

Vowel harmony in Etulo: A preliminary investigation

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Abstract

The paper is a preliminary investigation of vowel harmony in Etulo, a minority language spoken in central Nigeria. The Etulo language belongs to the Idomoid group of the New Benue Congo language family. The researchers' contact with the Etulo people exposed us to the need to examine the vowels of Etulo and their combinatory possibilities in the words of the language. This is principally with a view to finding out if there is vowel harmony in Etulo, and if there is, to ascertain the phonetic feature on which the harmony hinges and the permitted combinations of the vowels in words and across morpheme boundaries. The data for this study were elicited from the native speakers of the Etulo language resident in Adi, Buruku Local Government Area of Benue State, Nigeria using a modified Roger Blench's 1000 wordlist. The data were transcribed based on the International Phonetic Alphabet (IPA). The findings reveal that there is vowel harmony in Etulo. The study shows that the language operates [ATR] vowel harmony. From our investigations, Etulo has seven phonemic vowels /i e ε a ɔ o u/ which comprise four [+ATR] vowels /i e o u/ and three [-ATR] vowels /ε a ɔ/. The low vowel /a/ is an opaque vowel and as such neutral to vowel harmony, as it co-occurs with all Etulo vowel phonemes. Furthermore, prefixes of infinitives and gerunds also show evidence of vowel harmony

Introduction

It is commonly observed in phonological systems of languages that a segment often requires a greater similarity to a neighbouring segment with respect to a certain phonetic feature. Instances of phonological patterns exhibiting such requirements for vowels abound in African languages. One of them is vowel harmony - a widespread phonological phenomenon in African languages. Vowel harmony has been generally defined as the process where the vowels of a language divide themselves into two based on certain phonetic feature such that only the vowels of one set can co-occur in the simple words of the language (see Crystal 1997, Mbah and Mbah 2000, Matthew 2007, Eme 2008). Sometimes, vowel harmony extends beyond simple words to touch such forms as pronouns and various affixes, including prefixes, infixes, interfixes and suffixes, depending on the language involved.

This paper attempts to account for vowel harmony in Etulo, a minority language spoken in Benue State of Nigeria. The Etulo language belongs to the Idomoid group of the New Benue Congo or West Benue Congo sub family of the Niger-Congo language family (Ethnologue 2014). The study is a preliminary investigation. The researchers developed interest in this study when we interacted with the speakers of the Etulo language during our visit to their community for a social function. As we listened to their speech, we felt the need to investigate the vowels of their language to find out if there is vowel harmony in Etulo, and if there is, to ascertain the phonetic feature that determines the harmony and the extent of the harmony in terms of the appearance of vowels in the words and affixes of the language. Since our initial search in the literature points to dearth of

materials on vowel harmony in Etulo, we decided to embark on this preliminary investigation. The approach we adopted for the study is purely descriptive, while our data were collected from the speakers of what we shall call the Adi variety of Etulo, that is, the Etulo variety spoken in Adi in Buruku Local Government Area of Benue State of Nigeria. In addition, we used the International Phonetic Alphabet (2005) in representing the perceived sound segments; as the Etulo orthography, we were informed, is still at the developmental stage.

Literature review

Vowel harmony refers to conformity among vowels with respect to a particular feature or property within a word or a smaller domain. Katamba (1989) explains vowel harmony as a process whereby within a designated domain, usually a word, all vowels are required to share one or more phonological properties. For Trask (1996), vowel harmony is a phenomenon occurring in some languages in which only certain combinations of the languages' vowel phonemes are permitted to occur within some specified phonological domain, most usually a single phonological word. The permitted combinations are usually those which agree in respect of one or more phonetic features such as back, round, height and advancement of tongue root (often referred to as [ATR]).

Ladefoged (1993) notes that in languages that have [ATR] vowel harmony system, there are two sets of vowels that differ mainly in the size of the pharynx during their production. In one set, the [+ATR] set, the root of the tongue is drawn forward and the larynx is lowered so that part of the vocal tract in the pharynx is considerably enlarged. In the other set, the [-ATR] set, there is no advancement of the tongue root or lowering of the larynx

instead the tongue root retracts towards the pharyngeal wall. He further claims that the terms tense and lax are sometimes used to describe these differences in vowels whereby the former refers to [+ATR] while the latter refers to [-ATR]. Kramer (2003) avers that the position of the tongue root, with an advanced tongue root [ATR] as in the vowel [o] in opposition to a retracted tongue root [RTR] as in the vowel [ɔ], is the active feature in Niger-Congo languages like Yoruba, Fula and many Nilo-Saharan languages like Pokot, Luo. Following from this, Casali (2008) observes that most African languages exhibit [ATR] vowel harmony, which is based on the size of the pharynx as controlled by the advancement and retraction of the root of the tongue and the raising and lowering of the larynx.

