On the interaction of tone and intonation in Ika Igbo

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Abstract

This paper aims at showing how intonation and tone affect each other in Ika dialect. Ika, a dialect of Igbo, has some features of intonation which are absent in most other Igbo dialects, including the Standard Igbo. In addition, Ika has tonal features just like other dialects of Igbo. Experimental and perceptual methods were adopted to reveal how the two features – tone and intonation – interact. It was proved that in Ika, tone and intonation affect each other. This may be why Ika intonation patterns are not always realized on the same pitch level as those in intonation languages like English. It was also discovered that because of the effect of intonation, Ika tonal system differs slightly from that of standard Igbo. For instance, the terrace tone feature does not strictly exist in Ika. Rather more often, particularly in most interrogative utterances, there is an upstep at the final syllable. This, which is absent in standard Igbo, appears to be largely due to the effect of rising intonation.

1.0 Introduction

Ika intonation is different from that of most Igbo dialects. Whereas other Igbo dialects manifest only tone, Ika manifests intonation in addition to tone. It is only in a dialect like Abakaliki, as reported by Ikekeonwu (1986) that we have an upstep tone. That is, there is usually a slight rising intonation towards the end of utterances. This however, is not intonation as there is no attitudinal meaning attached to it. In Ika, intonation gives out attitudinal meaning hence this paper sets out to study how intonation and tone interact to achieve meaning in this dialect. Ika is a dialect of Igbo language which is of the (New) Benue - Congo sub-group of the Niger-Congo language family spoken in Nigeria. It is spoken mainly in the Ika North-East and Ika South Local Government Areas of Delta State and some parts of Edo State of Nigeria. It is classified under the Niger Igbo cluster of dialects spoken in areas around the west of the River Niger (Ikekeonwu, 1986).

Tone and intonation languages are distinguishable in the way they make use of pitch. While pitch is used for word meaning distinction in tone languages, it is used for distinguishing between sentence types in intonation languages, but predominantly it plays an important role in relaying the attitude of the speaker. Ika manifests both

tone and intonation and so pitch plays both tonal and intonation roles in this dialect. In other words, to reflect tone, pitch is used to distinguish between word meanings while Ika intonation distinguishes between types of utterances as well as their attitudinal meanings. Since both tone and intonation feature in Ika, the focus of this paper is on how intonation manifests in Ika as well as how the two affect or influence each other.

According to Cruttenden (1986) tone and intonation are mutually exclusive in languages. This is a generally - held view. Tone languages make use of intonation in the following ways, as specified by Cruttenden (1986: 11):

a. raising or lowering of the pitch level of the entire utterance;
b. downdrift in the absolute value of tones;
c. widening or narrowing of the range of pitch;
d. modification of the final tone of an utterance.

He cites Szechuanese as an example of a tone language that makes use of intonation. In this language, emphatic statements have high pitch raising, attitudes are expressed by a milder pitch range and questions involve final tone modification.

In the same vein, some intonation languages make limited use of tone. In other words, such languages have some words which are distinguished by tone. Swedish and Norwegian are examples of such languages. He reports that Swedish has about five hundred minimal pairs. Examples:

1. ˈburen - the cages
2. ˋburen - carried
3. ˈtanken - the tank
4. ˋtanken - the thought
5. ˈanden - the duck
6. ˋanden - the spirit

Another example is drawn from Panjabi, a North Indian language, where two major tones - high and low - exist irrespective of the fact that it is an intonation language. Cruttenden (1986) gives the example of a minimal triple in this language:

7. /ka˩a/ (low tone) - mess, fraud
8. /ka˥a/ (high tone) - impatient
9. /kaa/ (unmarked tone) - black
10. /paegyakaa/ - question intonation with unmarked tone - Has it turned black?
11. /paegyaka˩a/ - question intonation with low tone - has fraud taken place?
12. /paegyaka˥a/ - question intonation with high tone - has he become impatient?

Gussenhoven (2005) reports of Limburgian dialects some of which include Venlo, Roermond and Weert (spoken in Netherlands), Cologne (spoken in Germany) and, Tongeen, Hasselt and Borgloon (spoken in Belgium). In these dialects, a lexical tone opposition as well as a fairly extensive intonational system exists. The forms of the two tones vary with intonational context hence rather than only two patterns, there can be as many as twenty four patterns. Fournier, R.; Gussenhoven, C.; Peters, J. Swerts, M. and Verhoeven, J. (2009) show that these dialects, which are mutually intelligible, have two tones – stoottoon (push tone) and sleeptoon (dragging tone). The pronunciation of the two tones depends on the place the accented syllable occurs in the sentence and also, on the intonation contour used. They cite the example of Cologne where the sleeptoon is realized with a high level tone in non-final positions but with a high level pitch plus a fall on sentence-final syllables.

