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# A DESCRIPTION OF SOME STRUCTURES OF (UN)DERIVED TONES IN ÈWÙLÙ NOUNS

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**Abstract:**
This paper describes some structures of underived and derived tones in Èwùlù (Igboid: West Benue Congo, Delta State, south-south, Nigeria) nouns. Many studies on tone structures of Igbo are generally those carried out on the 'central' variety and a number of Eastern Igbo dialects, east of the Niger River to the neglect of the varieties of the western area of the river labelled, 'Western Igbo/Delta Igbo'. In contribution to, and in furtherance of research studies on Igbo tone phonology from a geo-dialectal perspective, the present paper examines the structures of derived and underived noun tones in Èwùlù. In the analysis, which incorporates acoustic instrumentation (SFS/WASP computerised speech laboratory) in visualisation of the perceived alternations in tone melodies, it was found that tones largely change due to assimilatory effect of other adjacent tone. Likewise, it was observed that, depending on possible lexical tone sequence combinations, underived tone melodies were altered when used in associative (noun-noun) constructions. Some of the observed tonal changes are common phenomena found in central Igbo/Benue Congo languages, while some of the tonal modifications are peculiar to Èwùlù.

**Keywords:** Èwùlù, Igbo, Delta Igbo, nouns, underived tones, derived tones

## 1. Introduction

Èwùlù (Igboid: Benue Congo, Delta State, south-south, Nigeria) is a registered, terraced tone language with two pitch levels, the high (H) and the low (L) (Utulu, 2015). In addition to these two levels is a third pitch phenomenon referred to as Downstep which may or may not associate to a vowel. As would normally be expected of tonal languages, specifically those of the Benue Congo group (e.g. Igbo, Yoruba, Urhobo, Edo/Bini, Ghotuo, Emai, Etsako, and Ibibio, among many others) the specification of H, L pitch level on syllables determines the meaning of the word.

In Èwùlù, as Utulu (2015) notes, the noun words, éwú *'goat'*, éwù *'fame'* are semantically differentiated by two level contrasts based on HH, HL sequence. Quite a number of studies have explored the structural patterns of lexical and grammatical tones in Igbo. The focus of the existing

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studies has largely been on tone patterns of the central variety (e.g. Emenanjo, 1978; Williamson, 1986; Pulleyblank, 1986; Clark, 1990; Liberman et al, 1993; Yip, 2002; Iloene, 2010, among others). Some of the researchers have investigated the tone structures of dialects spoken in the eastern part of the Niger River (e.g. Umuchu-Igbo: Okorji, 1998; Uhuhu-Igbo: Goldsmith, 1999; Mgbidi-Igbo: Oha, 2007; Ngwa-Igbo: Ugorji, 2017, among many others). However, studies that examined tone patterns of the varieties of the western area of the River Niger labelled, 'western Igbo'/Delta Igbo', an amalgam of Ànị̀ọ́chá-Òshìmìlì-Ị̀ká-Ụ̀kwúàní dialects, have been little. On the basis of the obvious limitation, the central goal of this paper is to add to the quantity of literature on Igbo tone phonology by shedding light on the lexical and grammatical tone structures of its noun class from a geo-dialectal perspective.

As will be shown in some detail in this work, a number of observed tone structures of Èwùlù variety of Igbo are common tonal phenomena in Igbo and vast majority of Benue Congo group of languages while some are peculiar to the dialect. On the examination of the tonal patterns recorded from a fluent Èwùlù male native speaker in visualisation/validation of the observed pitch changes, this paper incorporates acoustic instrumentation of pitch track of the SFS/WASP computerised speech laboratory developed in the University College London.

## 2. Èwùlù Noun

Like the general function of the noun category in languages, the noun refers to name of person, place or thing in Èwùlù. For example, the words, Òbí, *'a name'*, Ágbòr*'a town'* and ázù*'fish'*, stand for these tripartite functions of the noun. Lexically, nouns in Èwùlù, as in central Igbo, typically have initial vowel noun marker, differentiating them from verbs which typically lack such marker. Èwùlù nouns are of two types: (i) underived nouns, and (ii) derived nouns. The former type exemplified in the foregoing and in (1) is purely a morphologically indivisible root/stem void of affixes, whereas the latter type is generated from other grammatical categories, mostly derived from the verb category via affixation process (Utulu and Ajede, 2019).

The examination of some of the lexical and grammatical tone structures of the two noun types mentioned in the foregoing are the focus of this present study. The noun examples in (1a-j) and (2a-j) illustrate the two broad categories: (Note: only roots are in bold-faced print; bold-faced prints in 2a-j are verb roots from which the derived nouns are formed).

**Table 1:** Underived Nouns and Derived Nouns

| | **Underived Noun** | | | **Derived Noun** | |
|---|---|---|---|---|---|
| 1a) | **ụ́gbọ́** | 'canoe' | 2a) | ọ̀-lị́-**lá** | 'licking' |
| b) | **ézé** | 'teeth | b) | í-**bù** | 'fatness' |
| c) | **ánú** | 'meat' | c) | ó-**kwú** | 'word' |
| d) | **ẹ̀kpà** | 'bag' | d) | ụ́-**mụ̀** | 'children' |
| e) | **ụ̀wà** | 'world' | e) | ọ̀-**gbá**-à | 'shooter' |
| f) | **ṇchì** | 'giant rat' | f) | é-**wù** | 'fame' |
| g) | **àkú** | 'door' | g) | ṅ́-**ká** | 'ageing' |
| h) | **òkpú** | 'cap' | h) | ẹ́-**dá** | 'fall' |
| i) | **ọ́kà** | 'corn' | i) | ò-gú-**gú** | 'digging' |
| j) | **ígwè** | 'bicycle' | j) | í-**jè** | 'walk' |

As can be observed, the nouns in (1a-j) have morphologically null affixes. In fact, what appear to be prefixes in these forms are semantically empty word initial vowels (see section 2.1 for some detailed analysis of the syllable structures of the Èwùlù noun) that characterise the Igbo/Èwùlù nominal/noun class. Conversely, the derived nouns in (2a-j) are generated from simple verb roots through the process of affixation of an ATR-sensitive affixal vowel.

## 3. Syllable structures of the Èwùlù Noun

In the analysis of tone language, tones cannot be considered in total isolation from vowels, syllables or moras on which they are realised. Consequently, a description of the possible syllable structures of the Èwùlù noun becomes crucial in this work. Èwùlù tone is realised on the syllable and not on vowels or moras. This is so because the lect has syllabic nasals which bear tone (see 3c-d) and onset nasals which do not (see 1c; 2d). This is consistent with the assumption that, if [a] language has syllabic nasals which bear tone, but onset nasals which do not, the possibility of the segment being the tone bearing unit (TBU) is ruled out(Yip, 2002:73).

