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SEGMENTAL ASSIMILATION PROCESSES IN ÈWÙLÙ

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Abstract:
Segmental assimilation processes are phonological patterns that involve the adoption of a feature(s) by one segment from another thereby making the two assume total or partial structural identity. The objective of this study is two folds: (1) to use existing Èwùlù data to examine a number of segmental assimilation processes: vowel nasalisation, vowel (dis)harmony, homorganic nasal assimilation and vowel assimilation deployed to modify sound segments in local contexts in native phonology of Èwùlù (Igboid: Delta State, Nigeria). (2) To provide further insight into some recurrent natural feature spreading phonological phenomena found in Benue Congo languages of Nigeria from a dialectal perspective. Since assimilation processes/rules are characterised as association or spread of feature(s) of one segment A to a neighbouring segment B following the theoretical assumptions of phonologists of the Post-SPE era, the framework adopted in this work is autosegmental theory (Goldsmith, 1976). In the study, the autosegmental alignment of the features, [±nasal]; [±ATR]; [labial], [coronal], [dorsal]; [±high] and [±back] are explored to capture the association/spread of feature(s) from *trigger* segments to *target* segments in the aforementioned assimilation processes most of which typify feature-filling assimilation processes.

Keywords: Èwùlù, segmental assimilation processes, trigger segments, target segments, features

1. Introduction

Assimilation is a phonological phenomenon that occurs in languages of the world, Nigerian languages inclusive, specifically those of the Benue Congo phylum. As one of the members of this language phylum, Èwùlù (Igboid) is not exempted from the effect of assimilation in its native phonology, as assimilation affects both the featural content(s) of segments (consonants and vowels) and the tones they bear. However, the effect(s) that assimilation has on the feature of segments in Èwùlù is the focus of this work.

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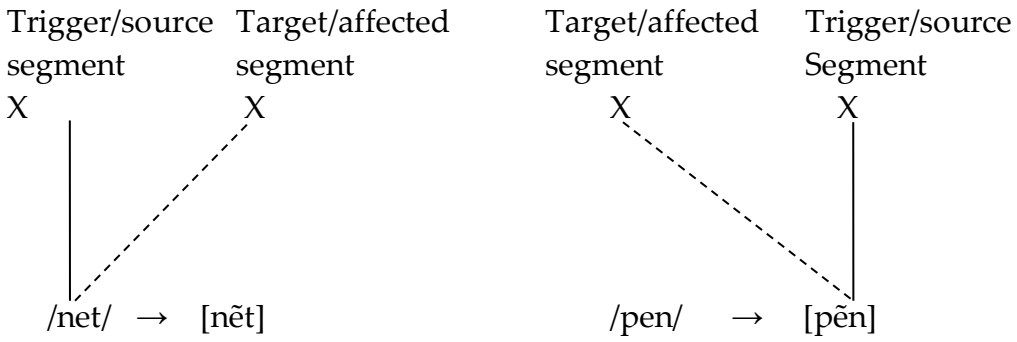
According to Gussenhoven and Jacobs (2011), assimilation is a phonological process that involves the adoption of a feature by one segment from another. In other words, assimilation is the influence exerted by one sound segment upon the articulation of another in such that both segments assume total or partial structural identity in the course of speech production. The motivation of segmental assimilation processes (for instance, the one that quite common amongst the Benue Congo group of languages) e.g. vowel nasalisation, vowel harmony, homorganic nasal assimilation, vowel assimilation, palatalisation, labialisation, spirantisation, among others, has been linked to the need for speakers to make the task of speaking easy and effortless (Katamba, 1989), or to maintain fluency or rhythm particularly in connected speech (Crystal, 2008).

In this study, the researcher, using existing Èwùlù data culled from (Utulu, 2015a, 2015b & 2018), examines specifically four different segmental assimilation processes namely, vowel nasalisation, vowel harmony, homorganic nasal assimilation and vowel assimilation deployed in the native phonology of the lect to modify sound segments. The sole aim of the current study is to provide more insight into some recurrent natural phonological phenomena found in Benue Congo languages from a dialectal perspective.

Universally, segmental assimilation processes are basically of two types based on the nature of the affected/target segment: (1) feature-filling assimilation, and (2) feature-changing assimilation (Clements and Hume, 1995). The former mode of assimilation applies if assimilation rule (as will be shown in Sections 3.1 through 3.3) spreads totally only to feature(s) that are not already specified in the target segment, in what has been referred to as *total assimilation* or *complete assimilation*. The latter mode of assimilation (see particularly discussions in Section 3.4) applies if the original featural value(s) of the target segment is totally replaced or changed by that of the trigger segment.

Accordingly, in the examination of the Èwùlù segmental assimilation processes, the study employs the autosegmental theory proposed by Goldsmith (1976). The theory recognises all assimilation processes as those which *associate* or *spread* feature(s) (see Clements and Hume, 1995; Jurgec, 2011) of one segment A to a neighbouring segment B rather than *copy* of features, the latter assumption popular with the theoretical tenets of the SPE proposed by Chomsky and Halle (1968). Illustrating with the familiar language, English, the words 'net' and 'pen' exemplify two cases of feature-filling assimilation as 'spread' of feature(s) in two different directions, one to the right and another to the left, as (1) depicts:

(1)



In (1) which expresses a typical process of segment/nasal assimilation, segment /n/, the trigger segment in 'net' spreads its nasality feature in *progressive* fashion on to the following vowel /e/, the target segment to become phonetic [ẽ]. Conversely, in 'pen', the trigger /n/ spreads the same inherent nasality feature *regressively* on to the target /e/ to become [ẽ]. In the two cases, the same phonetic implementation is involved but the *direction* of execution is different.

