VOWEL HARMONY IN SEKPELE

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The paper discusses vowel harmony in Sekpele (Lipke). It demonstrates that the language has regressive assimilation controlled by the first vowel in word stems. Sekpele has both ATR harmony and height harmony.The height harmony involves a stepwise rise in height triggered by the [+high, +ATR] vowels or the schwa in the stem. ATR harmony precedes height in application. The paper departs from previous studies and suggests that Sekpele has a 10 rather than an 8 vowel system.

Cet article traite de l'harmonie vocalique en sekpele (lipke). C'est la première voyelle du radical dans le mot qui contrôle l'assimilation régressive. La langue sekpele contient aussi bien l'harmonie ATR que l'harmonie de hauteur. L'harmonie de hauteur consiste en une élévation par étapes de la hauteur provoquée par les traits [+haut, +ATR] des voyelles ou du schwa dans le radical. L'harmonie ATR précède l'harmonie de hauteur dans son application. L'article se démarque des études précédentes en ce sens qu'elle suggère que le sekpele a un système vocalique de 10 voyelles au lieu de 8.

0. INTRODUCTION

Sekpele is a language spoken by the people of the Likpe traditional area along the Akwapim Range close to the Ghana-Togo border. The language is spoken primarily by ten Likpe communities north-east of Hohoe (the district capital which is an Ewe community). There are two main roads that lead to the various towns from Hohoe; one leads to Nkwanta, Bakwa, Mate, Bala, Todome, and the other leads to Abrani, Koforidua, Agbozume, Avedzime and Kukurantumi via Lolobi-Kumasi.

The aim of this paper is to identify and discuss the vowel harmony system of Sekpele. The paper will first review the vowel inventory of Sekpele. Sekpele is said to have 8 vowels and a cross-height ATR harmony. Working with the proposed 8 oral vowels system makes vowel harmony very difficult to analyze. One problem that I faced was the fact that the high vowels /**u**/ and /**i**/ do trigger both [±ATR^{i}] vowels in the prefix. After several months of deliberations, I decided to expand the scope of the vowels beyond the 8 vowels system by trying to observe the existence of the high[-ATR] vowels. Taking clues from Ameka (2002) (cf. Ford 1973), it can be show that historically, there was a ten vowel system where the [+High,-ATR] vowels were lost leading to different mergers. Not disputing the fact that languages are dynamic, I argue and demonstrate that these vowels have actually not gotten lost but could be found in some Sekpele words given in the next section especially when uttered in colloquial speech.

1. SEKPELE VOWELS (REVISED)

Earlier researchers such as Heine (1968), Ring et al (2002) and Ring (2003) had proposed an 8 oral vowel system for Sekpele. This includes /**i**/, /**u**/, /**e**/, /**o**/, /**ɛ**/, /**ɔ**/, /**ə**/ and /**a**/ found in the following examples.

(1)

/**i**/		/**u**/	
[**sìté**]	'clay'	[**sìtù**]	'metal'
[**ùtìdì**]	'person'	[**kùkùò**]	'book'
[**dìkplibi**]	'pot'	[**ùtùpi**]	'well'
/**e**/		/**o**/	
[**kèè**]	'night'	[**òklòtia**]	'banana'
[**lèbà**]	'rock'	[**kàjó**]	'debt'
[**ǹtè**]	'wine'	[**òkpó**]	'toilet'

/ɛ/		/ɔ/	
[ðkwɛ́]	'farm'	[kàsɔ̂]	'earth/floor'
[ðkpɛ́]	'bowl'	[ðkɔ́]	'cough'
[kɛ̀kɛ̀]	'little'	[ðsɔ̀nɔ̀]	'concubine'
/a/		/ə/	
[àtábí]	'money'	[bə́]	'come'
[ɔ̀klà]	'mat'	[simuə]	'neck'
[kàfiá]	'cloth'	[simə̀]	'smile'

However, based on the assertion of Ford (1973) and my findings from the field, the [-ATR] high vowels /ɪ/ and /ʊ/ seem to exist in the language increasing the tally to 10 vowels. They are acoustically present in words that contain them such as the examples below:

(2)