Knowles (2012) observes that languages can exhibit harmony in diverse ways. Following an experiment involving six languages that exhibit varying harmony patterns, Knowles asserts that a mixture of unigrams model is capable of modeling harmony patterns in a way that coincides with the basic knowledge about a language's vowel inventory.

Mahanta (2008), citing Ultan (1973), posits some defining characteristics of vowel harmony as follows:

- i. The triggering element is always a vowel
- ii. The triggering vowel is a root or stem vowel
- iii. The domain of vowel harmony is the phonological or morphological word
- iv. Vowel harmony systematically affects all grammatical classes.

From this we see that not only that the sound segment that can trigger vowel harmony must be a vowel, it is clear that the vowel must be found at the base/stem of a phonological or morphological word. These defining characteristics are evident in Etulo.

For Oyebade (2004), vowel harmony is a process that imposes the euphonic constraint of allowing vowels from a particular group to co-occur in a well-defined domain to the exclusion of members of the other groups. He exemplifies with the Yoruba VCV nouns:

1.	a	b
	owó ‘money’	owó ‘hand’
	òwe ‘proverb’	òsè ‘week’
	edzò ‘snake’	edzò ‘gossip, case’
	ewe ‘leaf’	èdzè ‘blood’

In example 1, the data in group (a) show [+ATR] vowels occurring together in words and those in (b) show the co-occurrence of [-ATR] vowels in words.

Archangeli and Pulleyblank (1989) claim that in Yoruba the ATR spreading applies between stem and prefixes but not between stem and suffixes. They exemplify with the following data:

2. Harmony after nominalizing prefixes

dε	‘hunt’	ɔdε	‘hunter’
rò	‘think’	èrò	‘a thought’
rɔ	‘fabricate’	εrɔ	‘machine’
ta	‘shoot’	ɔta	‘person who is shot’

In 2 the nominalizing prefixes [ɔ e ε ɔ] are in harmony with the vowels of the stem [ε o ɔ a] respectively. The authors further claim that harmony involving prefixes in Yoruba is half testable due to the virtual absence of suffixes in the language. Further investigation of Etulo would reveal whether this phenomenon is identifiable in the Etulo language.

Clements (1984) studies vowel harmony in Akan, and observes that Akan has nine vowels grouped into two sets according to their specifications for the feature [ATR]. He exemplifies as follows:

3. Advanced	Retracted
[ebuɔ] ‘nest’	[ɛbʊɔ] ‘stone’
[okusie] ‘rat’	[ɔkɔdiɛ] ‘eagle’
[esini] ‘piece’	[ɛpɔnʊ] ‘door’

In 3, the vowels in each of the Akan words agree in [ATR] specifications. In the word [ebuɔ] ‘nest’, we notice that the vowels [e u ɔ] are all [+ATR]. We also observe that the word [ɛpɔnʊ] ‘door’ is made up of the vowels [ɛ ʊ] of the [-ATR] set.

According to Bakovic (2000), vowel harmony process can be either stem-controlled or dominant-recessive. In stem-controlled harmony, the harmonic feature values of vowels in the stem determines the feature values of vowels in subsequent affixes while in dominant-recessive harmony, one feature is dominant and the other recessive such that any dominant valued vowel, stem or affix determines the harmonic value of the other vowels within a word. Based on the Etulo data so far collected for this preliminary investigation, we say that vowel harmony process in the language is stem-controlled.

Unseth (2009) studies vowel harmony in Wolof, a Senegambian language of Senegal, and claims that the eight vowel phonemes of the language harmonize based on the [ATR] feature. He gives these examples of vowel harmony in Wolof:

4. a	b
tilim ‘to be dirty’	cεɛ ‘conscious’
jigeen ‘woman’	lɛmpɔ ‘tax’
junqoob ‘crab’	xandɔɔɾ ‘to snore’
fuddən ‘hyena’	maango ‘mango’
xooyəl ‘dilute’	jafɛ ‘expensive’

In 4(a), we have words in which all the vowels are [+ATR], while 4(b) shows the co-occurrence of [-ATR] vowels in words. Thus, the vowels [i e u o ə] are [+ATR] while [ɛ ɔ a] are [-ATR] vowels.