The difference in direction of segmental process illustrated in (1) is captured by the autosegmental notations of solid association lines (_____) and broken association line (_ _ _). The distinct directions in the templates in (1) would therefore define what phonologists mentioned in the foregoing would refer to as *progressive/perseverative nasal assimilation* and *regressive/anticipatory nasal assimilation* respectively, and precisely vowel nasalisation process.

It is worth mentioning that the formats in (1) are useful in the description/analysis of all phonological processes that spread features either by 'filling' or 'changing' feature(s) in languages. Thus, in the rest of this work the study would employ the formats to explain the segmental assimilation processes of Èwùlù mentioned in the foregoing.

2. The Èwùlù Dialect

Èwùlù is an Igboid, a sub-variety of the Igbo language classified under the West Benue Congo languages (Blench, 1989; Williamson, 1989). Èwùlù has been reported to be one of the varieties of western Igbo dialects of the Ànìọ́chá-Énúànì dialect clusters spoken in Delta State, Nigeria, with approximately 15,000 native speakers, according to 2006 population census (Ezimechine, 2014; Utulu, 2015a). The most contiguous Igboid dialects to Èwùlù are Ogwashi-Ukwu, Oloodu, Isheagwu, Ukwu, Adonte and Igbuzor.

Until recently, the Èwùlù dialect was not been given research attention it deserves to sustain its existence as a small language highly susceptible to threats of linguistic mobility and globalisation. However, quite a few linguistic studies have emerged on the dialect, but most predominantly at the phonological level. Much of such studies and documentation are being encouraged in order to sustain the dialect and save it from imminent extinction. In the following Section, the study briefly describes the Èwùlù phonological system as it is relevant to understanding the structural changes that apply to the segments which yield the aforementioned assimilation processes.

2.1 Phonological System of Èwùlù: an Overview

Like any other natural language/dialect, the Èwùlù phonological system is implemented on the basis of a systematic organisation of segments (consonants and vowels) and the prosody (syllable and tone) to form meaningful words, morphemes, phrases and clauses in discourse. Èwùlù has twenty-five consonant phonemes /p, b, β, ɓ, w, m, n, ɲ, ŋw, f, t, d, s, z, l,ɾ,j, tʃ, dʒ, ʃ, k, g, kw, gw, h/ and nine oral vowels phonemes /i, ɪ, e, ɛ, a, u, ʊ, o, ɔ/ which inherently bear some tone (Utulu, 2015a, 2015b).

The oral vowels, see Section 3.1 may acquire redundant nasality features lexically after (and never before) nasal consonants /m, n, ɲ, ŋw/ to become nasalised /ĩ, ɪ̃, ẽ, ɛ̃, ã, ũ, ʊ̃, õ, ɔ̃/ akin to the English examples in (1). It is interesting to note that the aforementioned vowels may

pattern in a sort of featural harmony called ATR, i.e. Advanced Tongue Root harmony. Following Stewart (1967), Lindau (1975), Emenanjo (1978), the Èwùlù vowel are sub-divided into two sets based on the [±ATR] features (Utulu, 2015b). The two sets of vowels are /i, e, u, o,/ and /ɪ, ɛ, a, ʊ, ɔ/ and are specified with the [+ATR] and [-ATR] features respectively (see analysis of this phenomenon in Section 3). It should be noted however that /a/ sometimes patterns with [+ATR] vowels in Èwùlù, e.g. /àwò/ 'cloth(e)', /àdù/ 'bitter kola', /áɓè/ 'calabash', /àkú/ 'door' etc. for no obvious phonetic reason.

With systematic combination of the consonants and vowels listed above, the syllable is formed in Èwùlù as is the case in any natural language. The Èwùlù syllable structure is maximally structured into a consonant immediately followed by a vowel. However, a vowel may stand alone, a pattern quite common with pronominals. Or a vowel may functions as prefix in certain words/morphemes. By implication, Èwùlù syllable structure is open, void of coda consonant. Tautosyllabic /VV/ sequence is not attested, though heterosyllabic /V.V/ sequence occurs quite frequently both at the lexical and postlexical levels. At the latter level, right and left edge vowel elements often yield heterosyllable V.V sequence due to juxtaposition of words or morphemes in phrases or clauses. Thus a word such as *isii* 'six' is appropriately parsed as /ì.sí.ì/ and not /*ì.sîi/ while a phrase such as *ísí éwú* 'goat head' is appropriately syllabified as /í.sí.é.wú/ and not /*í.síé.wú/.

Moreover, Èwùlù syllable lacks onset clusters. However, the only phonotactically permissible cluster in this category is the NC cluster, in which a tonally specified syllabic nasal (N) may precede a consonant (C). The N may be a labial /m/, coronal /n, ɲ/ or dorsal /ŋ/ nasal consonants while the C may be a nasal, obstruent or sonorant consonant. The N and the C are phonotactically followed by a vowel to form a word, as in /m̀.má.nʊ́/ 'oil' /ḿ.ɓɔ́/, 'bullet', /ń.lɔ́/ 'dream', etc. In Section 3, the paper demonstrates how the segmental structures discussed briefly above phonologically impact upon the segmental assimilation processes attested in Èwùlù.

