

AN AUTOSEGMENTAL ACCOUNT OF GLIDES IN IGBO TONOLOGY

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Abstract

For several decades, scholars have tried to develop theories that can account for phonological issues in human language. The autosegmental phonology model of Goldsmith (1976) is one of such theories. Igbo is a register tone language where tones are essentially level (Anagbogu, Mbah and Eme, 2001: 97). There are three tones in Igbo – high tone represented with an acute accent /´/, low tone represented with grave accent /`/ and down-step tone represented with a macron /¯/ orthographically and a down arrow, followed by an acute accent /˘´/ phonemically. Igwe (1975) observes that in speech, these tones tend to be phonetically motivated to glide in Igbo. To Eme (2008), this phenomenon is an evidence of a lengthened vowel or two identical vowels with contrasting high and low pitches, while Mbah and Mbah (2010) describe it as being a result of ‘graphological elision’. This paper agrees with Igwe (1975) and uses the autosegmental phonology model of Goldsmith (1976) to account for this kind of behaviour. The tone gliding in Igbo manifests in two ways – rising tone /˘´/ and falling tone /˘`. It occurs in speech in the language when two adjacent identical vowel sounds or lengthened vowel sounds are not of the same pitch. This paper has demonstrated that in addition to the descriptive approach usually adopted in past literature in describing tones in Igbo, autosegmental phonology model has conveniently handled the issue of glides in Igbo tonology. It is certainly an improvement on the past studies and a challenge to study other aspects of Igbo phonology using the autosegmental phonology model.

1. Introduction

A lot has been discussed about tones in Igbo. According to Ogonnaya

(1975), Igbo has three distinct tones – the high tone, the low tone and the mid tone (also called down-step tone) (Igwe, 1975). These tones are phonemic and play very important role in the language in differentiating both lexical and grammatical meanings.

In an attempt to discuss what happens to tones in the Igbo language when they appear in company in speech, some past studies including Igwe (1975) and Ogbonnaya (1975) have submitted that tones tend to glide in Igbo. Emenanjo (1987:3) has also later observed that when two adjacent vowels are of the same pitch and the first is a close vowel, the two vowels are realised with one tone, while the first vowel is realized as a semi-vowel. What happens when the two adjacent vowels are not of the same pitch? This question can better be answered with a multi-linear phonological analysis, where features are represented on separate tiers. In this paper, an attempt is made to present tone gliding in Igbo using the autosegmental phonology model of Goldsmith (1976). It has through this model accounted for why tones glide in the Igbo language not minding that Igbo is a register tone language with three identified distinct tones. The glides are phonetically motivated and occur when two adjacent identical vowels are not of the same pitch or a high close vowel glides to semi-vowel resulting in association of its tone to the next tone-bearing unit.

The data used were gotten from Umuolum dialect of Igbo. Umuolum dialect is spoken in Umuolum community in Ayamelum Local Government Area of Anambra State, Nigeria. It belongs to the East Niger Group of Dialects (ENGD) following Nwaozuzu's (2008) classification. In representing tones, the researcher has adopted the Green and Igwe (1963) tone-marking convention of leaving high tone unmarked, marking low tone with grave accent / ` / and down-step tone with a macron / - / orthographically and a down arrow, followed by an acute accent / ↓ ´ / phonemically. However, for clarity, the convention is limited to examples provided by the researcher only as tones are marked in the examples from other scholars are they represent them.

2. An Overview of Autosegmental Phonology Model

The autosegmental phonology model was enunciated by Goldsmith (1976). It is one of the approaches to generative phonology, but however differs sharply from the generative phonology by its 'development of a multi linear phonological analysis where features may be placed on separate tiers with various tiers organized by 'association lines' and Well-Formedness Condition; and analysis of phonological phenomena less in

terms of feature changing rules as such, and more in terms of rules that delete and organize the various autosegments, through the readjustment of the association lines' (Goldsmith, 1979).