Èwùlù nouns have four possible syllable structures all specified for some tones. The four possibilities, as illustrated in (3a-d), are the V.CV, V.CV.CV, N.CV and N.CV.CV. The unmarked syllable structures of the underived noun in the dialect are the V.CV and N.CV (Utulu, 2020). The initial V noun marker in the V.CV syllable structure, as mentioned earlier, is semantically empty. The N in N.CV syllable structure is a tone-bearing syllabic nasal. It should be noted that the V.CV.CV and N.CV.CV syllable types are syllable extensions that result from affixational rules (see, for example, the forms in (2a, e and i)).Some sets of underived nouns such o̩kwu̩kwu̩ *'fowl'*, ó̩kwùlù̩, *'okro'*, e̩bu̩bà *'fat'*; ń̩gùgù, *'parcel'*, ǹ̩kàlà, *'cage'* etc. have V.CV.CV and N.CV.CV as their basic syllable types. The four syllable structures are illustrated in Table 3 as follows:

**Table 3:** Syllable Structures of the Underived (Mono-morphemic) Èwùlù Noun

| (a) | V.CV Syllable Structure | | (b) | V.CV.CV Syllabe Structure | | (c) | N.CV Syllable Structure | | (d) | N.CV.CV Syllable Structure | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **ọ́.nwá** | 'moon' | | **é.rí.rí** | 'cord' | | **ṅ̩.chà** | 'soap' | | **m̩̀.gbà.dà** | 'antelope' |
| | **á.nṵ́** | 'meat' | | **ì.tà.lị̀** | 'cain' | | **ǹ̩.shá** | 'comb' | | **m̩̀.bò.lò** | 'stone' |
| | **ú.kó** | 'cup' | | **á.kị̀.tị̀** | 'cheek' | | **ǹ̩.sí** | 'faeces' | | **ǹ̩.tù.nè̩** | 'buttocks' |
| | **é.gbè** | 'gun' | | **ò.lú.lú** | 'cotton' | | **ḿ̩.kpọ̀** | 'tin' | | **ǹ̩shí̩.kọ̄** | 'crab' |
| | **é̩.kwṵ́** | 'kernel' | | **é̩.shṵ̀.lṵ̀** | 'fart' | | **ṅ̩.sí** | 'poison' | | **ǹ̩.gè.lì** | 'rope' |
| | **ó.gbè** | 'clan' | | **à.gị̀.nị̀** | 'mat' | | **ṅ̩.tị̀** | 'ear' | | **ǹ̩.gà.jì** | 'spoon' |
| | **ọ̀.kpà** | 'cock' | | **ṵ́.gṵ̀.lṵ̀** | 'winter' | | **m̩̀.pì** | 'horn' | | **ǹ̩.dù.dù** | 'dampness' |

As can be seen in (3a-d), the range of syllable structures of underived Èwùlù noun is between two and three. Four syllable noun words are attested, as the word n.ki.ri.si *'stump'* with N.CV.CV.CV syllable structure suggests. However, quadric-syllabic mono-morphemic nouns (except for ideophones) are quite rare in the dialect.

## 4. Overview of Distribution of Tones in the Èwùlù Underived Noun

### 4.1 High Tone Distribution

In consideration of the nouns exemplified in (1a-j), (2a-j) and (3a-d), it will be observed that, on the one hand, the level H tone may occur syllable initially or finally, forming a tonal sequence such HL or LH. These distributions thus suggest that the H may precede or follow the L. On the other hand, the H may span entire syllables of underived noun words to yield patterns like H.H, H.H.H. In the Èwùlù tone system, syllable initial H tone of this sort is not allowed in a language like Yoruba, where syllable initial position is strictly the domain of the mid (M) tone or low tone (Akinlabi, 1985; Bamgbose, 1990).

Basically, H.H sequence in central Igbo typically attracts both 'lexical' and 'grammatical' downstep tagged 'non-automatic' downstep, in which underlying /H.H/ becomes surface [H.!H], with the second H downstepped by an unassociated abstract L tone. Examples of this phenomenon in central Igbo are é!gó *'money'*, í!gwé *'king'*, ń!né *'mother'*. On account of similar tonal phenomenon in Èwùlù, Utulu (2015) shows that underived H.!H sequence is not attested, thus ruling out surface lexical [*H.!H], though grammatical H.!H may occur.

### 4.2 Low Tone Distribution

Taking into account of the distribution of the level L tone based on the examples in (1) through (3), the L tone, like the H tone may be found in syllable initial, in which case it may precede or follow the H. Moreover, like the H, the L may span entire syllables of underived noun words, forming L.L, L.L.L sequence. Consequently, there is no restriction in the distribution of the Èwùlù L in any syllable positions in nouns.

### 4.3 Downstep Distribution

The distribution of downstep is rather restricted in Ewulu unlike the distribution of the H and L tones in a unit. In many two-tone languages of the Benue Congo group of language, downstep occurs in syllable/word final position when preceded by another high in words, yielding a phonetic form, [H.!H] (Etsako: Elimelech, 1976; Emai: Egbokhare, 1990; Urhobo: Aziza, 1997, Ibibio: Yul-Ifode, 2008, among others). While downstep applies in H.!H domain in the languages mentioned above, Èwùlù disfavours downstep in this domain. Downstep can only occur in words with H.H.!H tone sequence in the lect.

## 5. Analysis

### 5.1 The Structure of Underived/lexical Tone Melodies in the Èwùlù Noun

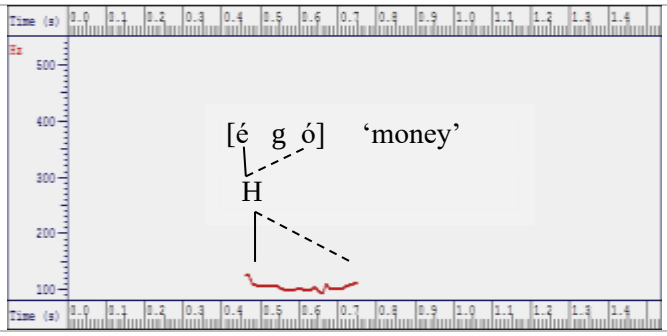
Tones in Èwùlù take the following structures in underived (i.e. lexical) nouns. The various structures are discussed and analysed. Acoustic analysis of pitch track of SFS/WASP computerised speech laboratory is done to enable visualisation of the melodies produced (see also Section 5.2 on derived tone structures on nouns) by an informant, a fluent male native speaker of Èwùlù.

### 5.1.1 Underived H.H Tone Melody

Èwùlù like the central Igbo allows H.H tone sequence in nominals. A sequence which attracts downstep in Igbo but is not allowed in Èwùlù, as asterisk (*) in Table 4 indicates. It is interesting to note that, like Èwùlù, some eastern Igbo dialects spoken mostly in Imo State, as (Emenanjo, 1978:12) points out, do not allow downstep in underived disyllabic nouns. Consider the tonal structure in Table 4 as follows:

**Table 4:** Lexical H.H tone class in Èwùlù

| | | | | |
|---|---|---|---|---|
| **/égó/** | → | **[égó]** | 'money' | *é!gó |
| **/ɔ́nó/** | → | **[ɔ́nṍ]** | 'mouth' | *ɔ́!nó |
| **/ísí/** | → | **[ísí]** | 'head' | *í!sí |
| **/álɔ́/** | → | **[álɔ́]** | 'abomination' | *á!lɔ́ |
| **/énú/** | → | **[énṹ]** | 'top' | *é!nú |
| **/ɔ́lɔ́/** | → | **[ɔ́lɔ́]** | 'work' | *ɔ́!lɔ́ |



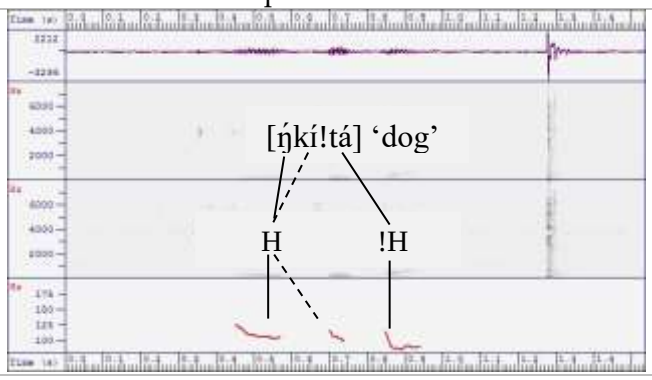

As the forms in Table 4 and the acoustic image of [égó] *'money'* show, underlying and surface H.H tone melodies assume a 'levelled' pitch structure, reflecting *H-spread,* in which the initial H-toned <110Hz> syllable spreads across to the second one <108Hz>. The decrease in Fundamental Frequency (F0) associated with [ó] as opposed to that associated with [é] appears to be the effect of pitch declination which occurs as the articulators are relaxed at the end of utterance.