3. Segmental Assimilation Processes in Èwùlù

In Sections 3.1 through 3.4, a description and autosegmental analysis of four segmental assimilation processes in Èwùlù namely, vowel nasalisation, vowel harmony, homorganic nasal assimilation and vowel assimilation processes are undertaken, with a view to providing further insight into some recurrent natural feature spreading phonological phenomena found in Benue Congo languages, and particularly dialects of this phylum in the Nigerian context.

3.1 Vowel Nasalisation (or Nasal Assimilation) Process

Every oral vowel that is preceded by nasal consonants /m/, /n/, /ɲ/ and /ŋw/ in discrete words or in connected speech in Èwùlù characteristically acquires the manner feature [+nasal] of any of the respective nasal consonants listed above. Like languages such as English, Igbo etc., Èwùlù nasal vowels are not opposed to oral vowel. This patterning differentiates the Igbo language and several of its dialects from other languages such as Urhobo (Aziza, 2002), Isoko (Yul-Ifode, 2008) and other several Edoid languages and Yoruba (as well as French), in which oral vowels and their nasal counterparts contrast.

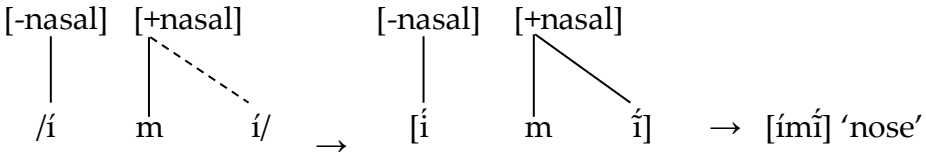
As shown in (2), vowel nasalisation is strictly phonetically realised after nasal consonants in discrete words, though the process can apply in connected speech as demonstrated in Utulu (2018).

(2) Nasalisation of Oral Vowels in Èwùlù

a.	/ímí/	→	[ímḯ]	'nose'
b.	/ʊ́mʊ̀/	→	[ʊ́mʊ̋]	'children'
c.	/ánʊ́/	→	[ánʊ̋]	'meat'
d.	/ínì/	→	[ínḭ̀]	'tomb'
e.	/ɛ́ŋá/	→	[ɛ́ŋã́]	'eye(s)'
f.	/úŋì/	→	[úŋḭ̀]	'dirt/charcoal'
g.	/ŋwá/	→	[ŋwã́]	'child'
h.	/ɔ́ŋwá/	→	[ɔ́ŋwã́]	'moon'

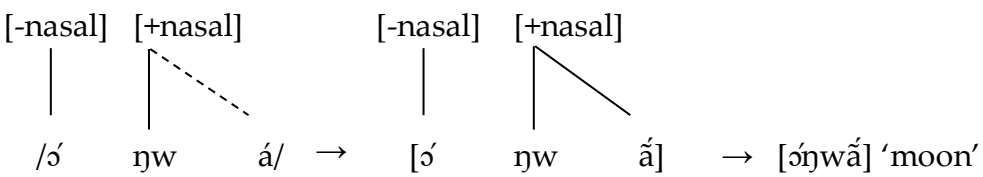
As the forms in (2) show, only the vowels after nasal consonants are nasalised. As in many Benue Congo languages, e.g. Urhobo, Isoko, Yoruba etc., the Èwùlù vowels before nasal consonants are not so affected by the nasalisation process. The autosegmental analysis in (3) and (4) express the structural change in (2) where nasal consonants spread their inherent [+nasal] feature on the following oral vowel, citing the form in (2a) as follows:

(3) Spreading of [nasal] feature on oral vowel (Progressive nasal assimilation I)



The same structural cause is demonstrated in (4) as follows, citing the form, [ɔ́ŋwã́] 'moon' in (2h):

(4) Spreading of [nasal] feature on oral vowel (Progressive nasal assimilation II)



As the autosegmental broken association line in (3) and (4) shows, the nasal feature of /m/ and /ŋw/ associates/spreads rightward to the right edge vowels /i/ and /a/, both which

subsequently become /ĩ/ and /ã/ respectively. As demonstrated, implementation of progressive nasal assimilation process is depicted by the respective broken lines.

3.2 Vowel Harmony

Another sub-class segmental assimilation process like the one discussed in Section 3.1 in Èwùlù is vowel harmony. Vowel harmony is the assimilation of a vowel feature/quality by another vowel(s) within a phonological string, which follows strictly a constraint on tongue root extension or retraction. The role tongue root constraint plays in the phonetic realisation of vowel segments necessitated the proposal of the privative features [+ATR] and [-ATR] (Stewart, 1967; Lindau, 1975). Meanwhile, a number of studies (e.g. Casali, 2008; Iloene, 2010, Smolek, 2010, among others) have emerged which describe the harmonic patterning of vowels within words and morphemes in many African languages including Igbo.