Goldsmith (1979) presents some objectives of the autosegmental phonology model thus:

- i. To deal with the consequences for generative phonology of multi linear phonological analysis and representation.
- ii. To solve the problem of 'stability'.

For (i.) above, before the advent of the autosegmental phonology, phonological and phonetic representations were assumed to consist of a single string, or a concatenation of segments (Goldsmith, 1973, 1974, 1976, 1979). Goldsmith states that the model goes contrary to this assumption and sets up underlying and surface forms consisting of parallel strings of segment arranged in two or more tiers, with features distributed over the various tiers in such a way that no feature may appear on more than one tier. He points out that Leben (1973) and Williams (1976) initiate the moves to break away from a strictly linear representation with the generative grammar by suggesting that the representation underlying some particular sequence of 'phonetic' segments could consist of two separate and quite independent sequences of phoneme-type segments; one sequence providing the tonal information and the other sequence containing anything else. Goldsmith, however, faults their proposals for 'feature' (mapping rule), which merges the tonemic and phonemic sequences as well as system of representing a contour as a strictly linear system would and considers the merger as rather too strong.

(1) v v v v

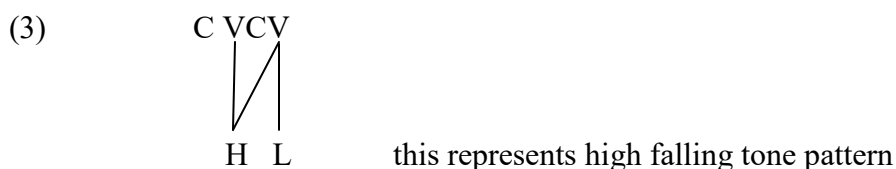
[-high] Co [+high] → [-high] Co [high/ +high]

Goldsmith suggests that the two tiers – the phonemic and the tonemic remain separate throughout the derivation (Goldsmith, 1973:4). He also proposes that rules which have either changes to make or conditions involving both tone and non tone features must likewise be broken up into a tonological and a phonological part (Goldsmith, 1974:4). In place of 'mapping rule', he suggests 'correspondence rule'. He expresses worry on how a single segment could bear or carry two tonal specifications in sequence. He points out the necessity to explain the relationship of left to right ordering inside the segment and the left to right order of segments themselves.

For (ii) above, Goldsmith refers to ‘stability’ as the resistance of the tonal features of a vowel to deletion, even when the vowel bearing the tonal feature is deleted or desyllabified. In order to solve this problem of stability, autosegmental phonology introduces several parallel strings of segments in the phonological and phonetic representations, enriched in a significant way by ‘association lines’, which at the phonetic level indicate the co-registration of different tiers of segments (Goldsmith, 1974:5, 8).



Goldsmith states that a rule that would cause the second syllable to assimilate in tone would modify the above schema and change the relative domain of the tonal and non tonal segments and produce the structure below:



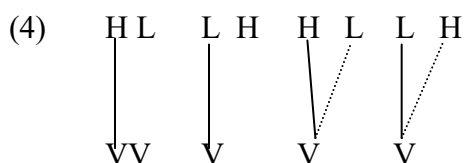
With this analysis, Goldsmith considers the contour toned vowels as those in which the association is not purely one to one; tone spreading rules that give rise to certain kinds of contour tones are the effect of a rule that adds an association line. He sees such rule as one that produces ‘natural’ types of association. He considers the stability of tonal features as the natural consequence of a rule deleting a segment on the tier consisting of non tonal features. He says that two possibilities are open for a language with this kind of autosegmental representation at the underlying representation:

1. The lexical entry for a word may consist of a pair of strings of segments without an association line.
2. Each tier might constitute a separate lexical entry. Thus two ‘morphemes’ may in fact constitute the single underlying phonological level – one on the tonological tier, one on the non tonological tier.

