole body'

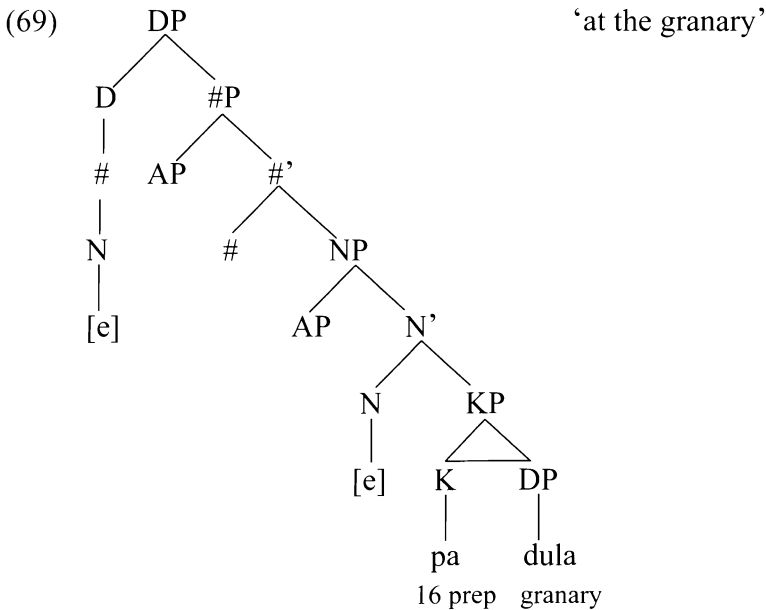
(67) m-wili w -ote Swahili
body₃ Agr₃-all
'(my) whole body'

In (65-67), the quantifiers *wose* (in Ikalanga), *otlhe* in Setswana and *wote* in Swahili modify the head nouns *mbili*, *mmele* and *mwili* respectively. Just as in examples (60-62) above, the head noun raises to # to check its # feature in a spec-head relation before proceeding to its final landing site, D⁰. The agreement feature of the quantifier (which I assume is adjoined to NP) is presumably checked in a spec-head configuration at LF when the quantifier raises to occupy a scope position. Quantifiers are analyzed as operators that bind variables, and thus, in order to be interpreted, they need to move from their base position and occupy a position that gives them the appropriate scopal interpretation (May 1985). I therefore assume that it is in the course of quantifier raising that the quantifier phrases in (65-67) adjoin to spec-#P and check their number feature in a spec-head relation. (68) shows the surface structure after N and quantifier raising.

(68) $[_{DP} D+\# +N_t, [_{\#P} [QP] \# +N_t, [_{NP} [QP] N_t]]]$

¹² A bar through a category, e.g. \bar{N} indicates that that category is a copy of a moved category. Note that only the relevant projections of DP have been used in (61).

5.3 Agreement within the locative phrase. Agreement within the locative phrase can also be understood in light of the analysis proposed in this paper coupled with Carstens' (1997) analysis of Bantu locatives. Carstens (1997) proposes that locatives are NPs headed by an empty place noun [N_e]. If locatives are NPs, that makes them DPs too. In addition, if [N_e] is the head of locative NPs, then [N_e] controls agreement on locatives in a way similar to the head noun controlling agreement on its modifiers in other DPs. The structure of locatives is shown in (69).



According to the analysis in (69), locative prefixes *pa*, *mu*, *ku* are syntactic heads independent of their DP complement. The prefixes are *phi*-feature-bearing heads which identify the empty place noun [N_e]. If the analysis adopted in this paper is correct, the empty [N_e]s (which are the heads of the locative phrases) control the agreement on their predicates.