As remarked in Section 2.1, the nine vowels of Èwùlù /i, ɪ, e, ɛ, a, u, ʊ, o, ɔ/ which participate in the tongue root harmonic constraint are sub-divided into two sets. The examples in (5) and (6) illustrate the combination of vowels in each set of vowels within the word based on ATR harmony:

(5) The Harmony of Èwùlù [+ATR] Vowels
(/i, e, u, o/)

a.	/ígwè/	'bicycle'
b.	/émò/	'sickness'
c.	/úlù/	'gain
d.	/ójí/	'cold'
e.	/égó/	'money'
f.	/ékwò/	'back skull'
g.	/ósè/	'pepper'
h.	/éwú/	'goat'
i.	/ókwú/	'word/utterance'
j.	/ónú/	'neck'
k.	/óβòlókõ/	'stock fish'

As (5) illustrates, the entire words are composed of [+ATR] vowels /i, e, u, o/. The phonology of the lect thus ensures that all [–ATR] vowels are barred from occurring in the strings in (5). The tongue root restriction also constrains [+ATR] vowels from occurring in the domain of [–ATR] vowels, as the forms in (6) illustrate:

(6) The Harmony of Èwùlù [-ATR] Vowels
(/ɪ, ɛ, a, ʊ, ɔ/)

a.	/ágwɔ́/	'snake'
b.	/áʃʃí/	'pelvic'
c.	/ɛ̀kwá/	'egg'
d.	/ɔ̌jɪ̀/	'friendship'

e.	/ɔ́kwʊ́kwʊ̀/	'fowl'
f.	/ɛ́kwɔ̀/	'ring worm'
g.	/ɛβà/	'bag'
h.	/ɛ́wɔ̀/	'toad'
i.	/ɔ̀nʊ̀mà/	'anger'
j.	/ɔ́nʊ́/	'mouth'
k.	/ɛ́βílíβá/	'a rash'

It is interesting to note that the two harmonising features may contrast word meanings, e.g. /ókwú/ 'word' vs. /ɔ́kwʊ́/ 'fire, /ónú/ 'neck' vs. /ɔ́nʊ́/ 'mouth'. The autosegmental representations in (7) and (8) express the long-distance spread/assimilation of ATR on vowels, taking the syllabically complex words in (5k) /óβòlókɔ̄/ 'stock fish' and (6k) /ɛ́βílíβá/ 'a rash' respectively as follows:

(7) Long Distance [+ATR] Spread

Similar long distance harmonic spread is illustrated in lexically specified -ATR in the word /ɛ́βílíβá/ 'a rash', as shown in (8):

(8) Long Distance [-ATR] Spread

Moreover, the ATR status of prefixes in certain Èwùlù morphemes is determined by that of the root. For instance, in cognate nouns, nouns formed from simple verb roots, prefixes take on the ATR feature of their roots, as the examples in (9) and (10) show:

(9) [+ATR] Spread from Root Verbs to Prefixes in Èwùlù Cognate Nouns

	Prefix		Verb Root	Cognate Noun
a.	/í/	+	/bù/ 'be fat'	/í-bù/ 'fatness
b.	/ó/	+	/kwú/ 'say'	/ó-kwú/ 'word'

c.	/é/	+	/wù/ 'be famous	/é-wù/ 'fame'
d.	/ù/	+	/ʤú/ 'be full'	/ù-ʤú/ 'surplus/wealth
e.	/í/	+	/ƥé/ 'complain'	/í-ƥé/ 'complaint'

The verbal nominalisation process in (9) takes into cognisance constraint on tongue root harmony, precisely [+ATR] harmony which has been discussed in (5) through (8). The same morphological and phonological operations in (9) spread [–ATR] feature unto the forms in (10) as follows:

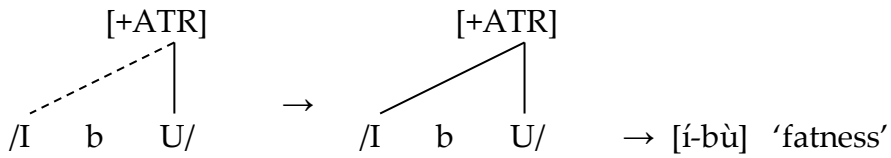
(10) [-ATR] Spread from Root Verbs to Prefixes in Èwùlù Cognate Nouns

	Prefix		Verb Root	Cognate Noun
a.	/ɔ́/	+	/lʊ́/ 'work, vb'	/ɔ́-lʊ́/ 'work, Nn'
b.	/ʊ́/	+	/ʤɔ́/ 'be afraid'	/ʊ́-ʤɔ́/ 'fear/fright'
c.	/ɛ́/	+	/mʊ́/ 'laugh'	/ɛ́-mʊ́/ 'laughter'
d.	/á/	+	/lí/ 'creep'	/á-lí/ 'ear worm'
e.	/í/	+	/kʊ̀lʊ́/ 'stand'	/í-kʊ̀lʊ́/ 'if you stand'