### 5.1.2 Underived H.H.H Tone Melody

Multiple Hs can be borne by unrestricted number of underived noun words in Èwùlù. From data, Èwùlù has two categories of HHH tone class: first, the one that attracts final H tone downstepping. Second, that which blocks final H tone downstepping. In this latter case, H tone spread to entire syllables. The following examples in Table 5 and 6 together with their acoustic (F0) correlates illustrate the two cases respectively:

**Table 5:** Lexical H.H.H tone class with downstep in Èwùlù

| | | | |
|---|---|---|---|
| **/ḿkítá/** | → | **[ŋ́kí!tá]** | 'dog' |
| **/ífélé/** | → | **[ífé!lé]** | 'shame/shyness' |
| **/óbélé/** | → | **[óbé!lé]** | 'little' |
| **/átóló/** | → | **[átó!ló]** | 'sheep' |
| **/áβókó/** | → | **[áβó!kó]** | 'shoe(s)' |
| **/ḿβóló/** | → | **[ḿβó!ló]** | 'seed/fruit' |



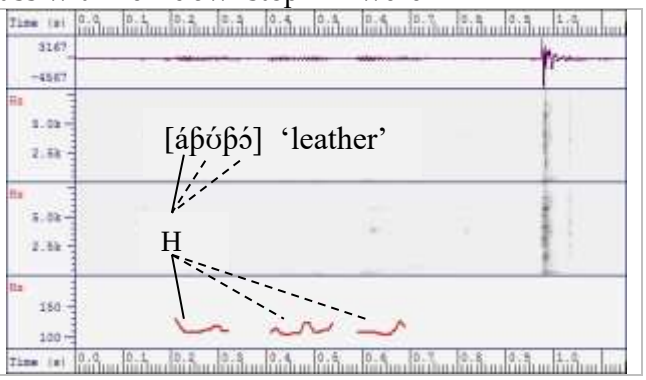

As demonstrated in Table 5, citing the first example [ŋ́kí!tá] 'dog', evidence of final H downstepping, triggered by an underlying floating L, is laid bare in the pitch track. The F0 of the final H is relatively lower than those of the preceding Hs. The F0 of the final H is concentrated at

around 90Hz while the first-two Hs are concentrated at approximately 103Hz and 99Hz respectively.

In Table 6, however, the structure is entirely different. Here the lexically determined tripartite tone structure simply displays 'H-spread' effect that spans the entire syllables similar to that demonstrated in Table 5. Their F0s range between 125Hz to 126Hz, citing the acoustic cue of [áβúβɔ́] 'leather', in illustration of the melodic spread of Hs:

**Table 6:** Lexical H.H.H tone class with null downstep in Èwùlù

| | | | | |
|---|---|---|---|---|
| **/áβúβɔ́/** | → | **[áβúβɔ́]** | 'leather' | ***áβú!βɔ́** |
| **/ósísí/** | → | **[ósísí]** | 'stick' | ***ósí!sí** |
| **/ákíkɔ́/** | → | **[ákíkɔ́]** | 'tale' | ***ákíkɔ́** |
| **/áfófó/** | → | **[áfófó]** | 'suffering' | ***áfó!fó** |
| **/ɔ́βúβú/** | → | **[ɔ́βúβú]** | 'bone' | ***ɔ́βú!βú** |
| **/ɛ́ʃúʃú]/** | → | **[ɛ́ʃúʃú]** | 'snake' | ***ɛ́ʃú!ʃú** |

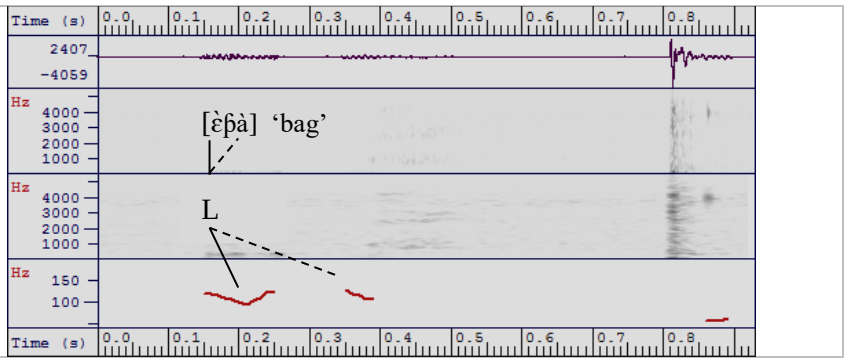



### 5.1.3 Underived L.L Tone Melody

Like the H tone, the L can spread over entire syllables, as the forms and the F0 contours displayed in the pitch track in Table 7 demonstrate:

**Table 7:** Lexical L.L tone class in Èwùlù

| | | | |
|---|---|---|---|
| **/ɛβà/** | → | **[ɛβà]** | 'bag' |
| **/ɔ̀jì/** | → | **[ɔ̀jì]** | 'friend' |
| **/m̀pì/** | → | **[m̀pì]** | 'horn' |
| **/ò̩wà/** | → | **[ò̩wà]** | 'world' |
| **/ìtè/** | → | **[ìtè]** | 'pot' |
| **/òpì/** | → | **[òpì]** | 'trumpet' |



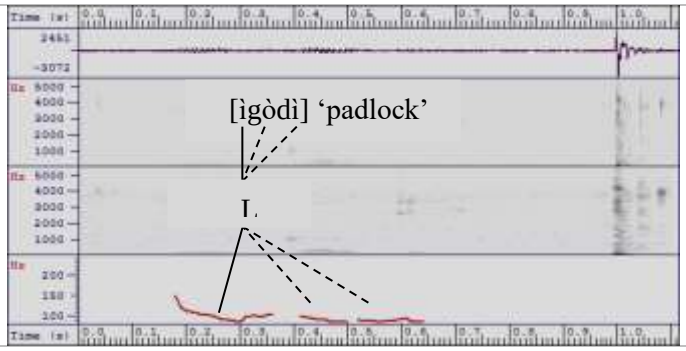

Acoustic cue clearly shows the spread, citing the first example, [ɛβà] 'bag'. Essentially, the F0s of the initial L and final L concentrate at around 120Hz. Multiply Ls in nouns are also possible, as would be illustrated in the next section.