Yanhong, Z., Shawn, L.N., and Alexander, L.F., (2008) conducted a study involving the comparison of the use of English lexical stress contrasts by ten Mandarin and ten English native speakers. Results showed that Mandarin speakers produced stressed syllables with higher fundamental frequencies than English speakers. They conclude that the existence of lexical tone in Mandarin language was one of the reasons for this difference. Here, we see stress, a major correlate of intonation, being affected by tone.

Could the dialect under study, be comfortably classified as an intonation one making use of tone or rather as a tonal dialect making use of intonation? To help us answer this question, we consider another class of language, pitch accent. Cruttenden (1986) distinguishes between pitch accent and stress accent languages. For him, the former refers to languages which use pitch primarily for intonation purposes. Katamba (1989: 210) explains the features of pitch accent languages in a distinctly

clear way. He reports that in pitch accent languages, there can be at most one peak of prominence in a word. This means that there is only one main stress. In this way, such languages share some characteristics with intonation languages like English, French, German and so on. In addition, pitch accent languages use pitch contrasts phonemically just as is seen in tone languages. Thus we have minimal pairs distinguished by pitch differences alone. Pitch accent languages, therefore, share features with stress accent (intonation) languages as well as with tone languages. Examples of pitch accent languages include Japanese and Serbo-Croatian. Swedish and Panjabi are sometimes classified as pitch accent.

Cruttenden (1986:14) would rather classify Swedish as an intonation language that make limited use of tone because it has the possibility of having tonal contrasts on one syllable unlike Japanese. He however explains that if the notion of mora is to be used, then the difference between Japanese and Swedish is reduced since a high pitch will apply to a mora thus one high pitch on each accented word. Therefore, he concludes that any taxonomy of the use of pitch patterns in language cannot involve absolutely discrete and clear-cut categories.

2.0 Ika intonation system

According to Barnheit (1995) tone in Linguistics, among other things, refers to "any one of the tonal levels distinctive in a language". He also specifies that in phonetics, it is seen as the sound produced by the vibration of the vocal cords as well as the stress or emphasis placed on a syllable. On the other hand, intonation has to do with the rise and fall in the pitch of the voice as one speaks. Ika is a dialect of Igbo. Ika has as many tonal combinatory possibilities as exist in Standard Igbo. However, Williamson (1968) reports that Keir indicates that Ika, along with Ukwuani, are separate from other Igbo dialects on 'purely linguistic grounds'. In her work on Ika, Williamson (1968) reports that Ika has three tones – high, low and mid. Probably, the mid could be the downstep. In Ika, tone and intonation feature. It is worthwhile therefore to see how they both influence each other.

Ika has many varieties but most of them have similar intonation system and are mutually intelligible. This work is centred on the Umunede variety. Ika intonation system is such that both tone and intonation feature side by side in utterances. While it may not be referred to as an intonation language, it makes extensive use of intonation such that leaving out the effect of intonation in the description of Ika tone system may be grossly inadequate. In addition to the tones existing in other Igbo dialects, Ika has the following tune patterns:

HF (ˋ): high fall tune pattern

LF (ˎ): low fall tune pattern

HR (ˊ): high rise tune pattern

LR (ˏ): low rise tune pattern

FR (v): fall rise tune pattern

RF (∧): rise fall tune pattern

Also, we have an intonation pattern that could be referred to as rise-fall-rise, following Cruttenden's classification. However, since this does not bring about any major meaning difference, it is not seen as a tune of its own but as a type of Fall Rise. From henceforth, these tunes may be identified with their short forms – LF, HF etc.

The 'Rise Fall' in Ika is not necessarily the type we have in English. The HR in Ika often sounds a little lower than that of English when it occurs with a low tone. This can be seen in the Ika word, aba (father). In this one – word utterance, 'a^ba' and the English utterance, 'yes' produced by two female speakers, we have the following pitch levels as shown in the table below:

Table 1: Pitch levels for Ika and English Rise Fall intonation pattern

Utterances		Aba (father?)	Yes
First speaker	Highest point	292Hz	286Hz
	Lowest point	185Hz	244Hz
Second speaker	Highest point	284Hz	238Hz
	Lowest point	147Hz	164Hz

2.1 Functions of tone in Ika

In Ika, tone performs the following grammatical functions:

A. It distinguishes between negative and affirmative sentences. Example:

13. Ò nwé. - He/she has.
14. Ó !nwé - He/she does not have.