Goldsmith argues that linguists are familiar with this kind of independent minded behaviour as ‘floating tones’ which stand for morphologically identifiable elements (e.g. High tone) whose position with respect to the syllables in the sentence is determined by the syntactic structure and that it is often found in such tone languages that certain syllables are underlyingly devoid of tone, and receive a tone only through the influence of their neighbouring tone-lending syllables. He considers this an underlying ‘mismatch’ between the number of tonal segment and the number of syllabic segments, which can only be dealt with within a more familiar generative approach. He points out that this created the problem of finding out a technical device that relates the two tiers of segments. It is this technical device that Goldsmith calls the ‘association lines’ and states that it might be assumed to be introduced at some points in the derivation by rule after the underlying representation. This leads Goldsmith (1976) to suggest a convention known as ‘the Well Formedness Condition’ (WFC), which has the effect of adding or deleting association lines at any point throughout the derivation (Goldsmith, 1976, 1990). The convention states:

1. Each vowel must be associated with ‘at least’ one toneme.
2. Each toneme must be associated with ‘at least’ one vowel.
3. No association line may cross.

In the opinion of Katamba (1993:158), in line with the Well Formedness Condition, where a tone associated with a vowel is adjacent to another tone that is unassociated with a vowel, a universal convention automatically spreads the tone to the toneless vowels as shown below:



Goldsmith mainly uses this model to deal with tones in Igbo, but points out that it could also be used to deal with other features like nasalization, etcetera (Goldsmith, 1979).

As Mbah and Mbah (2010:117) point out, autosegmental phonology model is an innovative theory. The theory has made great impact in phonology. Goldsmith applies the model in analyzing tones in Igbo. He points out that the preposition *na* which is toneless, cliticizes to its object as shown below:

- (5) a $\acute{O}$ nò ná ùlò ‘he is in the house’
 $\acute{O}$ nò ná àlà ‘it is on the ground’

Autosegmental derivation:

- b i. # #na # ùlò # #
- $\begin{array}{cccccccc} | & | & & | & | & | & | & | \\ \# & \# & \# & H & L & \# & \# & | \end{array}$
- after the association rule
- ii. # # na ù lò # #
- $\begin{array}{ccccccc} | & | & & | & | & | & | \\ \# & \# & HL & \# & \# & & | \end{array}$
- cliticization
- iii.
- $\begin{array}{ccc} | & | & \diagdown \\ | & | & \diagup \\ \# & \# & naùlò \\ & & | & | & | \\ & & \# & \# & | \end{array}$
- after unambiguous correction
- $\begin{array}{ccccccc} \# & \# & & H & L & \# & \# \end{array}$
- (cf Goldsmith, 1974: 10)

Goldsmith (1976) cited in Goldsmith (1979) presents floating tone as accounting for an interesting set of alternations. He points out that the domain of a drop tone is spread over two syllables and considers this situation as being autosegmental rather than segmental assimilation of tonal features.

Through Margi examples, Goldsmith has shown that there are rules that delete segment but which can leave a tone that is associated to the segment unaffected. The examples below and the explanations are as contained in Harrington (2009).

- | | | | |
|-----|-------------------|-----------------|---------|
| (6) | indefinite | definite | |
| | sál | sálàrì | ‘man’ |
| | kátsákár | kátsákàrárì | ‘sword’ |
| | àgám | àgámàrì | ‘ram’ |
| | kùm | kùmàrì | ‘meat’ |

The examples above show that when the indefinite ends in a consonant, there is no change to the definite and the suffix is always [áɾì], but when the indefinite ends in a vowel, there are various changes both to the vowel of the suffix and to its tone.

(7)	indefinite	definite	
	kí	k ⁱ á rì	‘compound’
	kú	k ^w á rì	‘goat’
	tágú	tag ^w á rì	‘horse’
	ḡéré	ḡérè rì	‘court’
	tóró	tórò rì	‘three pence’

The above examples can be handled in a linear SPE model, but there could be a rule that turns a high vowel into a glide when it precedes a vowel, thus [i] and [u] become [j] and [w] respectively and the vowel of the stem replaces the vowel of the suffix elsewhere: thus [tóró +ári] becomes [tóróri], [ʃèré+ári] becomes [ʃèrèri] etc.