- (70) *pa -nshá pá-chénachêna*
 Loc₁₆-dwelling place₃ 16 -white
 ‘at the white dwelling place’ (Ikalanga)

(71) pa-mushá apo p -ósé p-a-ká-chén-a
 16 - home₃ that₁₆ 16 -all AGR₁₆-white
 ‘at that whole white home’

(72) pa-mu-dzi p -athu p-ose
 16-3 -village 16-our 16-all
 ‘at all of our village’

Given (69) therefore, the agreement in examples (70-72: 71 = Carstens 1993 Shona ex. 51a; 72 = Carstens 1993 Chichewa ex. 35a) can be explained straightforwardly. The Ikalanga data in example (70) shows how agreement between [N_e] and the modifier of the locative *pachenachena* is realized. [N_e] is base generated as the head of NP, as shown in (69). I assume that the adjective *pachenachena* is adjoined to spec NP. Like other nouns in Bantu, [N_e] has a D feature and number features that need to be checked. This means that [N_e] raises first to #⁰ where it checks its number features before raising to D⁰. I assume that when [N_e] checks its # feature in a spec-head relation, the adjective *pachenachena* simultaneously gets its agreement features checked. However, this does not give us the right word order especially if we assume that adjective phrases are adjoined to NP as shown in (69). Carstens (1997) proposes that the covert D of locative DPs must have some feature which needs to be checked with a feature of the locative phrase (i.e. KP in 69). This requires that the locative phrase KP move to spec-DP. This movement results in the structure shown in (73).

(73) [_{DP}_{loc} [_{KP}] D N_e+# [_{#P} [_{AP}] {N_e} # [_{NP} [_{AP}] N_e t_{KP}]]]]]

To summarize, I have argued that agreement that occurs outside the verbal domain (that is, DP-internal agreement) is sometimes homophonous with subject agreement; but it is still nevertheless agreement with the head noun and not resumptive pronouns as Zwart would have it. I also pointed out that it is not surprising that agreement within the DP is homophonous with “subject markers” because both clausal and DP-internal agreement are controlled by the head noun (the head noun of the grammatical subject and the head noun of the DP in which internal agreement takes place). I argued that the agreement within DP can be understood in light of the analysis of Bantu DPs proposed in Carstens (1993, 1997) in which the head noun (or [N_e] in locative phrases) undergoes movement to # and D⁰ for feature checking. It is in the course of these movements that the

agreement features of adjectives, demonstratives and quantifiers are licensed when N checks its own features.

6. Conclusion

This paper has argued that the controversial phenomenon usually analyzed as either “subject markers” or resumptive/incorporated pronouns is nothing other than agreement morphology. The paper has provided a unified analysis of both clausal agreement and DP-internal agreement by proposing that both types of agreement express a relation between the head noun of a subject XP and its predicate or the head noun of DP and its modifiers. Further, the paper has proposed that both clausal and DP-internal agreement are licensed in a spec-head configuration following movement of either the DP functioning as a subject of a sentence or movement of the head noun within DP. The paper has argued that the fact that the morphological form of the so called “subject markers” changes in response to changes in syntactic phenomena (such as mood and negation) is evidence that they are agreement morphology and not incorporated pronouns, because this kind of behavior is characteristic of agreement morphology rather than resumptive/incorporated pronouns. Agreement in expletive constructions has proved to be a problem for the analysis proposed in this paper. This is especially the case if the realization of agreement is not just a spec-head configuration but is also instantiated as a result of movement. I leave this issue open for future research.

REFERENCES

- Alexiadou, Artemis & Elena Anagnostopoulou. 1998. “Parametrizing Agr: word order, V-movement and EPP-checking”. *Natural Language and Linguistic Theory* 16: 491-539.
- Baker, Mark. 1996. *The Polysynthesis Parameter*. New York: Oxford University Press.
- Baker, Mark. 2002. “Agreement, dislocation, and partial configurationality”. Ms., Rutgers University.