### 5.1.4 Underived L.L.L Tone Melody

The L displays similar structure like that of the H exemplified in Table 6. Some nouns do have three consecutive Hs, spreading across the entire trisyllable. The L.L.L tone melody in nouns is shown in Table 8as follows:

**Table 8:** Lexical L.L.L tone class in Èwùlù

| | | | |
|---|---|---|---|
| **/ìgòdì/** | → | **[ìgòdì]** | 'padlock' |
| **/àɲìŋà/** | → | **[àɲĩŋã̀]** | 'horse/ass' |
| **/ùgèɓè/** | → | **[ùgèɓè]** | 'mirror' |
| **/m̀ɓàdà/** | → | **[m̀ɓàɗà]** | 'antelope' |
| **/àgìnì/** | → | **[àgìnĩ̀]** | 'mat' |
| **/àkɔ̀nà/** | → | **[àkɔnã̀]** | 'prostitution' |

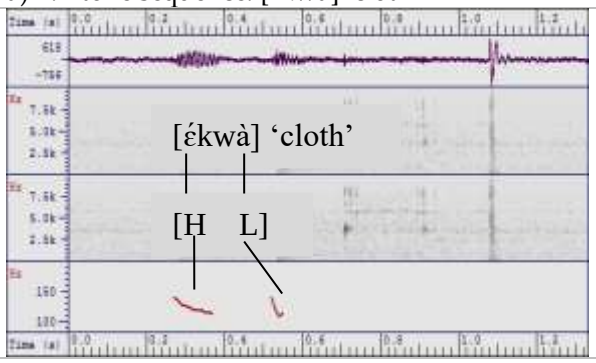
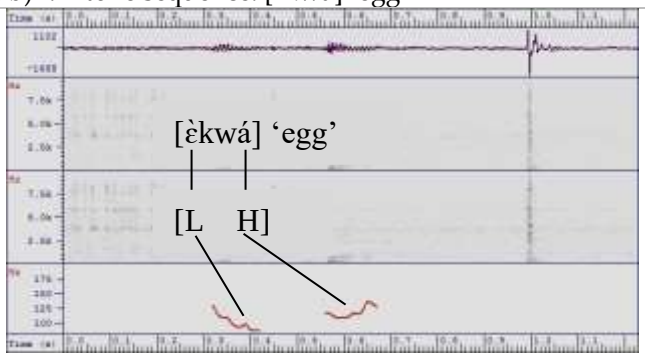



Acoustic cue sheds light on the L-spread in (8) illustrated in the word, [ìgòdì] 'padlock'. TheL-spread is captured in the pitch track, <89Hz>, associating from the left to the right of the string.

### 5.1.5 Assimilatory Effects in Underived Tone Melodies in Èwùlù Nouns

Tone assimilation is a common suprasegmental phenomenon in languages that make use of lexical tones. As a tone language, Èwùlù level pitch contours may be lowered or raised under the influence of some adjacent tone. Though such assimilatory effects are not quite salient auditorily, acoustic input helps provide evidence that such phonetic tonal assimilation process actually occur. For instance, it is a different structural scenario altogether when a H is followed by a L as opposed to when a L is followed by a H. In converse cases, the F0 contours assume different dimensions of pitch variations, as validated in minimal pairs [ɛ́kwà] 'cloth' vs. [ɛ̀kwá] 'egg' in Table 9a and Table 9b respectively:

**Table 9:** Lexical tone assimilation in Ewùlù: bisyllabic noun words

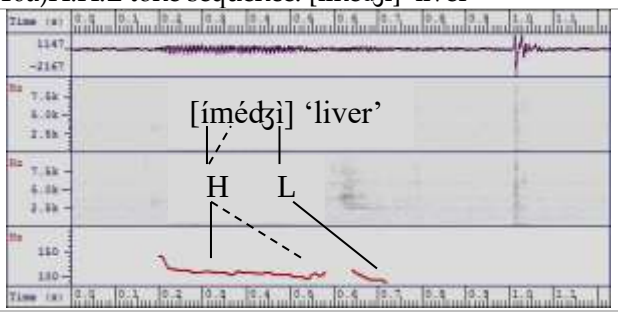
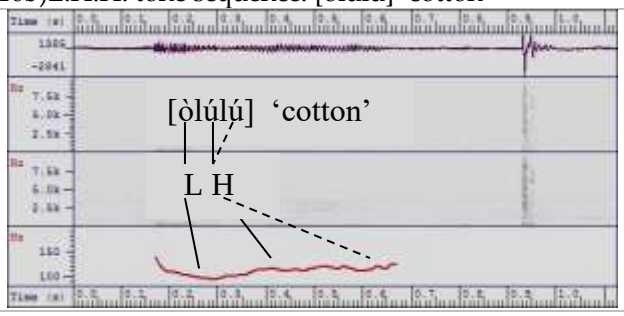
| (9a)H.L tone sequence: [ɛ́kwà] 'cloth' | (9b)L.H tone sequence: [ɛ̀kwá] 'egg' |
|---|---|
|  |  |



The acoustic signal in Table 9a& Table 9b indicates that the H followed by a L peaks at about 140Hz and falls at 112Hz while the H preceded by a L rises from 116Hz and peaks at about 135Hz. This suggests that the pitch range of the H can be varied depending on whether it is followed or preceded by a L.

Further evidence of phonetic-based assimilatory effect on lexical tones by neighbouring tone is revealed in the following possible lexical sequences H.H.L vs. L.H.H and L.H.L vs. H.L.H specified for the Ewùlù words, íméjì 'liver' vs. òlúlú 'cotton' and ònúgbù 'bitter leaf' vs. ígbòdó 'a town' in Table 10a and Table 10b respectively:

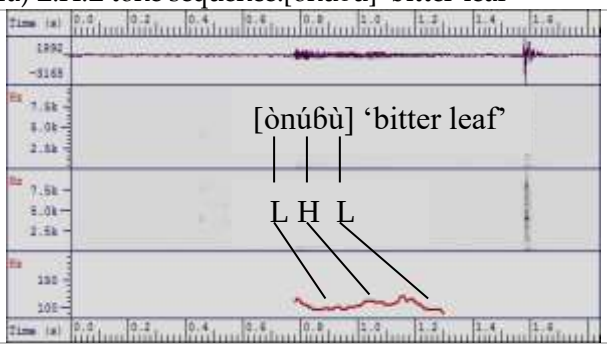
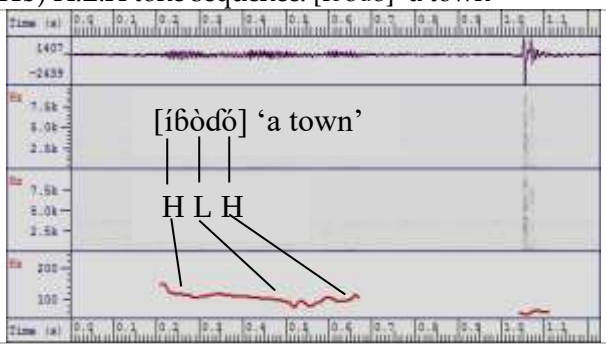
**Table 10:** Lexical tone assimilation in Èwùlù: trisyllabic noun words

| (10a)H.H.L tone sequence: [ímédʒì] 'liver' | (10b)L.H.H. tone sequence: [òlúlú] 'cotton' |
|---|---|
|  |  |



As the contours in Table 10a& 10b show, evidence of H-spread in Table 10a is depicted by a near parallel pitch track. In Table 10b however, the spread begins second halfway the entire syllables and terminates at the end of the unit. Precisely, the consecutive Hs in Table 10a and Table 10b have 110Hz-107Hz and 113Hz-114Hz respectively. The slight disparity in F0s of the Hs in Table 10a and Table 10b can be attributed to the assimilatory effect of the respective adjacent L which lowers pitch range of adjacent Hs. Similar natural phonetic tone rule is recorded in Table 11 as follows:

**Table 11:** Lexical tone assimilation in Èwùlù: trisyllabic noun words

| (11a) L.H.L tone sequence:[ònúɓù] 'bitter-leaf' | (11b) H.L.H tone sequence: [íɓòɗǒ] 'a town' |
|---|---|
|  |  |



Like in Table 10, the examples in Table 11, particularly the one in Table 11(a) exhibits a tonal phenomenon referred to as 'downdrift', or alternatively, 'automatic downstep' (Stewart, 1965). The tonal phenomenon has been defined as, "*a sequential process whereby high tones after low tones become progressively less high throughout an intonational unit*" (Crystal, 2008:157). The phenomenon, which is operative in the Table 10a and Table11a example, is interpreted here as 'lexical downdrift', since it operates within underived noun words.