Note: vb = verb; Nn = noun

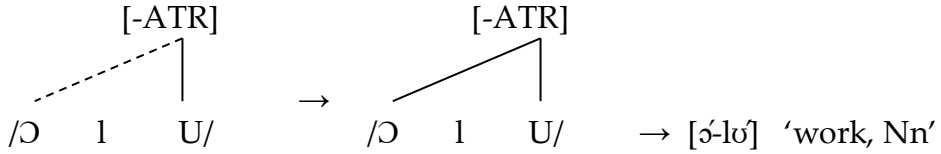
The autosegmental analysis in (11) and (12), taking the examples *i-bu* 'fatness' and *ɔ-lʊ* 'work, Nn' in (9) and (10) respectively insightfully captures the harmony between verb root vowels and prefixes in the derivation of Èwùlù cognate nouns:

(11) [+ATR] Harmony Spread/Assimilation in Cognate Noun



The insight from the autosegmental model clearly explicates the leftward direction of assimilation/spread of +ATR feature, an obvious case of anticipatory or regressive +ATR spread. Accordingly, the direction of spread of the opposing feature, -ATR in (12) takes the same pattern in (11) thus:

(12) [-ATR] Harmony Spread/Assimilation in Cognate Noun



3.2.1 ATR Disharmony

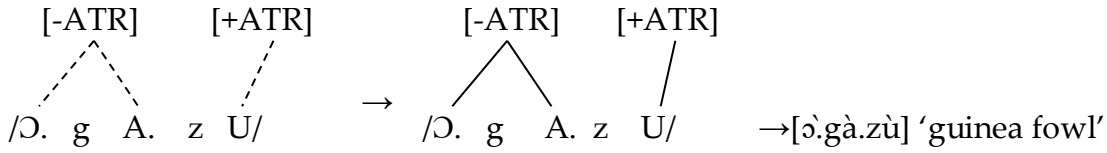
While the data in (9) and (10) unequivocally exhibit complete systematicity of anticipatory ATR spreading/assimilation, in that vowels of +ATR and –ATR sets are strictly confined within their domain, the data in (13) show that such featural confinement is not always adhered to strictly. The forms in (13) show cases where +ATR and –ATR vowels, called 'opaque' vowels co-occur within the same word. The term 'disharmony', culled from Clements (1981) has been used to describe such incoherent behaviour, tagged 'ATR disharmony'. For instance, the opaque vowels /a/ and /ɛ/, –ATR/ tend to harmonise with +ATR vowels, as the forms in (13) demonstrate:

(13) ATR Disharmony in Èwùlù

a.	/àwò/	'cloth(e)'
b.	/nɔ̀gàdʒì/	'spoon'
c.	/áβàtì/	'luggage'
d.	/ɔ̀gàzù/	'guinea fowl
e.	/úβɛ́/	'lantern'
f.	/àβó/	'larynx'
g.	/nʈùnɛ̀/	'buttocks'
h.	/òsíkápá/	'rice'
i.	/àkú/	'door'
j.	/ótùmɛ̀/	'naval'
k.	/ágéné/	'edge'

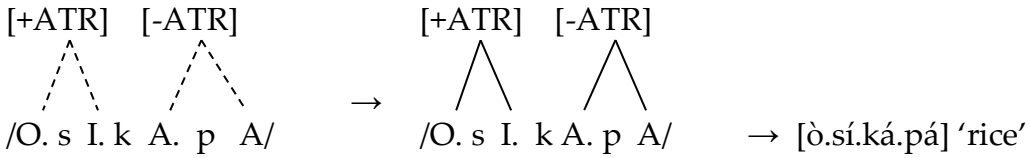
As can be seen, the examples in (13) show ATR disharmony, in which vowels with opposite values for ATR are specified within the same word. One plausible way to characterise the ATR disharmony autosegmentally, according to Clements, see also Gussenhoven and Jacobs (2011:203), in his analysis of opaque vowel /ɑ/ in Akan vowel harmony, is to allow the floating [+ATR] feature and the associated [-ATR] spread to their half of the word as shown in (14) and (15), taking the forms, /ɔ̀gàzù/ 'guinea fowl' in (13d) and /òsíkápá/ 'rice' in (13h):

(14) Disharmonic Underived Morpheme I



A similar structural cause applies to the example in (15), where disharmonic syllable domains as in (14) will surface with opposite values for [ATR].

(15) Disharmonic Underived Morpheme II



As (14) and (15) demonstrate, the associated features [-ATR] and [+ATR] each spread to the terminal point of their respective syllable domain in accordance with the strict constraint on vowel harmony of the lect.

3.3 Homorganic Nasal Assimilation

Èwùlù is one of the several Benue Congo languages that operate NC sequence, i.e. a cluster of nasal and a consonant followed by a vowel. Notable among languages with NCV are Igbo(id), Yoruba, Ebira, Nupe etc. The fascinating behaviour of NC sequence is that it triggers *homorganic nasal assimilation,* or alternatively, *place feature assimilation*. In Èwùlù, for example, the alveolar nasal stop /n/ has five allophonic variants: [m, ɱ, n, ɲ, ŋ], each alternation resulting from the effect of assimilation.