According to Mbah and Mbah (2000), vowel harmony in Igbo is based on pharyngealization. They note that the

pharyngealized vowels co-occur with members of their set while the non pharyngealized ones co-occur with themselves in any simple word of the language. For example:

5.	[-ATR]		[+ATR]
	ɔba	‘barn’	obe ‘cross’
	ɪtari	‘cane’	obere ‘small’
	amuma	‘prophecy’	osisi ‘tree’

In 5, each word under [-ATR] contains exclusively [-ATR] vowels while the words under [+ATR] are made up of [+ATR] vowels only.

For Nwaozuzu (2005), the imperative marker for standard Igbo, the open vowel suffix -E realized as any of [a e ɔ], is conditioned by vowel harmony such that the vowel of the verb root is repeated to form the imperative if it is any of [a e ɔ], i.e. be it [+ATR] or [-ATR]. Her instances of such imperatives are shown below:

	a		b
6.	taa	‘chew’	zoo ‘hide’
	kọọ	‘tell’	loo ‘swallow’
			mee ‘do’

The imperative in 6(a) is formed by repeating the [-ATR] root vowels [a] and [ɔ] while the imperative forms in 6(b) are formed by repeating the [+ATR] root vowels [o e]. Nwaozuzu (2005) also observes that in the Igbo language, the second person and

third person singular pronouns in the subject position are conditioned by vowel harmony rule. She exemplifies as follows:

- 7a. o/i riri ji ‘he/you ate yam’
 b. o/i bere akwa ‘he/you cried’
 c. o/i ruru ɔru ‘he/you worked’
 d. o/i koro ji ‘he/you planted yam’

In 7(a-d), the vowels of the verb roots (i e u ɔ) in riri, bere, ruru, koro respectively, select the pronoun o/i or o/i in consonance with the vowel harmony rule. This explains why the vowels of the verb root and the subject pronouns in 7(a-b) are all [+ATR] vowels. Examples 7(c-d) are made up of [-ATR] vowels (u ɔ) respectively in the verb root, and these vowels also select o/i as subject pronouns.

Kari (2007) avers that the ten vowels of Degema fall into two tongue root categories: advanced tongue root [+ATR] comprising [i e ə o u] and retracted tongue root [-ATR] made up of [ɪ ɛ a ɔʊ]. According to him, within a simple word, all the vowels that belong to a single category occur together, as shown below for [+ATR] and [-ATR] vowels respectively:

- | | | | | |
|----|-------|--------------------|-------|----------------|
| 8. | ɓine | ‘ask/beg’ | kɪjɛ | ‘give’ |
| | ɓune | ‘slit’(something)’ | mɔrɛ | ‘light a fire’ |
| | dɛri | ‘know’ | ɔdɛdɛ | ‘chief’ |
| | kpoti | ‘bring together’ | dɔnɛ | ‘endure’ |

ogədəgə ‘mighty’

ɔkpakırak ‘tough’

Kari’s examples in 8 above clearly show that there is vowel harmony in Degema such that vowels drawn exclusively from the same set occur together in simple words, avoiding a combination of vowels from both sets. For instance, the word ogədəgə ‘mighty’ is composed of the vowels [o ə] that are [+ATR]. On the other hand, kijε ‘give’ is made up of the vowels [iε] of the [-ATR] set.

Etulo vowel harmony

In this section, we examine the phenomenon of vowel harmony as it operates in simple words and across morpheme boundaries in the Etulo language. We adopt the following tone marking convention for representing the four contrastive tones of the language: high tone is unmarked, low tone is marked with a grave accent [`], the down step tone is marked with a macron [¯] and a circumflex [^] is used to mark the falling tone. (For discussion on Etulo tone, see Okoye 2009; Okoye and Osuagwu 2014.)

Below is the vowel inventory of Etulo

[+ATR]			[-ATR]		
Front	Back		Front	Back	
high	i	u	high		
mid	e	o	mid	ε	ɔ
low			low	a	

Etulo [+ATR] harmony

The four [+ATR] vowels of Etulo /i e o u/ co-occur in simple words, attesting vowel harmony in the language. Example 9 shows some simple words of Etulo.