- Binkert, Peter. 1989. "Syntax, short term memory and parsing". Paper presented at the meeting of the Linguistic Society of America. Washington, D.C.
- Bresnan, Joan. 1994. "Locative inversion and the architecture of Universal Grammar". *Language* 70: 72-131.
- Bresnan, Joan & Sam Mchombo 1987. "Topic, pronoun and agreement in Chichewa". *Language* 63: 741-82.
- Bresnan, Joan & Jonni M. Kanerva. 1989. "Locative inversion in Chichewa: A case study of factorization in grammar". *Linguistic Inquiry* 20: 1-50.
- Bošković, Željko. 1997. *The Syntax of Nonfinite Complementation: An Economy Approach*. Cambridge, MA: MIT Press.
- Carstens, Vicki. 1991. *The Syntax and Morphology of Determiner Phrases in Kiswahili*. Los Angeles: University of California, Ph. D dissertation.
- Carstens, Vicki. 1993. "On nominal morphology and DP structure". *Theoretical Aspects of Bantu Grammar*, ed. by Sam Mchombo. Stanford: CLSI. Pp. 151-180.
- Carstens, Vicki. 1997. "Empty nouns in Bantu locatives". *The Linguistic Review* 14: 361-410.
- Chomsky, Noam. 1977. On WH-Movement. *Formal Syntax*, ed. by Peter Culicover, Thomas Wasow & Adrian Akmajian. New York: Academic Press. Pp 71-132.
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2001. "Beyond explanatory adequacy." *MIT Occasional Papers in Linguistics* 20: 1-28.
- Crystal, David. 1991. *A Dictionary of Linguistics and Phonetics* (3rd ed.). Cambridge, Mass.: Blackwell.

- Deen, Ud Kamil. 2004. "Subject agreement versus subject pronoun". Paper presented at the 35th ACAL meeting, Harvard University, Boston.
- Demuth, Katherine & Carolyn Harford. 1999. "Verb raising and subject inversion in comparative Bantu". *Journal of African Languages and Linguistics*, 20: 41-61.
- Demuth, Katherine. 1990. "Locatives, impersonals and expletives in Sesotho". *The Linguistic Review* 7: 233-249.
- Eze, Ejike. 1995. "The forgotten null subject of Igbo". *Theoretical Approaches to African Linguistics*, ed. by Akinbiyi Akinlabi. Trenton, New Jersey: Africa World Press. Pp. 59-81.
- Givón, Talmy 1976. "Topic, pronoun and grammatical agreement". *Subject and Topic*, ed. by Charles Li. New York: Academic Press. Pp. 149-88.
- Guthrie, Malcom. 1967-71. *Comparative Bantu*. Vol 1-4. Farnborough Heights: Gregg International Publishers.
- Jelinek, Eloise. 1984. "Empty categories, case and configurationality". *Natural Language and Linguistic Theory* 2: 39-76.
- Kayne, Richard. 1994. "Romance clitics, verb movement and PRO". *Linguistic Inquiry* 22: 647-686.
- Keach, Camilla N. 1995. "Subject and object markers as agreement and pronoun incorporation". *Theoretical Approaches to African Linguistics*, ed. by Akinbiyi Akinlabi. Trenton, New Jersey: Africa World Press. Pp. 109-116.
- Kinyalolo, Kasangati. 1991. *Syntactic Dependencies and the Spec-head Agreement Hypothesis in KiLega*. Los Angeles: University of California, Ph. D. dissertation.
- Koopman, Hilda & Dominique Sportiche 1991. "The position of subjects". *Lingua* 85: 211-258.

- Machobane, Malillo. 1994. "The Sesotho locative constructions". Unpublished manuscript, The National University of Lesotho.
- May, Robert. 1985. *Logical Form: Its Structure and Derivation*. Cambridge: MIT Press.
- Mathangwane, Joyce. 1999. *Ikalanga Phonetics and Phonology: A Synchronic and Diachronic Study*. Stanford: CSLI Publications.
- Omar, Alwiya S. 1990. "Grammatical and anaphoric relations in Kiswahili: functions of the subject and object prefixes". MS, Indiana University.
- Pires, Acrisio. 2002. "Cue-based change: inflection and subjects in the history of Portugese infinitives". *Syntactic Effects of Morphological Change*, ed. by David W. Lightfoot. New York: Oxford University Press. Pp. 143-159.
- Wasike, Aggrey. to appear. "On the lack of negative imperatives in Bukusu". *Linguistic Analysis* 32: 3-4
- Woolford, Ellen. 1999. "Animacy hierarchy effects on object agreement". *Trends in African Linguistics 3: New Dimensions in African Linguistics and Languages*, ed. by Paul F.A. Kotey. Trenton New Jersey: Africa World Press. Pp. 203-216.
- Zwart, Jan-Wouter. 1997. "Rethinking subject agreement in Swahili". At: <http://www.let.rug.nl/~zwart/docs/nels97.pdf>.
- Zwicky, Arnold & Geoffrey Pullum. 1983. "Cliticization vs inflection: English *n't*". *Language* 59: 502-513.