Comparatively, the automatic downstepped H in Table 10a [mé] in [í**mé**dʒì] 'liver' and Table 11a, [nú] in [ò**nú**ɓù] 'bitter leaf' records the lowest F0, 107Hz and 104Hz respectively, apparently lowered by the final L. The uneven F0s can be attributed to the fact that [mé] is preceded by a H and [nú] by a L. Nonetheless, the F0s of the Hs in positions other than this are concentrated around 110Hz and 115Hz. Besides, as expected, final Ls record the lowest F0. The final syllables, [dʒì] and [ɓù], in [ímédʒì] *'liver'* and [ònúɓù] *'bitter leaf'*, record 90Hz and 95Hz respectively. The variability appears to be motivated by decrease in the rate of vibration of the vocal folds as the utterance progressively ends.

At the interface between phonology and syntax is also the operation of F0 fluctuations in the tonology of the lect. The pitch contour fluctuations occur when nouns are combined to form phrases. The fluctuations are examined in the following (sub) sections.

### 5.2 The Structure of Derived/Grammatical Tone Melodies in the Èwùlù Noun

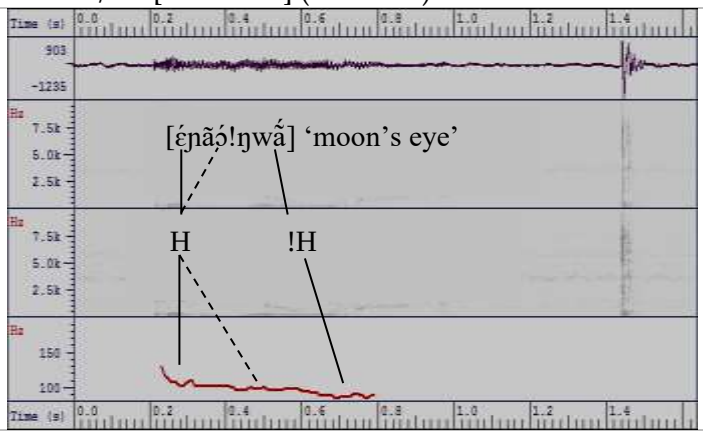
Variety of tone alternations are attested in Èwùlù whenever two noun words are combined to form phrases in what (Hyman, 2007) tags 'associative construction', or 'noun-noun' construction (Welmers, 1959). However, a number of cases are noticed in the Èwùlù data where surprisingly no tonal change occurs in spite of such combination. Such syntactically motivated tone rules wide spread in central Igbo and other Niger/Benue Congo languages are examined below.

### 5.2.1 Tone Alternations in Èwùlù Noun-Noun Construction: Pattern I

In this section, the following Èwùlù one sequences, H.H + H.H, H.H + H.H.H, (H).H + H.H!H, H.H + L.H!H, as they relate to the H melody are examined. To begin with, the associative H.H + H.H combination is considered. Once juxtaposed with each other, the rightmost Hs are saliently perceived to change in melody, while their leftmost counterparts unchanged. The changes take either of the following two patterns: Pattern (I):/H.H+H.H/ becomes [H.H.H.**!H**], while in pattern (II): the same /H.H+H.H/ turns to [H.H.H.**L**].

**Table 12:** (Èwùlù /H.H + H.H/ → [H.H.H!H] (Pattern I)

| | | | | |
|---|---|---|---|---|
| **/ɛ́ŋá/** 'eye' | + | **/ɔ́ŋwá/** 'moon' | → | **[ɛ́ŋã̀ɔ́!ŋwã́]** 'moon's eye' |
| **/ísí/** 'head' | + | **ókwú** 'word' | → | **[ísió!kwú]** 'word's head' |
| **/ókwú/** 'word' | + | **/égó/** 'money' | → | **[[ókwué!gó]** 'money matter' |
| **/ókwɔ́/** 'leg' | + | **/éɓé/** 'hawk' | → | **[ókwɔé!ɓé]** 'hawk's leg' |
| **/ánɔ́/** 'meat' | + | **/éɓé/** 'hawk' | → | **[ánɔé!ɓé]** 'hawk meat' |




NB: Èwùlù is a V¹ dominant lect, once it deletes, or glides to [j] or [w] to resolve hiatus (Utulu, 2006), its tone is lost. The segmental rules meant to resolve hiatus overtly affect the tone borne by the elided segment, particularly if the following melody is identical to the lost tone. However, for clarity of analysis, underlying V¹ that is subjected to deletion/glide formation rule is typographically retained here and elsewhere, though acoustic cue-cum-association lines are provided to capture the overt prosodic structure.

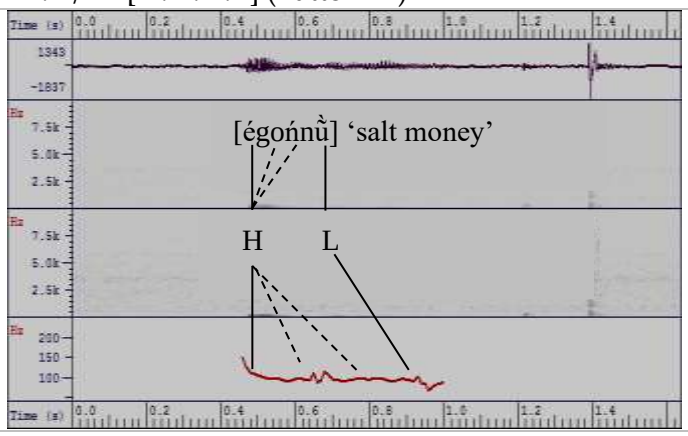
As Table 12 depicts, only the rightmost H.H melody that is modified to H.!H, where the derived final H is downstepped. Instrumental validation of the pattern is shown in the adjoining column, citing the first example, [ɛ́ŋã̀ɔ́!ŋwã́] 'moon's eye'. As the pitch contours show, the final H <84Hz>, records the lowest F0, an indication of the effect of the unassociated grammatical floating L tone. F0s of the first-two Hs record 107Hz and 100Hz respectively.