In sentence 1, the affirmative sentence has low and high tones while the negative has high and downstep tones.

B. It distinguishes between tenses. We have already seen this above. Example:

15. Ọ̀ bịà - He came. (simple past)
16. Ọ́ bịá - He comes. (habitual)
17. Ọ̀ bịá - He came. (and probably has gone)

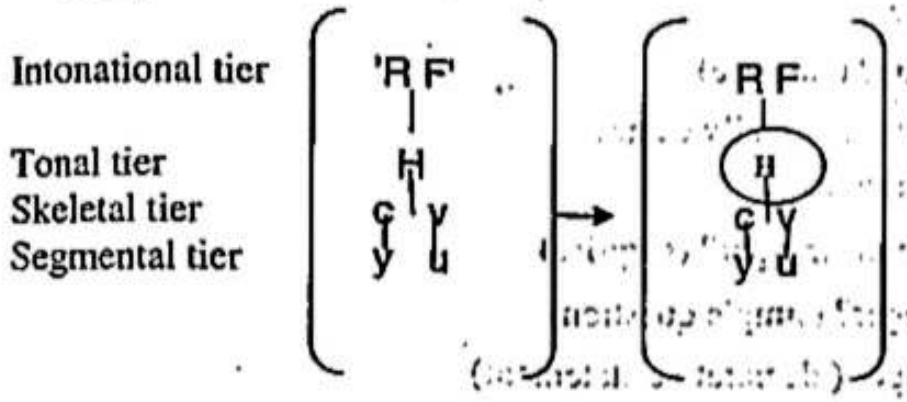
In Ika, tone does not distinguish between interrogatives and declaratives as it does in Standard and most Igbo dialects. Contrarily, in Ika, this function belongs to intonation as it obtains in English and other intonation languages.

3.0 Interaction between tone and intonation in Ika

Chomsky's basic insight for phonology as pointed out by Wells (1991) is that we need to draw a sharp distinction between the surface representation of an utterance (sounds actually uttered) and the underlying representation of elements constituting a sentence (forms in the mind). The former is a reflection of performance, the latter, of competence. A chain of rules link the two levels of representation - Wells (1991: 101). Example:

Underlying Representation Surface representation

18. yú? (where are you?)
/^ju//



Here, we can formulate a rule that, when a high-toned syllable bears the 'RF' tune pattern, the high tone is lost, such that only the 'RF' is perceived. We need this kind of phonological analysis to explain the kind of interaction that takes place between tone and intonation in Ika. The interaction between tone and intonation in Ika may result in the following:

(i) delayed release of one or both of them – the shifting of one to another position.
(ii) interruption, compression or shortening of one or both.
(iii) omission or elimination of one.
(iv) overlapping or merging of both – when both tone and intonation occur on one syllable, there may be an overlap and each is adjusted to enable the other be pronounced.
(v) superimposition of intonation over tone.
(vi) overshooting of one or both.

Generally, intonation has a greater influence over tone in Ika. However, Uguru (2007) clearly shows that tone affects the harmonicity of intonation patterns in Ika, making them to sound lower than they should except in cases where nasals are included in the nucleus.