Where the indefinite ends in a vowel with a low tone, a high vowel changes to glide and the vowel of the suffix is replaced with the last vowel of the indefinite elsewhere, but the tone of the penultimate vowel also changes from high to rising:

(8) **indefinite** **definite**

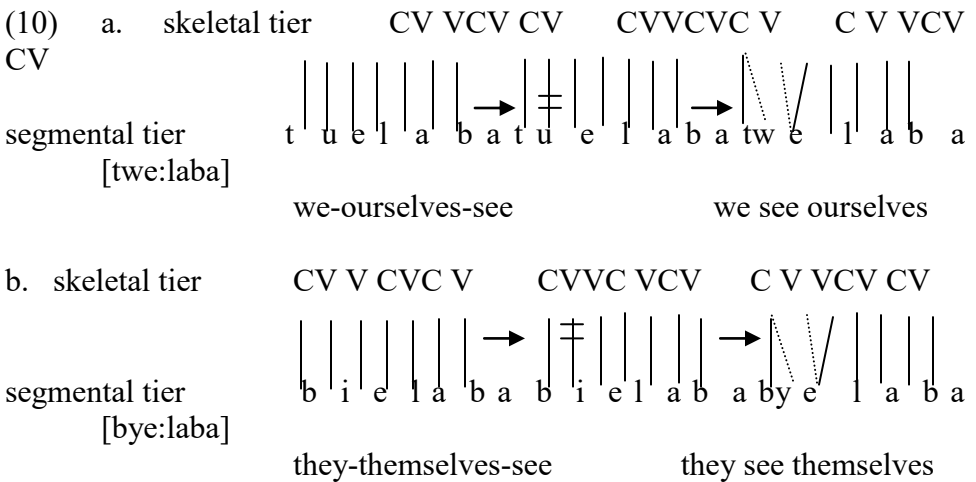
fă	fări	‘farm’
tî	tări	‘mourning’
hù	h ^w ări	‘grave’
cédè	cédări	‘money’

Under the SPE framework, tone would be assumed to be an intrinsic part of the vowel's feature matrix. Therefore, a case such as this would be hard to handle. This is because the tone of the suffix is not deleted even though a closer analysis indicates that the vowel is deleted. [cédàrì] is derived from cédè + árì. When the vowel of the stem is deleted without deleting the tone, we get cédè + ' rì. Now a rule is needed to attach the unattached tone to the nearest vowel such that we get a combination of a low tone followed by a high tone (L and H) which is the same as a rising tone.

(9) Tonal tier L H L L H L L H L
 | | | → | | | → | / |
 | | | | | | |
 Seg. tier f a a r i f a r i f a r i

Through a rule, LH tones are attached to the first vowel thereby deriving [fãri].

Katamba (1993:162) has also applied autosegmental phonology to analyses of Luganda. He observes that in Luganda, if the first of two vowels is high, that is /i/ or /u/, it is not deleted, but is instead associated with C slot to its left and surfaces as a non syllabic glide /y/ or /w/. The first V – slot that is vacated is then taken over by the second vowel, which is ‘lengthened in compensation’.



Clark and Yallop (1999:406) submit thus, “In many tonal languages, a high tone becomes, by anticipatory assimilation, a falling tone when followed by a low tone. If so, this can be shown as the consequence of both the high tone and the low being mapped on to a single syllable.” They had earlier stated that contour tone systems frequently, if not always, include level or near-level tones. This view agrees with Katamba (1993:157) that contour tones are created when independent high and low tones are simultaneously linked to a single vowel (or to a single tone-bearing unit)(Also, see Oostendorp; 2005: 5-7).

Mbah and Mbah (2010: 117) summarises the advantages of autosegmental phonology model in the following way:

- i. It can deal with autosegmental phenomena in isolation, efficiently.
- ii. It can also discuss, efficiently, tone languages.
- iii. It has led to a morphological theory that becomes well equipped to deal with non-concatenative morphological generation especially those involving copying.