/ɪ/		/ʊ/	
[sɛ̀fɪ̂]	'finger nail'	[ðpʊ̀nʊ̀]	'table'
[ðsɪ̂]	'witch'	[ðkwɛ́] (ðkʊɛ́)	'farm'
[kɔ̀nɪ̂]	'arm'	[kʊ̀kpɛ̀nsɛ́]	'famine'
[ðjɪ̀mɪ̀]	'sibling'	[ðfʊ́ɛ́]	'snail'
[lɛnímɪ̀]	'finger'	[kàkwɛ́] (kàkʊɛ́)	'spider'
[ðsínɔ́]	'mosquito'	[lɛ̀bʊ́lá]	'onion'
[lɛ̀jɪ̂]	'tooth'	[kàsʊ́ɛ̀]	'squrriel'
[dísɪ̀]	'head'	[lɛ̀hʊ́nʊ́mí]	'sand'
[kɔ̀tɪ̀nɪ̀]	'mountain'	[kàhʊ̀nsíɛ̀]	'world'
[ɔ́kpɪ̀]	'grasscutter'	[kʊ̀mɛ̀nɛ̀]	'madness'

I had an option to treat these vowels as variants of their [+ATR] counterpart but chose to rather treat them as separate phonemes due to the notion of their perceptibility and the fact that they are the triggers of harmony. Details of how harmony is achieved with these vowels will be discussed later. There is also evidence of a near-minimal pair contrast as in example 3 below:

(3) [tʃúɛ́] 'arrange'
[tʃʊ́ɛ́] 'construct'

Figure 1 below provides a modified version of the vowel inventory of Sekpele.

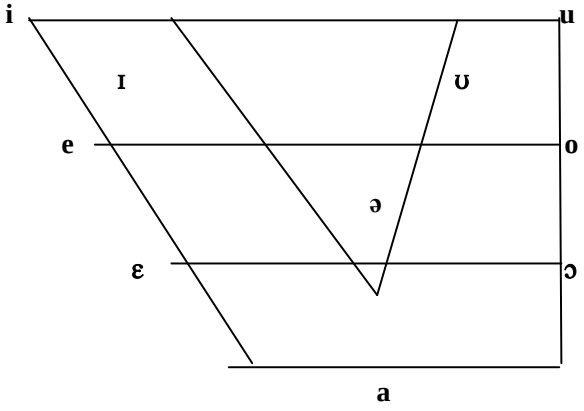


Figure 1 Vowel inventory of Sekpele

These vowels can be grouped symmetrically into two sets for ATR apart from the low vowel [**a**] and the schwa vowel [**ə**];

SET I (+ATR)		SET II (-ATR)	
-back	+back	-back	+back
i	**u**	**ɪ**	**ʊ**
e	**o**	**ɛ**	**ɔ**

The back vowels are all rounded while their front counterparts are unrounded. The central vowels /**a**/ and /**ə**/ are also unrounded. /**a**/ does not partake in ATR harmony probably because it has no counterpart. However, /**ə**/ may be seen as just a good trigger of height harmony as the high [+ATR] vowels are. This will be shown later when addressing vowel harmony. It is not clear how many nasal vowels there are in Sekpele, however vowels co-occurring with nasal consonants in the rime are nasalized. There are also evidences that, in colloquial speech, nasal consonants may be deleted whilst the nasal feature spreads to an adjacent vowel. There is evidence of underlying nasal vowels in Example 4 below:

(4) [**wã**] 'cook'
[**lé-kpã**] 'bat'
[**lè-wɔ̃**] 'nose'
[**di-wə̃**] 'hoe'

2. VOWEL HARMONY

Vowel harmony is a phonological process that occurs between adjacent vowels in a word or in a morpho-syntactic domain. Vowel harmony is a type of long-distance assimilatory phonological process involving vowels such that adjacent vowels tend to share some phonetic features. Vowel harmony, according to Goldsmith (1990:304) is a term used to describe a restriction on the set of vowels possible within a given phonological domain, typically words. A vowel harmony system is one in which the vowels of a language are divided into two or more or even overlapping subsets, with the condition that all vowels in a given word or domain must come from a single set. Katamba (1989) also states that vowel harmony is a process whereby within a certain designated domain, usually the word, all or some vowels are required to share one or more phonological properties. The vowels may assimilate in phonetic features such as backness, height, ATR or roundness.