9a.	ètsè	‘tear’
	èwô	‘body’
	ènè	‘fair’
	òpò	‘tent’
b.	égbê	‘day’
	ònwè	‘child’
	ènwè	‘children’
	òfe	‘weed’
	òfè	‘door’
c.	ìgùgù	‘owl’
	ìkùkù	‘insect’
	ìdù	‘market’
	ìtukù	‘heart’
	ìvù	‘forest’
d.	èfi	‘urine’
	ìnènè	‘anus’
	ògbìgbì	‘cock’
	juwô	‘breath’

In 9, the four [+ATR] vowels are seen occurring together in simple words. Examples 9(a, b) show the co-occurrence of the [+ATR] mid vowels [e] and [o] in simple words. In 9(c), the high [+ATR] vowels [i] and [u] occur together in simple words.

By considering only the examples in 9(a, b, c), a casual observer may claim that Etulo operates exclusively height harmony. This is because of the fact that the high vowels /i u/ occur together while the mid vowels /e o/ co-occur as well. However, the examples in 9(d) show that all the four [+ATR] vowels also occur together in simple Etulo words. This points specifically to [ATR] harmony rather than height harmony. Furthermore, there are no instances in our data depicting a co-occurrence of the Etulo mid vowels [ɛ ɔ e o] without reference to [ATR] feature.

[-ATR] harmony in Etulo

Our Etulo data confirm that [-ATR] vowels co-occur across morpheme boundaries within words to the exclusion of [+ATR] vowels. This is seen in 10(a-c):

- 10a. ðkwɔ̂ ‘cough’
 ðnɔ̂ ‘sun’
- b. àdzɛ̂ ‘suffering’
 àwɔ̂ ‘wind’
- c. ɛ̂sɛ̂ ‘earth’
 ɛ̂fɛ̂ ‘speck’
 ɛ̂mɛ̂ ‘bedbug’
- d. ɛ̂kwɔ̂ ‘tree’
 ðmbɛ̂ ‘dew’

Simple Etulo words in 10 (a-d) confirm our earlier claim that there are no instances, at least in our data for now, depicting a co-

occurrence of the Etulo mid vowels [ɛ ɔ e o] without reference to vowel harmony.

Etulo and opaque vowel

There is the existence of an opaque vowel in the vowel harmony system of the Etulo language. This is as expected, since Williamson and Blench (2000) have pointed out that opacity is one of the characteristic features of Kwa languages; to which Etulo belongs, going by Greenberg's (1963) classification of African languages. The opaque vowel of Etulo is the open front unrounded vowel [a]. This vowel is neutral to vowel harmony in the Etulo language, as it is capable of co-occurring with the vowels of both [+ATR] set and [-ATR] set, the fact of its being a phonetically [-ATR] vowel notwithstanding.

We show in 11(a-d) and 12 the co-occurrence of the opaque vowel [a] with [+ATR] vowels and [-ATR] vowels respectively in simple words of Etulo.

11a.	ati	‘snail’
	anĩ	‘I’
	ifà	‘snake’
	ifákwú	‘chameleon’

b.	abe	‘placenta’
	atse	‘comb’
	èkô	‘liver’
	èmâ	‘you’

c.	àdopò	‘heaven’
	àkpogò	‘hip’
	óbân	‘husband’
	òbàgwù	‘monkey’

	òjaa	‘bread’
d.	àkpukpû	‘bone’
	ùzà	‘money’
	ùwà	‘canoe’
	ùtâ	‘bow’
12a.	àdʒÈ	‘suffering’
	àkpɛkɛ̂	‘check’
b.	àdɔ̂	‘ear’
	àwɔ̂	‘wind’
	òndʒâ	‘woman’

In 11, we see the low vowel occurring both at the word initial and word final positions in the Etulo words. For instance in 11(a), we observe that the opaque vowel occupies the initial position in *ati* ‘snail’ and final position in *ifà* ‘snake’. The examples in 11(b) show the co-occurrence of the opaque vowel with the mid front vowel [e]. In 11(c), the mid back vowel [o] occupies the medial and final positions in the words *àdopò* ‘heaven’ and *àkpogò* ‘hip’ while the opaque vowel [a] occupies the initial position in both words. The words in 11(d) are instances of co-occurrence of the opaque vowel and the high back vowel [u]. One observes that in 12(a) the opaque vowel combines with the mid front vowel [ɛ] to yield some Etulo simple words, such as the words for ‘suffering’ àdʒÈ and ‘check’ àkpɛkɛ̂. The opaque vowel is seen in 12(b) co-occurring with the mid back vowel [ɔ] in such Etulo words as àdɔ̂ ‘ear’, òndʒâ ‘woman’.