A rather different scenario quite unique to Èwùlù is posed in Table 13. Here, the supposedly final !H is lowered to a L, yielding a [HL] rather than [H!H] sequence. Instrumental validation of the auditory perception of this phenomenon shows up in the adjoining pitch track

in Table 13. The phonological motivation for the lowering of final H tone rather than downstepping it, as is the case in many eastern and western varieties of Igbo is unclear. The pattern is shown in Table 13 as follows:

**Table 13:** Èwùlù /H.H + H.H/ → [H.H.H.L] (Pattern II)

| | | | | |
|---|---|---|---|---|
| **/égó/** ‘money’ | + | **/ńnú/** ‘salt’ | → | **[égońnṵ̀]** ‘salt money’ |
| **/ílé/** ‘tongue’ | + | **/ánó/** ‘animal’ | → | **[íleánṍ]** ‘animal tongue’ |
| **/ɔ́ŋá/** ‘sore’ | + | **/ísí/** ‘head’ | → | **[ɔ́ŋãísì]** ‘head’s sore’ |
| **/ḿbɔ́/** ‘nail | + | **/ɛ́ká/** ‘hand’ | → | **[ḿbɔɛ́ká]** ‘hand’s nail’ |
| **/ɛ́ká/** ‘hand’ | + | **/ánó/** ‘animal’ | → | **[ɛ́kaánṍ]** ‘animal’s hand’ |



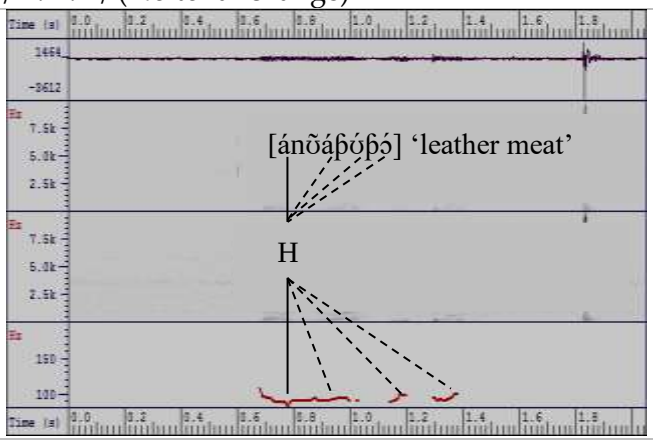

NB: the same hiatus resolution strategies that hold in (12) applies in (13) and elsewhere in this study. Crucially, identical tones typically merge/contract identical melodies. This view is consistent with the tenet of the Obligatory Contour Principle (OCP), (Leben, 1973; Goldsmith, 1999; Myers 1997), which disallows the occurrence of adjacent identical tone melodies in a derivation in tone languages.

As revealed in Table 13 the F0s of the surviving Hs are concentrated around 108Hz, 99Hz and 98Hz respectively while that of the L is around 75Hz.

Meanwhile, the structural pattern posed by H.H + H.H.H noun-noun combination in Table 14 is quite varied when compared to that in Table 13. The initial phrasal syllable H melody of [ánʊ̃́ábʊ́bɔ́] ‘salt money’, taken as a representative of other forms in Table 14 measures <95Hz> spreads across the remaining three Hs whose F0s measure <94Hz, 93Hz and 92Hz>, respectively, as the contours below depict:

**Table 14:** Èwùlù /H.H/ + /H.H.H/ (No tonal change)

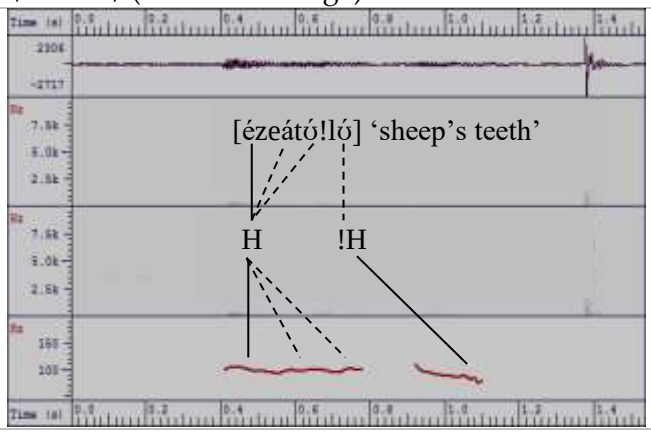
| | | | | |
|---|---|---|---|---|
| **/anó/** ‘meat’ | + | **/áβóβɔ́/** ‘leather’ | → | **[ánõáβóβɔ́]** ‘leather meat’ |
| **/ísí/** ‘head’ | + | /ɛkwókwɔ́/ ‘book’ | → | **[ísiɛ́kwókwɔ́]** ‘book head’ |
| **ókwó** **‘**leg’ | + | **/ɛʃóʃɔ́/** ‘snake’ | → | **[ókwɔɛʃóʃɔ́]** ‘snake’s leg’ |
| **/ísí/** ‘head’ **/ílé/** ‘tongue’ | + | **/érírí/** ‘rope’ **/ɛʃóʃɔ́/** ‘snake’ | → | **[ísiérírí]** ‘rope head’ **[íleɛʃóʃɔ́]** ‘snake tongue’ |




Moreover, as in Table 14, the surface (H).H + H.H!H sequence of the forms in Table 15 stays faithful to the underlying melody, with their respective final !H preserved. The H spread is concentrated at about 100Hz, with that of the downstepped H measuring 84Hz, as shown below:

**Table 15:** Èwùlù /(H).H/ + /H.H!H/ (No tonal change)

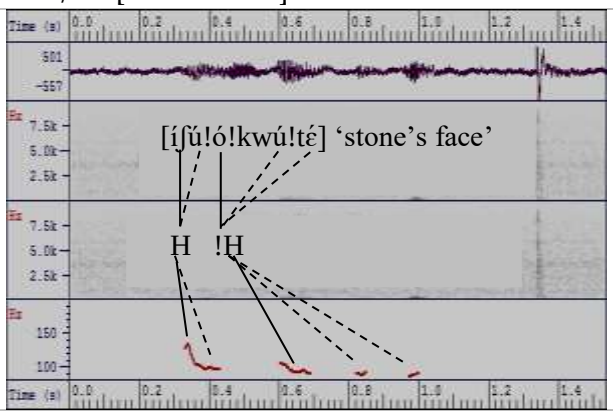
| | | | | |
|---|---|---|---|---|
| **/ézé/** ‘teeth’ | + | **/átó!ló/** ‘sheep’ | → | **[ézeátó!ló]** ‘sheep’s teeth’ |
| **/ɛ́fɔ́/** ‘stomach’ | + | **/ágí!zí/** ‘fly’ | → | **[ɛ́fɔágí!zí]** ‘fly’s stomach’ |
| **/ńrí/** ‘food’ | + | **/mβó!ló/** ‘seed’ | → | **[ńrimβó!ló]** ‘seedy food’ |
| **/ísí/** ‘head’ | + | **/ájní!ké/** ‘axe’ | → | **[ísiájní!ké]** ‘axe head’ |
| **/ŋwá/** ‘chid’ | + | **/ífé!lé/** ‘shyness’ | → | **[ŋwaífé!lé]** ‘shy child’ |




However, if a L rather than a H begins the initial syllable of the rightmost trisyllabic word, as the forms in Table 16 show, the L is raised to a H in anticipation of the following H. The H is subsequently downstepped, in anticipation of the final !H that then creates a kind of ‘downstep spread’. This sort of tone displacement/downstep spread appears unique to Èwùlù. The pattern is captured below:

**Table 16:** Èwùlù /H.H/ + /L.H!H/ → [H.H!H!H!H]

| | | | | |
|---|---|---|---|---|
| **/ísú/** ‘face’ | + | **/òkwú!tɛ́/** ‘stone’ | → | **[ísú!ó!kwú!tɛ́]** ‘stone’s face’ |
| **/ókwó/** ‘leg’ | + | **/m̀gwé!lé/** ‘lizard’ | → | **[ókwṍ!ŋ!gwé!lé]** ‘lizard’s leg’ |
| **/ɛ́ká/** ‘hand’ | + | **/m̀ʃí!kɔ́/** ‘crab’ | → | **[ɛ́kā́!ɲ!ʃí!kɔ́]** ‘crab’s hand’ |
| **/ódʒɔ́/** ‘fear’ | + | **/àɓá!lá/** ‘thunder’ | → | **[ódʒɔ́!áɓá!lá]** ‘thunder fright’ |
| **/ɔ́nó/** ‘mouth’ | + | **/m̀mí!rí/** ‘water’ | → | **[ɔ́nṍ!m̀!mí!rí]** ‘saliva’ |

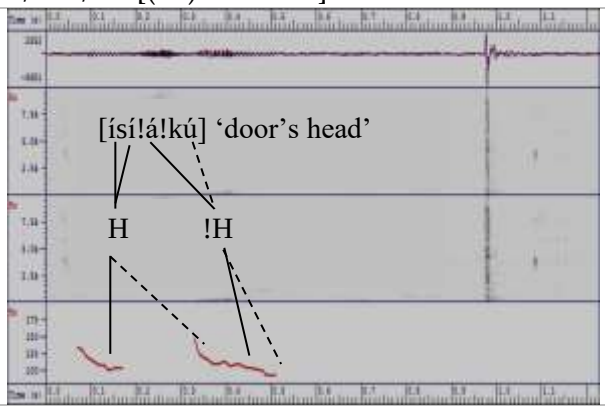



It is interesting to note that the H-spread measures about 107Hz while the !H-spread measures about 87Hz, though transitions of the initial !H begin with a higher F0, around 103Hz. This can be attributed to H spread effect emanating from the preceding Hs.

Similar tone displacement occurs quite frequently with the (H.)H.H + **L**.H sequence becoming [(H.)H.H!H!H], where the L is raised to !H (progressive raising) and the final H is lowered to !H, as the examples in Table 17 show:

**Table 17:** Èwùlù /(H.)H.H/ + /L.H/ → [(H.)H.H!H!H]

| | | | | |
|---|---|---|---|---|
| **/ísí/** 'head' | + | **/àkú/** 'door' | → | **[ísí!á!kú]** 'door's head' |
| **/ísí/** 'head' | + | **/ǹtú/** 'nail' | → | **[ísí!ńt!ú]** 'nail's head' |
| **/íké/** 'power' | + | **/òbí/** 'king' | → | **[íké!ó!bí]** 'king's power' |
| **/ɔ̀ɓóɓó/** 'bone' | + | **/òké/** 'rat' | → | **[ɔ̀ɓóɓó!ó!ké]** 'rat's bone' |
| **/ɛ̀fɔ́/** 'stomach' | + | **/ùʤú/** 'Uju' | → | **[ɛ̀fɔ́!ú!ʤú]** 'Uju's stomach' |




In Table 17, the lexical L tone melody is raised to surface !H while the final H melody is lowered to !H. The surface melodies progressively measure 112Hz, 109Hz, 98Hz and 93Hz.

In the cases explored so far, in which the leftmost tone melodies are (H).H, it will be observed that the lect has a tonal restriction that ensures that only the tonal melodies on the right of the derivation are modified, as is typical of tone languages. In the next section, the same restriction is shown to hold even when leftward melodies are /L.L/ sequence.

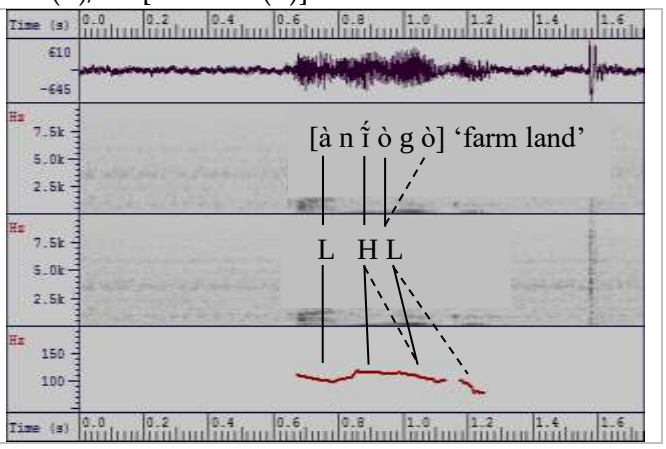
### 5.2.2 Tone Alternations in Èwùlù Noun-Noun Construction: Pattern II

In pattern II, phrasal initial L.L in combination with a number of varied tonal sequences generates quite a number of left-ward grammatical tone alternations consistent with the rightward mapping of tone melodies in tone languages (Goldsmith, 1976; Yip, 2002).

The first consideration is the well known underlying sequence, /L.**L**$^{H}$+ **L**.L.(L)/ which alternates to [L.H.**L**.L.(L)] or [L.**L**.**H**.L.(L)], where the intervening 'floating' underlying H, a tonal affix/associative morpheme, as it is called (Clark, 1990, Hyman, 2007), displaces the right or left boundary L tones in many tone languages, e.g. Igbo(id) and Edo(id) (Hyman, 1975; Emenanjo, 1978; Elimelech, 1976; Williamson, 1986). This prototype occurs quite frequently in Èwùlù strings, as the forms in Table 18 show:

**Table 18:** Èwùlù /L.L/ + /L.L.(L)/ → [L.H-L.L.(L)]

| | | | | |
|---|---|---|---|---|
| **/ànì/** 'land' | + | **/ògò/** 'farm' | → | **[ànǐ̀ògò]** 'farm land' |
| **/àkwà/** 'bed' | + | **/ǹdìdì/** 'a name' | → | **[àkwáǹdìdì]** Ndidi's bed' |
| **/ǹtì/** 'cheek' | + | **/m̀ɓàɗà/** 'antelope' | → | **[ǹtím̀ɓàɗà]** 'antelope's cheek' |
| **/ǹkù/** 'feather' | + | **/ɔ̀gàzù/** 'guinea fowl' | → | **[ǹkúɔ̀gàzù]** 'guinea fowl's feather' |
| **/àɓà/** 'jaw' | + | **/èŋwè/** 'monkey' | → | **[àɓáèŋwè]** 'monkey's jaw' |



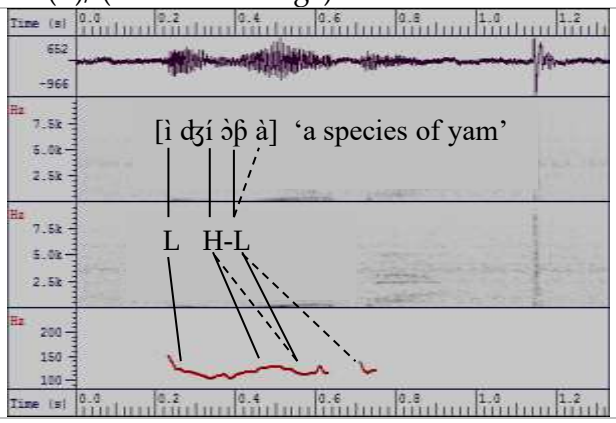
In Table 18, evidence of the tonal affix (floating grammatical H) is shown in the adjoining instrumentation, measuring <118Hz). The fact is captured in the pitch track as a rise after the initial L, citing the example, [ànr̂ɔ̀gò] 'farm land'.