Sekpele is a language that exemplifies vowel harmony in all spheres of linguistic representation. Vowel harmony is realized in lexical and morpho-syntactic domains. The morphological structure of Sekpele is agglutinative with some fusion. The language employs both prefixes and suffixes. Sekpele displays anticipatory ATR harmony between roots and prefixes. There is also a step-wise rising height harmony triggered by the High [+ATR] vowels and the schwa (**ə**).

In general, the direction of harmonic assimilation may be either progressive or regressive. A progressive harmony proceeds from a segment in a forward direction to the other while that of a regressive harmony goes the other way. Languages with prefixes have regressive harmony whereas those with suffixes have progressive harmony in cases where the languages are said to be root-controlled. Some languages that have both prefixes and suffixes may have both progressive and regressive harmonies. There are other languages that have affixes controlling harmony and this kind of harmonic process is referred to as dominant harmony. Assimilatory processes

relating to vowel harmony in Sekpele are regressive therefore operate in the domain of stems and their prefixes. Suffixes in Sekpele are not affected by vowel harmony.

There are several vowel harmony types often involving dimensions such as vowel height, backness, roundness, ATR and nasalization, and they may run through an entire word. However, vowel harmony in Sekpele is limited to the ATR and height feature of correspondent vowels, and it is obligatory between the first vowel of the stem and the prefix. Both the prefix and stem vowels play their respective role in both ATR and height harmony. The first stem vowel closest to the prefix controls harmony, such that it spreads its corresponding feature to the prefix vowel. The other vowels following the initial stem vowel in a multi-syllabic word do not have any influence whatsoever with the prefix vowel. However vowels of diphthongs vary in their control of harmony depending on their strength and precedence - the stronger the vowel, the greater the control. When both vowels have equal strength then precedence determines the control.

In general, the stem vowel can be any of the ten vowels, but the prefix vowel is restricted to the alternation of [**a**, **e**, **ə**] if it is a [-back, -high] vowel, [**e**, **ɛ**, **i**] if it is a [-back, -low] vowel and [**u**, **o**, **ɔ**] if it is a back vowel. Their resolution is depending on the vowel quality of the stem vowel. This generalization is taken from Table 1 below which is an extract of consistence data and it shows stem vowels and their corresponding prefix vowels.

[-back,-high] prefix vowel	[-back,-low] prefix vowel	[+back] prefix vowel	stem vowel
e	**i**	**u**	**i**
a	**ɛ**	**ɔ**	**ɪ**
a	**e**	**o**	**e**
a	**ɛ**	**ɔ**	**ɛ**
a	**e**	**o**	**a**
ə	**i**	**u**	**ə**
a	**ɛ**	**ɔ**	**ɔ**
a	**e**	**o**	**o**
a	**ɛ**	**ɔ**	**ʊ**
e	**i**	**u**	**u**

Table 1 Stem and prefix vowels

In the first row of the table above, we can observe if the stem vowel is /**i**/, then it will take [**u**] as its prefix if the prefix vowel is a [+back] vowel; [**i**] if the prefix vowel is a [-back,-low] vowel and [**e**] if the prefix vowel is a [-back, -low] vowel. The same procedure applies to the vowels in the other rows.

2.1 ATR HARMONY

A language is said to employ ATR harmony if adjacent vowels in a lexical or morphological domain share the same ATR feature. In Sekpele, ATR harmony operates on the following conditions: In the case where the prefix vowel is a [+back] vowel, then it is underlyingly underspecified as [-high, -low]. The ATR feature of the first stem vowel determines the surface form of the prefix vowel such that in a situation where the stem vowel is [+ATR], then the prefix stem will surface as [**o**-]. On the other hand, when the stem vowel is [-ATR], the prefix vowel surfaces as [ɔ-]. However, if the prefixed vowel is a [-back] vowel, then it takes two height levels into consideration in determining the underlying form. This could be specified as [-high, +low] or underspecified as [-high, -low] which may surface as [**a**-] in the former and either [**e**-] or [ɛ-] in the later depending on the ATR feature of the stem, so far as the stem vowel is not a [+high,+ATR] vowel or the schwa.