PUBLICATIONS RECEIVED

Bodomo, Adams. *A Dagaare — Cantonese — English Lexicon for Lexicographical Field Research Training*. (Afrikawissenschaftliche Lehrbücher, vol. 14). Cologne: Rüdiger Köppe Verlag. 2004. Pp. 194. ISBN 3-89645-009-3. Paperback. €34.80.

This volume presents a brief structural sketch of the Gur language Dagaare, followed by a Dagaare — Cantonese — English lexicon. It is intended to be used as a training tool and a reference source in linguistic field methods training of Cantonese- and English-speaking students, in a class focusing on Dagaare or a similar language. The introduction [7-32] provides information on the genetic position of Dagaare, gives the orthography, and then outlines the morphology of the language. The bulk of the volume [33-136] is made up of over 1,200 Dagaare headwords (these include tone markings, which are not part of the standard orthography), followed by a gloss in Cantonese (both romanized and in Chinese characters), and then an English gloss. The Dagaare headwords include paradigmatically related forms such as noun plurals. Chapter 3 "Some time and number systems of Dagaare" [137-143] illustrates the structure of numbers by presenting time of day, days of the week, months of the year, and counting. Sample fieldwork projects are given [144-147], followed by a bibliography of Dagaare, African linguistics and Cantonese, and the book ends with indices of Cantonese words [153-174] and English words [175-194].

Jungraithmayr, Hermann, Wilhelm J. G. Möhlig & Anne Storch. *Lehrbuch der Hausa-Sprache. Grundkurs in 30 Lektionen*. (Afrikawissenschaftliche Lehrbücher, vol. 13). Cologne: Rüdiger Köppe Verlag. 2003. Pp. 335; 3 maps, various illustrations. ISBN 3-89645-006-9. Paperback. €34.80.

This book provides an introductory German language course on Hausa, and is based on the 1976 textbook *Einführung in die Hausa-Sprache* by the first two authors. The introduction [21-61] presents geographical and cultural background on the language, bibliographic references on Hausa and Chadic, and sketches the sound system. The 30 lessons that follow [65-254] each contain three parts. Part A consists of dialogue or other text material of approximately a half page, usually with German translation. Part B presents grammatical topics such as gender, noun pluralization, the various verbal stems, and auxiliaries. Part C gives exercises and texts to translate. The appendix contains paradigmatic tables of verb forms and pronouns, and a Hausa-

German, German-Hausa vocabulary of around 1,700 words, covering all of the Hausa words used in the preceding chapters. There is also an accompanying CD, which will especially facilitate learning the tone system.

Reintges, Chris H. *Coptic Egyptian (Sahidic Dialect). A Learner's Grammar*. (Afrikawissenschaftliche Lehrbücher, vol. 15). Cologne: Rüdiger Köppe Verlag. 2004. Pp. xxiii, 616; 69 tables, 35 figures. ISBN 3-89645-570-2. Paperback. €64.00

The main dialect of Coptic Egyptian, the Sahidic dialect, is described in this combined teaching and reference grammar. Following the introduction [1-11] which presents the classification and history of Coptic, and discusses the theoretical background, data sources and research methods, the grammar is presented in 12 units. "Sounds and spelling" [13-49] explains Coptic orthography, and introduces some simple phonological rules and the spelling of Greek loanwords. "Nouns and pronouns" [51-84] presents noun gender and number, and especially delves into the determiner system with its range of phonological variants and complex semantic properties. This unit also covers numerals and pronouns. "Phrase structure" [85-128] presents NP and PP syntax, including compounds, adjectives, possessive phrases and coordination, and "Deixis, interrogation, quantification" [129-169] looks at the syntax of demonstratives, question words and quantificationals. "Nominal sentences" [171-199] completes the presentation of nominal structures with verbless copular sentences, and covers a considerable range of semantic relations which are expressed by juxtaposition of nominals.