Vowel harmony and prefixes in Etulo

Our preliminary study of affixation and vowel harmony in Etulo is on prefixation only, as we are yet to investigate other Etulo affixes. Our study reveals that prefixes adhere to vowel harmony. So far, we have investigated the prefixes for the formation of infinitive and gerund.

Infinitive construction

The infinitive in Etulo is formed by prefixation. The affix which is usually the vowel [o] or [ɔ] is attached before the root vowel. In Etulo infinitival construction, the prefix seems to possess an unchanging inherent low tone, and it agrees in harmony with the vowel of the verb root. This is shown in example 13:

	[+ATR]		[-ATR]
13.	òwe ‘to remember’		òné ‘to lick’
	ògje ‘to eat’		òkjɔ ‘to do’
	òfo ‘to hear’		ògbò ‘to count’
	òtso ‘to teach’	òdɔ	‘to boil’
	òto ‘to read’	òkwɔ	‘to cough’
	ògbo ‘to say’	òsɔ	‘to sit’
	òkùkù ‘to crawl’	òlɔ	‘to write’
	òlu ‘to go’		
	òwulu ‘to pain’		

The data in 13 show harmony for the [+ATR] vowels and [-ATR] vowels. The vowel prefix [o] in the [+ATR] set agrees in [ATR] specification with the [+ATR] vowels [e o i u] in the verb root. Also in the [-ATR] set, [ɔ] which is the vowel prefix, agrees with the vowel of the stem. This means that in an infinitive, if the root vowel is [+ATR], it selects the vowel [o] as the prefix. On the other hand, if the root vowel belongs to the [-ATR] set, [ɔ] becomes the appropriate prefix, in line with vowel harmony.

Gerund formation

Vowel harmony in Etulo also operates in the formation of gerund, as the vowels in the root agree in [ATR] specification with the vowel prefix. This is exemplified in 14 below:

14a.	ɔ̄gbɔ̄gbɔ̄	‘counting’
	ɔ̄dɔ̄dɔ̄	‘boiling’
	ɔ̄lɔ̄lɔ̄	‘writing’
	ɔ̄nɛnɛ	‘licking’
b.	ɔ̄wɔ̄ewē	‘remembering’
	ɔ̄wuluwulū	‘paining’
	ɔ̄didi	‘seeing’
	ɔ̄lululū	‘going’
	ɔ̄tɔ̄toō	‘digging’
	ɔ̄tsɔ̄tsó	‘teaching’

In 14, the vowel prefix [ɔ] or [o], which seems to be consistently on low tone, agrees in [ATR] specification with the vowel of the reduplicated stem. For instance, in 14(a) the [-ATR] vowel prefix [ɔ] harmonizes with the vowels of the root [ɔ ɛ] while in 14(b)

the vowel prefix [o] and the vowels of the stem [o e u i] belong to the [+ATR] set.

Summary and conclusion

The findings of our preliminary investigation of vowel harmony in Etulo reveal that there is vowel harmony in the language. The study shows that in Etulo, the phenomenon of vowel harmony divides the vowels of the language into two asymmetrical sets of [ATR] harmony: four [+ATR] vowels [i e o u] and three [-ATR] vowels [ɛ ɔ a]. Therefore, the [+ATR] vowels and the [-ATR] vowels are involved in harmony in the simple words of the Etulo language. We also discovered that harmony in the Etulo language extends beyond morpheme boundaries within words. Affixes such as for infinitive and gerund are conditioned by vowel harmony, the appropriate form being selected based on the [ATR] feature of the vowel of the verb root. For instance, the infinitive in Etulo is formed by the prefixation of, usually, [o] or [ɔ] to the verb root. The vowel with the same [ATR] specification with the vowels of the root is prefixed. The gerund, formed by prefixation and root reduplication, has the prefix being either [o] or [ɔ] in accordance with vowel harmony. The low vowel [a] is an opaque vowel in the language; being neutral to vowel harmony, it co-occurs with all the vowels of the Etulo language.

This study calls for further research into not only the vowels of Etulo but also their other linguistic features as we have observed, for instance, that the prefix [o ɔ] for marking infinitive and gerund in the language seems to have an inherent low tone which it consistently retains in these constructions. There is also the need to confirm, or otherwise, that Etulo vowel harmony is stem-dominant. Whether there is harmony spreading between

stem vowel and prefix as well as suffix should be looked into. We suggest research should help to give more insight into the behaviour of Etulo vowels and account for vowel harmony in the language using any of the competing theoretical models.

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