As pointed in the foregoing, the context of operation of the associative morpheme is clear and predictable: the /…**L** + **L**…/ sequence. In Èwùlù, this underlying sequence is simply turned to surface [L.**H-L**.L.(L)], where the tonal affix re-affiliates to the following L consequent upon the gliding/deletion of its $V^1$, [ɪ̀] in [ànɪ̀] and the final [a] in [àɓà] to form a falling contour tone [H-L], as [ànjɔ̂gò] and [àɓêŋwè] 'monkey's jaw respectively reveal. Of interest here is the tonal structure of the phrasal initial L whose F0 is relatively higher than other final Ls in the example cited in the acoustic representation in Table 18. The initial L records <107Hz>, while the final Ls record 101Hz and 81Hz respectively. The peak of the initial L contour can be viewed as 'anticipatory L raising' triggered by the following floating H tone.

The tonal structure captured in Table 18 is mutable, as the forms in Table 19 demonstrate. In Table 19, the tonal affix becomes 'undetectable' once the target left or right boundary L tone is specified with a H, as in /L.**H** + L.L.(L)/ or /L.L + **H**.L(L)/ sequence. Once this is the case, the floating H tone is altogether dislodged in obedience to the tonal OCP which ensures that any two adjacent tonemes must not be identical but distinct, as Table 19 depicts:

**Table 19:** Èwùlù /L.H/ + /L.L.(L)/ (No tonal change)

| | | | | |
|---|---|---|---|---|
| **/ìʤí/** 'yam' | + | **/ɔ̀ɸà/** 'specie' | → | **[ìʤíɔ̀ɸà]** 'species of yam' |
| **/òbí/** 'king' | + | **/èwùlù/** 'a town' | → | **[òbíèwùlù]** 'king of Ewùlù' |
| **/àzɔ́/** 'back' | + | **/m̀ɓàɗà/** 'antelope' | → | **[àzɔ́m̀ɓàɗà]** 'antelope's back' |
| **/ùɗé/** 'pomade' | + | **/àkɔ̀nà/** 'harlot' | → | **[ùɗéàkɔ̀nà]** 'harlot's pomade' |
| **/ɛ̀kwá/** 'egg' | + | **/ùɗènè/** 'vulture' | → | **[ɛ̀kwáùɗènè]** 'vulture's egg' |



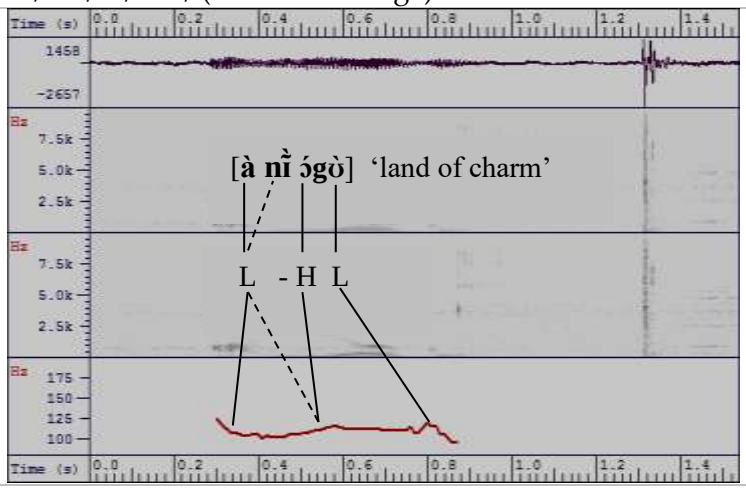

As can be seen, the surface tonal melody in the forms in Table 19 remains faithful with its abstract counterpart, with the tonal affix totally effaced in avoidance of violation of the tonal OCP. It is not mere coincidence then why surface contour (see acoustic image in (19)) exhibits only one pitch rise representing one level H rather than two. The derived H tone measures <127Hz>, relatively higher than the initial L and the final two Ls, measuring <108Hz>, <118Hz> and <118Hz> respectively.

Accordingly, the relatively higher F0 for the final two L resulting in L raising effect can be ascribed to the 'progressive spread' of the preceding H melody. Evidently, like the pattern in (18), this structure automatically creates a falling contour tone [H-L] once $V^1$ glides or deletes on the operation of hiatus resolution strategy, yielding the final surface forms, [ìʤjɔ̂ɸà] 'a species of yam' and [ùɗa̰kɔ̀nà] 'harlot's pomade'.

In Table 20 the same structural cause holds. In this case, H tone is specified for the initial syllable of the head of the noun phrase, thus:

**Table 20:** Èwùlù /L.L/ + /H.L/ (No tonal change)

| | | | | |
|---|---|---|---|---|
| **/ànì/** 'land' | + | /ɔ́gò/ 'charm' | → | **[ànǐɔ́gò]** 'land of charm' |
| **/ɛ̀ɓà/** 'bag' | + | **/útʃè/** 'Uche' | → | **[ɛ̀ɓàútʃè]** 'Uche's bag' |
| **/àɓà/** 'jaw' | + | **/ázò/** 'fish' | → | **[àɓáàzò]** 'fishes' jaw' |
| **/ítè/** 'pot' | + | **/ɔ́ʃù/** 'slave' | → | **[ìtèɔ́ʃù]** 'slave's pot' |
| **/ítè/** 'pot' | + | **/ɔ́kà/** 'maize' | → | **[ìtèɔ́kà]** 'maize port' |




As acoustic impression in Table 20 illustrates, the L-spread concentrated around <107Hz> is captured in the pitch track. The rise <116Hz> and subsequent fall in melody <96Hz> is expressed as well. Given the acoustic cue, there is a melodic effect of relinking the second L of the phrasal initial noun to the right. Consequently, a rising contour tone, [L-H] is generated, a by-product of $V^1$ glide formation/ deletion triggered to resolve vowel hiatus. Thus, after the relevant segmental rule has taken effect, the final output of the forms, [ànɪ̃ɔ́gʊ̀], 'land of charm and [ɛ̀ɓàútʃè] 'Uche's bag', will be [ànjɔ̌gʊ̀] and [ɛ̀ɓʊ̌tʃè]. Tone structures of Èwùlù noun-noun construction are quite diverse, but for want of space, they are left to be explored in future research.

## 6. Conclusion

This study has shed light on the structures of underived and derived tones in Èwùlù nouns. It has demonstrated that lexical tones in Èwùlù, as in many Benue Congo languages (central Igbo inclusive), characteristically change their melodies in isolated words by the rule of vertical assimilation (Hyman, 1975). Consequently, a H may lower in pitch under the influence or an adjacent L. Conversely, a L may raise in pitch under the influence of an adjacent H. The study has also showed that the widespread downstepping of final H in underlying /HH/ sequence in central Igbo and its numerous dialects is not attested in Èwùlù. The SFS/WASP computerised speech laboratory used in the reading of the fundamental frequencies (F0s) of the tones provided acoustic/visual cue to validate the structural changes examined in the work.

Moreover, in the concatenation of two noun words in the formation of phrases, also known associative construction, level H or L typically changed, subject to possible combination of tone sequences. In the associative constructions explored, only tones of rightward noun elements changed. Such tonal alternation includes but not limited to the following: final H tone downstepping and final H tone lowering. The latter is quite rare in central Igbo which favours downstepping in this domain.

Others tonal processes include tone displacement in which surface grammatical tones are remarkably different from their underlying forms and the displacement of three underlying Hs to consecutive surfaced downstepped Hs, a yet another rare tonal structure in the central variety.

Significantly, the study has shed light on the patterning of lexical and grammatical tones from a geo-dialectal perspective, from the point of view of Igbo tone phonology.

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