(5) **kò-tó**
SG.NCL2-ear
an ear

(6) **ò-klótɪa**
SG.NCL4-banana
a banana

(7) **ò-tê**
SG.NCL1-goat
a goat

(8) **ɔ̀-púnú**
SG.NCL4-table
a table

(9) **ɔ̀-kpɛ́**
SG.NCL4-bowl
a bowl

(10) **ò-sànî**
SG.NCL1-man
a man

(11) **à-tó**
PL.NCL2-ear
ears

(12) **kà-kplótɪa**
PL.NCL4-banana
bananas

(13) **bà-tê**
PL.NCL1-goat
goats

(14) **kà-púnú**
PL.NCL4-table
tables

(15) **sè-bó**
SG.NCL6-towel
towel

(16) **sè-bɛ́**
SG.NCL6-palm kernel
palm kernel

The above data is a replica of the noun class system of Sekpele. The class to which a noun stem belongs is indicated by a prefix. Although the language has about nine nominal classes, I have outlined a few to analyze the general vowel harmony patterns for the sake of this study. In examples (5), (6) and (7) we can observe that as a result of the prefix vowel being a [+back] vowel and the stem vowel being a [+ATR] vowel, the surface vowel of the prefix become [**o**-]. However we can observe a diverse situation when the stem vowel is a [-ATR] vowel as in examples (8) and (9), the surface vowel of the prefix becomes [**ɔ**-]. In example (10), the prefix vowel surfaces as [**o**-] as it co-occurs with the low vowel. There are a few possibilities that may account for this trend. One such possibility is that the low vowel may be opaque and unspecified for ATR such that its influence on the prefix vowel is minimal. Another possibility that may add up to the previous one is that, the prefix vowel may be

underlyingly a [+ATR] vowel and since the low vowel is neutral in its influence, it surfaces as [**o**-].

In the other case where the prefix vowel is a [-back, +low] vowel, then it is specified as low and surfaces as [a-] as in the examples (11), (12), (13), and (14), so far as the stem vowel is not [**i**], [**u**], or [**ə**]. The data above does not include the vowels [**i**, **u**, **ə**] because they are exceptions and they will be treated in my discussion on height harmony. The resolution of the low vowel is possible due to the fact that it has no counterpart so far as ATR is concerned therefore it chooses to co-occur with both [±ATR] vowels. Furthermore, in examples (15) and (16), the prefix vowels are alternates and have the features [-back, -low]. The prefix vowel surfaces as [**e**] or [**ɛ**] when it co-occurs with a stem vowel with [+ATR] and [-ATR] respectively.

Another area that Sekpele employs vowel harmony is in the tense and aspect of verbs. This can be observed in the following examples.

(17) **bó-té**
1PL.PST-sell
we sold.

(18) **bó-tò**
1PL.PST-build
we built

(19) **bɔ́-tɔ̀**
1PL.PST-ask
we asked

(20) **bɔ́-tɛ́**
1PL.PST-allow
we allowed

(21) **á-té**
2SG.PST-sell
you sold

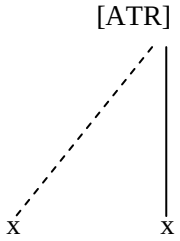
(22) **á-tò**
2SG.PST-build
you built

(23) **á-tɔ̀**
2SG.PST-ask
you asked'

(24) **á-tɛ́**
2SG.PST-allow
you allowed

From the above, we can observe that examples (17) to (20) contain prefixes having a [+back] vowel. In (17) and (18), the prefix vowel surfaces as [**o**-] because the stem vowel is [+ATR] while in (19) and (20), it surfaces as [**ɔ**-] due to the fact that the stem vowel is a [-ATR] vowel. We can also observe that in examples (21) to (24), the prefix vowel surfaces as [**a**-] because it is a [-back,-high] vowel and the stem vowel is not a [+ATR, +high] vowel or the schwa.