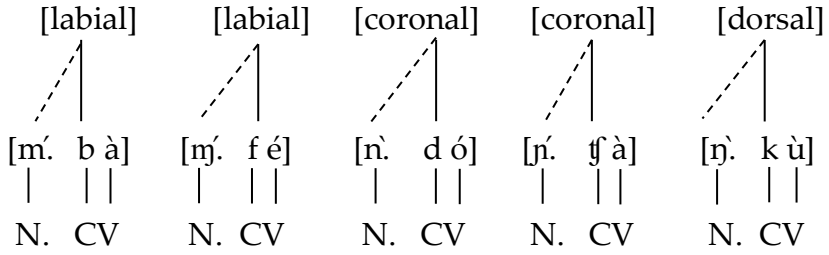
Basically, [m, ɱ, n, ɲ, ŋ] in (16) are crucially realised on the basis of the phonetic implementation of 'place' articulation of labial /p, b, f/, alveolar /t, d, l, r/, palatal /ʧ, ʤ/ and velar /k, g/ consonants respectively (Utulu, in preparation). The forms in (16), adapted from (Utulu, in preparation) exemplify the /n/ alternation culminating in the process of homorganic nasal/place feature assimilation:

(16) NC Sequence and Homorganic Assimilation Process in Èwùlù

	/N/		/C…/				
a.	/ń	+	bà/	→	[m̀bà]	'no'	Labial place
b.	/ǹ	+	ɓàdà/	→	[m̀ɓàdà]	'antelope'	assimilation
c.	/ń	+	fé/	→	[ɱ́fé]	'Should I fly?'	
d.	/ǹ	+	dó/	→	[ǹdó]	'sorry'	Alveolar place
e.	/ǹ	+	tú/	→	[ǹtú]	'nail'	assimilation
f.	/ń	+	ʧà/	→	[ɲ́ʧà]	'soap'	Palatal place
g.	/ǹ	+	ʧì/	→	[ɲ̀ʧì]	'grass cutter'	assimilation
h.	/ǹ	+	gàdʒì/	→	[ŋ̀gàdʒì]	'spoon'	Velar place
i.	/ǹ	+	kù/	→	[ŋ̀kù]	'feather'	assimilation

In autosegmental model, the labial, alveolar, palatal and velar place of articulation, which is purely a process that associates place feature to the left (see broken association line in (17)), in what reflects the regressive/anticipatory assimilation type, is insightfully captured using Sagey's (1986) unary features, [labial], [coronal] and [dorsal] as follows:

(17) Homorganic Nasal Assimilation in Autosegmental model



Adapted source: (Utulu, in preparation)

3.4 Vowel Assimilation

The assimilation processes explored so far are principally the ones that apply in discrete words/morphemes and exemplify the feature-filling mode of assimilation. In this section, the examination of vowel assimilation process is done. Alignment of vowel feature to adjacent vowel is purely an assimilation process that exhibits *feature-changing* mode, largely operational in connected speech. In the process, the original featural value of a target segment is characteristically replaced with that of a trigger segment via spreading.

Phonologists working on this mode of assimilation in the Benue Congo context (e.g. Emenanjo, 1978; Yul-Ifode, 2008; Abiodun, 2010, among others) have defined vowel assimilation as a process whereby vowels assimilate to other adjacent vowels across boundaries. In Èwùlù, adjacent vowels in hiatus (i.e. two boundary vowels belonging to separate syllables) are typically prone to assimilation of feature(s). The following examples in (18) demonstrate vowel assimilation processes.