3. Glides in Igbo

Despite Igbo being a register tone language, tones sometimes glide (Igwe, 1975; Ogbonnaya, 1975). Igwe (1975) identifies two kinds of glides in Igbo: phonetically-motivated glide and grammatically-motivated glide. He concludes that while phonetically-motivated glides operate between syllables, grammatically motivated glides are restricted to a single syllable. He discloses that phonetically-motivated glides occur when two vowels appear contiguously either in the same word or in juxtaposed words and the second vowel, which constitutes a syllable, is either lower or higher than the one preceding it.

- (11) a. m̀meē ‘blood’, ag’ụō ‘hunger’, nīle ‘all’, ùgbu à ‘now’
 b. l̀eē ‘look’, l̀aa ‘go away’, Ọ z̀t̀àrà az̀ù ‘he bought fish’,
 Ọ l̀òt̀àrà ngwā ‘he/ she came back early’

Grammatically-motivated glides, to Igwe (1975), may be down-glides or up-glides and occur under any of these conditions:

- a. If a word or phrase or clause which functions as the subject in a sentence type of the Simple Sentence Form I has a high final syllable.
- (12) Eghù t̀àrà jì ‘The goat ate the yam’
 akẁukwọ yā` f̀ur̀ù ‘His book got lost’
 ndị byāra ngwā` h̀ur̀ù ya ‘those who came in time saw it’
- b. If the final syllable of a noun or a noun phrase is low and the noun or noun phrase is the head of the relative clause.
- (13) m̀gbě gāra āga ‘in past time’ / ‘time which is past’
 Àlā j̀ur̀ù oyī ‘ground which is cold’
- c. If a verb is the first in a sequence of verbal forms and the one immediately following it has a prefix.
- (14) Ha nāa bya ème yā ‘let them keep coming and doing it’
 Unù gāa ga, unù màkwaa àwò
 ‘If you really wanted to go, you had better start early’

Ogbonnaya (1975) observes the presence of the high falling to low tone and the low rising to high tone, but states that they are grammatical tones as they are not frequent and rarely occur in words in isolation; they occur in words, phrases and clauses where a syllable sort of ‘glides’ into the other during speech.

- | | | | |
|--------|---------------------------|--|---|
| (15)a. | Ònyê chòrò ìtè? | ‘who wants a pot’ | } |
| | Hâ nwèrè ákwúkwó. | ‘they have books’ | |
| | High falling tones | | |
| | Ófê dì n’ìtè | ‘there’s soup in the pot’ | |
| | Àhù dì ìn māmā | ‘I am well’ | |
| b. | Tá ă bú Éké bú áhíá | ‘today, which is eke, is a market day’ | } |
| | Low rising tones | | |
| | Gĩnĩ kà ógě kwùrù ùgbú à? | ‘what is the time now?’ | |

Igwe(1975) presents three facts about glide in Igbo:

- i. It occurs in the process of passing away from one syllable to another.
- ii. There must not be an intervening consonant between the vowels or syllabic nasals which occur in juxtaposition.
- iii. Two vowels or syllabic nasals must be contiguous.

In the opinion of Emenanjo (1987: 3), when two adjacent vowels are of the same pitch and the first is a close vowel, the two vowels are realized with one tone and the first vowel is realized as a semi-vowel. What happens when the two vowels are not of the same pitch? This question is what this paper shall provide the answer through the autosegmental phonology model. Eme (2008), in her discussion of parameters of intersegmental coordination in speech, identifies the presence of a high falling contour tone in her data and considers this occurrence in Igbo as an evidence of a lengthened vowel, or an evidence of two identical vowels with contrasting high and low pitches. She further points out that the fact of the two vowels adjacent explains the longer duration of the vowels when compared with a single vowel and considers the use of contour tone in such instances as a convenient way of representing the two identical vowels.

Mbah and Mbah (2010) distinguish between contour tone languages and register tone languages. They disclosed that contour tone languages make use of lots of glides overlaying words to derive different

meanings, while register tone languages are more discrete with tones falling on syllables. They point out that where register tone languages have a glide, it is an orthographic convention involving graphological elision.