There being over twenty tense, aspect and mood categories in Coptic, in the words of the author the second part of the book, units 6-9, "constitutes the core of the book". The unit "Verbal morphology" [201-243] presents root-and-pattern stem morphology such as the relationship between *kot* 'to build' ~ *kit* 'to be in a built state' as well as the morphophonemic complications of weak and strong verbs. The unit "Absolute tenses" [245-288] presents those tense inflections where the deictic center is defined as the present moment. These are realized in two classes, the "first" and "second" tenses which are distinguished in terms of their syntactic and pragmatic conditions (including, for example, types of focus). Tenses conveying temporal relations such as "until", "after", "if" and "while" are explained in unit 8 "Relative tenses and moods" [289-336]. "Modes of negation" [337-368] completes the presentation of verbal inflections by giving the negative inflections and discussing the issue of scope of negation. The last three units deal with higher-level clause structure. "Word order" [369-409] explains the different word orders of the language, especially their relation to information structure based on basic SVO order subject to various movements. "Relative constructions" [411-457] lays out the structure of relative clauses and the related nominal cleft constructions. The final unit "Subordinate clauses" [459-539] covers the structure of subject and object complement clauses, switch reference, reported speech, conditionals and "after" clauses, as well as other types of sentential complements. These units are followed by a two-page inflectional paradigm of tense-aspect-mood markers, glosses of native Coptic words [543-569] and of Greek loans [570-585], followed by a glossary of linguistic terms, and bibliography.

UPCOMING MEETINGS ON AFRICAN LANGUAGES / LINGUISTICS

2005

March 31-April 3

ANNUAL CONFERENCE ON AFRICAN LINGUISTICS, 36TH. Georgia Southern University, Savannah.
(Conference website: <http://ceps.georgiasouthern.edu/conted/acal.html>). Abstract deadline: December 3, 2004.

July 6-8

LINGUISTICS SOCIETY OF SOUTHERN AFRICA, 2005. Pretoria, South Africa. (Contact: Prof. Adelia Carstens: adelia.carstens@up.ac.za). Abstract deadline: April 4, 2004.

August 29-31

35TH COLLOQUIUM ON AFRICAN LANGUAGES AND LINGUISTICS. Leiden, The Netherlands.
(Contact: call@let.leidenuniv.nl).

Oct 6-8

INTERNATIONAL CONFERENCE ON FOCUS IN AFRICAN LANGUAGES. ZAS, Berlin, Germany.
Contact: Focus in African Languages, ZAS, Jaegerstrasse 10-11, D-10117, Berlin, Germany; email fial05@zas.gwz-berlin.de. 1-page abstract submission deadline April 3, 2005.

Oct 9

INFORMATION STRUCTURE IN BANTU LANGUAGES. ZAS, Berlin, Germany. (co-organized with the London-Leiden-Berlin Bantu Grammar network). Contact: email lutz@soas.ac.uk, website http://mercury.soas.ac.uk/users/lm5/bantu_project.htm

Oct 12-14

CONFERENCE ON GUR LANGUAGES. University of Bayreuth, Germany. Theme: "Current questions in Gur Language Research: Between Tone and Text". Contact: conference webpage <http://www.uni-bayreuth.de/departments/afrikanistik/tagu/gurcon1.html>, email to manfred.vonroncador@uni-bayreuth.de

2006

July 10-12

WORLD CONGRESS ON AFRICAN LINGUISTICS, 5TH. Addis Ababa University, Addis Ababa, Ethiopia. Abstract acceptance dates: July 10-Dec 10, 2005. 1 page 12 pt. abstract as PDF or postscript attachment emailed to afriling@dling.aau.edu.et) or Word document on 3.5 in. floppy mailed to WOCAL 5, Department of Linguistics, Addis Ababa University, P.O.Box 1176, Addis Ababa, Ethiopia.