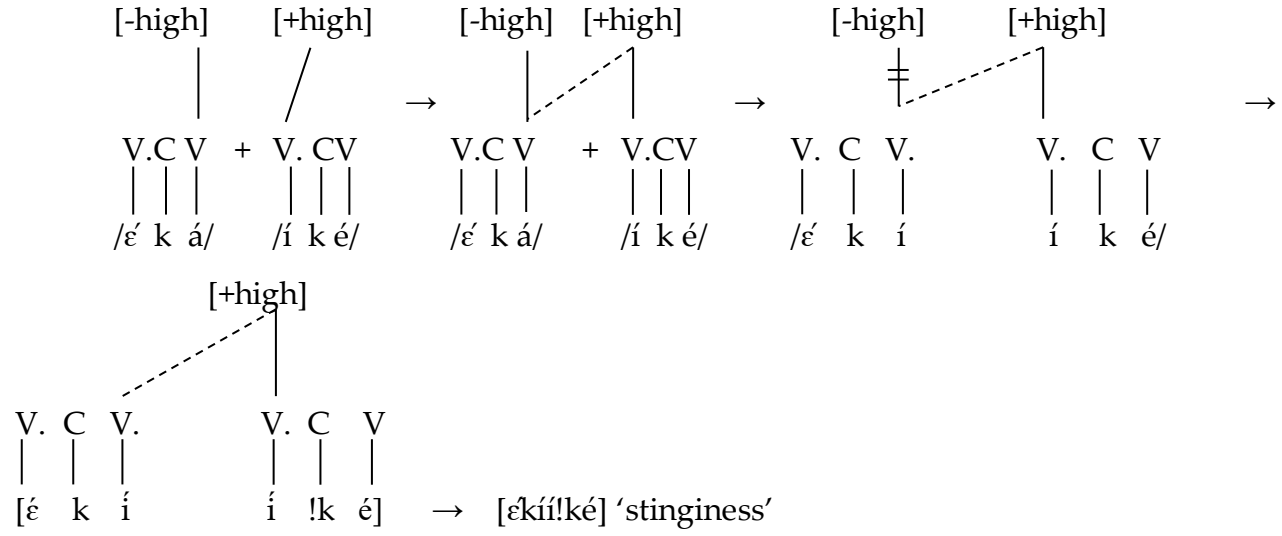
(18) Vowel Assimilation in Èwùlù

a.	/ɛ́ká/	+	/íké/	→	[ɛ́kíí!ké]
	'hand/arm'		'hard'		'stinginess'
b.	/ʊ́nɔ̀/	+	/énú/	→	[ʊ́nèé!nú]
	'house'		'top'		'upstairs'
c.	/ɛ́ɓà/	+	/égó/	→	[ɛ́ɓèé!gó]
	'bag'		'money'		'bag money'
d.	/íɓé/	+	/ànɪ̀/	→	[íɓáànɪ̀]
	'quarrel'		'ground'		'land dispute'
e.	/ìtè/	+	/ɔ́kwʊ́/	→	[ìtɔ̀ɔ́!kwʊ́]
	'pot'		'fire'		'hot pot'
f.	/òté-è/	+	/ófé/	→	[òtóó!fé]
	'cooker'		'soup'		'greeting for women in Èwùlù'
g.	/úɓɛ́/	+	/úkwú/	→	[úɓúúkwú]
	'lantern'		'large'		'large lattern'

In (18) there is a complete assimilation of the first (target) boundary vowel, conceived here as V_1 to the following (trigger) boundary vowel, labelled V_2, thus implicating the derivational format, $V_1 + V_2 \rightarrow V_2V_2$, following Emenanjo (1978:23). Specifically, as the forms in (18a – g) show, all target V_1 vowels completely assimilate the quality/feature of the trigger V_2 vowels. The result of the total assimilation process is the realisation of surface [ii, ee, ee, aa, ɔɔ, oo, uu] from the respective underlying forms,/ai, ɔe, ae, ea, eɔ, eo,ɛu/.

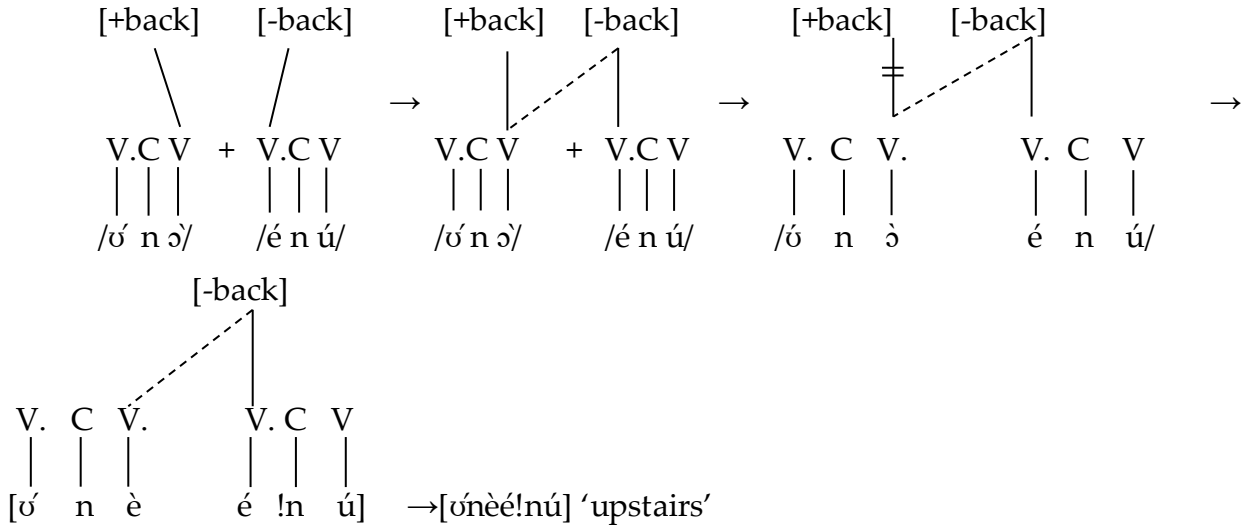
This type of complete regressive vowel assimilation is analysed autosegmentally in (19), taken the form *ɛkaike* in (18a) becoming *ɛkiike* 'stinginess'.

(19) Total Right-to-Left (Regressive) Vowel Assimilation



In (19) the autosegmental model clearly expresses the spread/association of [+high], the specified feature for the trigger segment (V_2) to the left, thus completely absorbing, i.e. effacing the [-high] feature of the target (V_1) from the derivation. Accordingly, the nonlinear model in (19) will formally express the existing 'pattern congruity' also displayed in (18b - g). However the spreading of feature of the specific V_2 node will vary, as (20) depicts, taking the form in (18b) as a case study:

(20) Total Right-to-Left (Regressive) Vowel Assimilation



Relatively, pattern congruity is maintained in (19) and (20) regardless of the apparent asymmetrical featural specification, yielding '[+high]-spreading' in (19) and '[-back]-spreading' in (20). Nonetheless, the assimilation of vowel feature/quality in both cases still expresses total regressive vowel assimilation.

4. Summary and Conclusion

This study has described some core segmental assimilation processes, namely vowel nasalisation, vowel (dis)harmony, homorganic nasal assimilation and vowel assimilation from a dialectal perspective, focusing primarily on Èwùlù a dialect of Igbo spoken in the northern part of Delta State, Nigeria. Description/analysis of the phonological phenomena of the lect outlined above was couched in the theoretical assumption of the standard model of the autosegmental theory which views assimilation of linguistic feature(s) as phenomenon that spread feature(s). The study using association lines and relevant autosegmental notations explored Èwùlù data mostly in their discrete form. However a few data in spontaneous connected speech were explored in the study in order to underpin boundary segmental assimilation process specifically known as vowel assimilation process.