It is evident from the foregoing that despite Igbo being a register tone language, tones sometimes glide. We agree with Igwe (1975) that this is phonetically motivated when two vowels appear contiguously either in the same word or in juxtaposed words with the second vowel, which constitutes a syllable, being either lower or higher than the one preceding it. It is this kind of behaviour that Eme (2008) describes as evidence of a lengthened vowel or two identical vowels with contrasting high and low pitches, and Mbah and Mbah (2010) describe as ‘graphological elision’. This paper uses the autosegmental phonology model to account for this kind of behaviour.

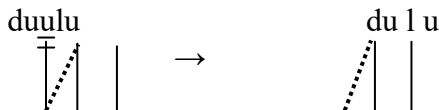
3.1 Autosegmental Analysis of Glide in Igbo

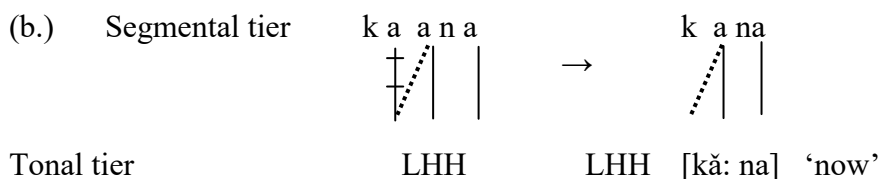
The autosegmental phonology model provides that tones are represented on a separate tier different from other tiers and as such may not necessarily be affected whenever a segment is affected. In Igbo, glide is a connected speech feature in which two identical adjacent vowels are realised at different pitches. In line with autosegmental phonology, one of the two identical adjacent vowels becomes deleted, while its tone moves to the next vowel, which is a tone-bearing unit. This kind of occurrence manifests in our Ụmụolum data in realisation of the following:

- | | | | |
|------|-----------|--------|---------|
| (16) | a. nọ̀nà | [nôṇa] | ‘now’ |
| | b. dùùlù | [dûlù] | ‘elder’ |
| | c. kàana | [kăna] | ‘here’ |

Expl.: In 16(a – c), the tones of the glided high vowels are not of the same pitch with the tones of the vowels following them.

Ụmụolum data have shown that in speech, two adjacent identical vowels can be realised as one sound, but in different pitches. The difference in pitch results into glide in tone; it is accounted for using the autosegmental phonology model.

- 17 (a.) Segmental tier duulu → du l u
- 
- Tonal tier H LL H LL [dû:lù] ‘elderly person’



4. Summary and Conclusion

This paper has been discussing tone gliding in Igbo. The discussion was based on the autosegmental phonology model of Goldsmith (1976). It sought to apply the autosegmental phonology model to explain glide in Igbo. It gave an overview of the model and its impact on glide formation and tone in Igbo and some other tone languages as presented by Goldsmith and other scholars. It also discussed some past studies on tone in Igbo.

Notwithstanding that Igbo is a register language, where tones are essentially level (Anagbogu, Mbah and Eme, 2001:97), when sounds appear in company in speech, tones glide in Umuolom dialect (falling tone [ˆ] and rising tone [˜]). This occurs as a result of the first of the two adjacent vowels with feature [+ high] turning into glide in speech or the realization of two adjacent identical v-elements as one sound, but different pitches. This agrees with the autosegmental phonology model which provides that features are represented on separate tiers and that every tier is independent of others as well as its provision for the association of floating tone to the nearest tone bearing unit. It is a consequence of two independent tones being mapped to a single syllable as noted by Katamba (1993:157), Clark and Yallop (1999:406) and Oostendorp, (2005:5-7).

In conclusion, the autosegmental phonology model has proved to be a good theory of phonology and has conveniently handled the issue of glide in Igbo tonology, in addition to the descriptive approach usually adopted in past literature in describing tone in Igbo. This paper is certainly an improvement on the past studies and a challenge to study other aspects of Igbo phonology using the autosegmental phonology model.

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