The discussion above can be represented with the autosegmental structure below:



2.2 HEIGHT HARMONY

The height harmony in Sekpele involves a stepwise rise in height triggered by the [+high, +ATR] vowels or the schwa (**ə**) in the stem. In my earlier discussion, I stated that the prefix vowel is restricted to the alternation of [**a**, **e**, **ə**] if it is a [-back, -high] vowel, [**e**, **ɛ**, **i**] if it is a [-back, -low] vowel and [**u**, **o**, **ɔ**] if it is a back vowel and that their resolution depends on the vowel quality of the stem vowel. In my discussion

on ATR harmony, I also postulated that prefix vowel is underlyingly underspecified as [-high, -low] if it is a [+back] vowel; specified as [-high, +low] or underspecified as [-high, -low] if it a [-back] vowel. On this note, given that the stem vowel is either a [+high, +ATR] vowel or a schwa, then the prefix vowel will surface as [**u**], [**e**] and [**i**] respectively. In terms of precedence, ATR harmony precedes height harmony. For simplicity and the avoidance of repetition, the following data could be compared with those given on the discussion on ATR harmony.

(25) **ù-kùsɛ**
SG.NCL1-fowl
a fowl

(26) **ù-tídì**
SG.NCL1-human
a human being

(27) **bè-kùsɛ**
PL.NCL1-fowl
fowls

(28) **bè-tídì**
PL.NCL1-human
human beings

(29) **si-tu**
SG.NCL6-metal
metal

(30) **si-nə**
SG.NCL6-meat
meat

We can observe in examples (25) and (26) when compared with (5), (6), and (7) in Section 2.1 that, the prefix vowels are underlyingly a [-high, -low] vowel and they surface as [u] in contexts where the first stem vowel is a [+high, +ATR] vowel. In examples (27) and (28) we can also observe that the prefix vowel when compared with examples 7, 8, 9 and 10 should be a low vowel but surfaces as [**e**] due to its co-occurrence with a [+high, +ATR] vowel in the stem. When we also compare examples (29) and (30) with examples (15) and (16), we realize that the prefix vowel is underlyingly a [-back, -high, -low] vowel, but it is realized as [**i**] as a result of its co-occurrence with a [+high, +ATR] or the schwa.

The stepwise rising is influenced by the tendency for vowels of closer sonority or height levels to co-occur for a smooth transition during utterances. For instance, in Sekpele, a [+high, +ATR] vowel cannot co-occur with the low vowel. Secondly, no vowel can possess the feature combination [+high, +low] therefore the stem vowel has to spread one of its height features such that the output is not [+high, +low]. On this note, if the prefix vowel possesses the feature [-high, -low], then the feature that will trigger a stepwise rise in height is the [+high] feature of the stem vowel. However, if the prefix vowel possesses the feature [-high, +low], then the [-low] feature of the stem will trigger a stepwise rise in height.

The discussion above can be represented with the phrase structure rules and the autosegmental structure below:

[-high, -low] ➞ [+high, -low] / _ [+high, -low]

[-high, +low] ➞ [-high, -low] / _ [+high, -low]

The question may arise as to why the schwa is able to trigger a stepwise rise in height since it is not a high vowel. This is a difficult question to answer; however, if all the vowels in Sekpele are arranged according to the height symmetry as shown below,

then we may find a reason for this trend. The vowels in the first row are the corresponding high vowels of the second row.

i ɪ ə ʊ u

e ɛ a ɔ o

Nevertheless, the [+High,-ATR] vowels does not trigger the stepwise rise in height as we have seen earlier. This is because the height feature is not the sufficient factor but the ATR as well. They do however conform to ATR harmony as in the examples below.

(31) **ɔ̀-pónó**
SG.NCL-table
a table

(32) **ɔ̀-sìnɔ́**
SG.NCL-mosquito
a mosquito

3. CONCLUSION

There are two kinds of vowel harmony processes in Sekpele: ATR and height harmony. The vowel harmony process occurs between stems and their prefixes such that they share the same ATR features and a stem may trigger a stepwise rise in height if its initial syllable vowel is a high [+ATR] vowel or a schwa. The vowel harmony process is possible due to the fact that Sekpele has ten vowels; eight of the vowels constitute ATR symmetry. The low vowel /**a**/ is opaque and does not partake in ATR harmony probably because it has no counterpart. Although the high [-ATR] vowels are high on the height symmetry, they do not trigger height harmony. This is because height is not the only prerequisite for triggering the stepwise rise in height but the ATR as well. However, the schwa is a trigger of height harmony although it is not a high vowel.

ABBREVIATIONS

ATR	Advanced Tongue Root	NCL	Noun Class Prefix
SG	Singular	PST	Past
PL	Plural		

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