In the study, data showed the occurrence of nasal assimilation in which vowels preceded by nasal consonants became nasalised; nasal consonants preceding non-nasal consonants in NC sequence assimilated the place feature of the latter consonant. Moreover, data revealed that the established nine Èwùlù vowel phonemes are systematically divided into

two sub-systems based on the rule of tongue root harmony. However, a number of data showed disharmony of the tongue root feature otherwise known as ATR, as some specific vowels referred to as opaque vowels in the phonological literature, particularly the low central vowel /a/ and high low front vowel /ɛ/ co-occur with vowels of the two sub-systems. Finally, the study examined the patterning of boundary vowels in hiatus context, where the trigger vowel (V_2) typically assimilated the feature(s) of target vowel V_1 in a rather complete regressive assimilatory mode.

Significantly, the study explored two broadly categorised universal assimilation types: feature-filling and feature-changing modes from a dialectal perspective. The study thus provides additional insight into some recurrent natural feature spreading phonological phenomena found not only in languages of the Benue Congo phylum but in their numerous dialects, a larger number of them (Èwùlù inclusive) yet to receive rigorous scholarly research attention.

References

Abiodun, M. (2010). Phonology. In *Basic Linguistics for Nigerian Languages*. O. Yusuf (ed.) Port-Harcourt: Landmarks Research Foundation, University of Port Harcourt.

Aziza, R. O. (2002). Nasality in Urhobo: An Autosegmental perspective. *Journal of West African Languages,* 29. 2: 11-21.

Blench, R. M. (1989). A Proposed New Classification of Benue-Congo Languages. *Afrikanische Arbeitspapiere, Köln*, 17:115-147.

Casali, R. F. (2008). 'ATR Harmony in African Languages' *Language and Linguistics Compass* 2. 3. JSTOR. Web, 496-549.

Chomsky, N. and Halle, M. (1968). *The Sound Pattern of English*. New York. Haper and Row.

Clements, G. N. (1981). Akan Vowel Harmony: A Non-linear Analysis. In G.N. Clements (Ed.), *Harvard Studies in Phonology* 2. Bloomington: Indiana University Linguistics Club.

Clements, G. N. and Hume, E. V. (1995). The Internal Organization of Speech Sounds. In J.A. Goldsmith (Ed.). *The Handbook of Phonological Theory*, 245-306.

Crystal, D. (2008). A *Dictionary of Linguistics and Phonetics*. (Sixth edn.), London: Blackwell.

Emenanjo, E. N. (1978). *Elements of Modern Igbo Grammar*. Ibadan: Oxford University Press.

Ezimechine, E. O. (2014). A History of Ewulu People of Delta State, Nigeria, from the Earliest Time up to 1960. M.A. Dissertation, University of Ibadan, Ibadan.

Goldsmith, J. A. (1976). *Autosegmental Phonology. Bloomington*: Indiana University Linguistics Club.

Gussenhonven, C. and Jacobs, A. (2011). *Understanding Phonology*. Hodder Education, Hachette Livre, UK.

Iloene, G. (2010). Igbo Phonology. In O. Yusuf (ed.). *Basic Linguistics for Nigerian Languages*. Shebiotimo Publications, 169-187.

Jurgec, P. (2011). Feature Spreading 2.0: A Unified Theory of Assimilation. Ph.D Thesis, University of Tromso.

Katamba, F. (1989). An Introduction to Phonology. London: Longman Group Ltd.

Lindau, M. (1975). Features for Vowels. *UCLA Working Papers in Phonetics.*

Sagey, E. C. (1986). The Representation of Features and Relations in Non-linear Phonology, PhD, MIT.

Smolek, A. (2010). Vowel Harmony in Tuvan and Igbo: Statistical and Optimality Theoretic Analyses. Doctoral Thesis. Swarthmore College.

Stewart, J. M. (1967). Tongue Root Position in Akan Vowel Harmony. *Phonetica 16*,185-204.

Utulu, D. C. (2015a). Èwùlù Tone System: A Preliminary Investigation. In *Uniuyo Journal of Humanities* 9: 1. 106-125.

_____ (2015b). Verbal Reduplication in Ewulu. In *ANSU Journal of Arts and Social Sciences*, Vol. 1 (4).The Faculty of Arts and Social Sciences, Igbariam: Anambra State University.

_____ (2018). The Patterning of Segments and Tones in Èwùlù Compounding Process. *International Journal of Humanities, Social Sciences and Education*, Vol. 5 (3), p. 1-10.

_____ (in prep). Syllable Structure Constraints, Repair Strategies and Segmental Processes in Èwùlú.

Williamson, K. (1989). Benue-Congo Overview. In *The Niger-Congo Languages*. J. Bendor-Samuel ed. 246-274. Lanham: University Press of America.

Yul-Ifode, S. (2008). *A Course in Phonology: with an Appendix on: Williamson's Distinctive Features.* Port Harcourt: Riverside Communications.