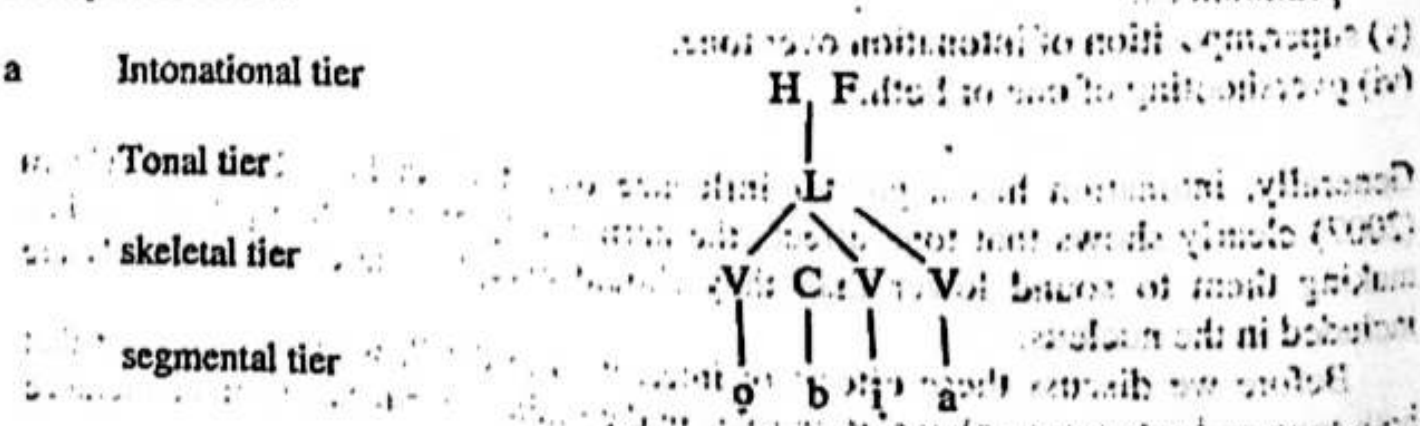
Before we discuss these effects of interaction in detail, we must point out that both tone and intonation play certain roles in determining the meaning of an utterance in Ika. This can be observed from the utterances below:

19a. Ọ̀ bị̀à. - He came.
/ɔ̌bɪa//- Did he come?
/ɔ̀bɪa//- He came.
/ɔ́bɪa// - He came? (surprise)
/ɔ̧bɪa//- He did come. (really came)

19b. Ọ̀ bị̀a - visitor/stranger.
/ɔ́ bɪa// - you mean stranger? (surprise)
/ɔ̌bɪa// - a stranger? (simple question)
/ɔbɪa// - a stranger (declarative statement)

Above, we observe that the various syllables of the utterances all have their distinct pitches but the tune pattern borne by the nucleus, 'bịa', determines the general pitch of the utterance. Thus the tonal patterns distinguish the sentence, 'Ọ bịa.' (He came) in (19a) from the word, 'ọbịa' (visitor/stranger) in (19b). The tune patterns show the various attitudes and the grammatical structures of both the word and the sentence. This is where the two - tone and intonation - intercept in Ika phonology. However, representing both of them (with diacritics) may be confusing. We therefore suggest that the best way to represent the interaction or manifestation of tone and intonation as we have in Ika may be to use the autosegmentalframework, where the tonal tier and what could be referred to as the intonational tier, can be distinctly shown. This is exemplified below:

a



(stranger/visitor) and (He came)

The chart above clearly shows us the intonation and tone of the word/sentence 'obja' (stranger/visitor) or 'o bja' (he came).

The metrical grid (metrical phonology) could also be used to determine which of the utterances is the word and the sentence. This is because it can show which syllable is the nucleus. The illustration below explains this.

a. * end rule
* * word level
* * foot level
* * * syllable level
o b j a
(visitor/stranger)

b * end rule
* * word level
* * foot level
* * * syllable level
o b j a
(He/she came)

The grids above show that (a) is one word as we can see from the word level while (b) is a sentence made up of two words. The grid also shows that the syllable, 'bia' is the nucleus in both utterances. Once the nucleus is determined, it is automatically assumed that the said syllable bears intonation pattern and the rest of other syllables bear tonal patterns. Considering the fact that stress features in intonation languages, it can be observed that stress occurrence in Ika is somewhat different from that of intonation languages like English. In Ika utterances, most of the syllables are pronounced with equal force with the nucleus bearing a greater force. Thus in our analysis (metrical grid), we would want to regard these tonal patterns as secondary stress while the nucleus is seen as the one bearing the primary stress. However, it appears that the autosegmental phonology can account for this phenomenon better. Metrical phonology is not able to account for both tonal and intonational manifestations. This can be done by autosegmental phonology. Metrical phonology could, however, be employed since generally in Ika, intonation has a greater influence over tone.

On the effects of the interaction between tone and intonation, it has earlier been pointed out that one or both of them could be shortened; example:

20. Ó mézí yú? - (what if you were the one?)
/o mezi ju//

Here, both the FR and the high tone on 'yú' are shortened. This may be to accommodate each other and possibly ensure that the syllable is pronounced within the specified time.

There could also be a delayed pronunciation of one or both of them, causing one, usually intonation, to move to another position. This is evidenced in an utterance with a split or divided FR as seen in Cruttenden (1986: 108). Example in Ika:

21. Mmé kà í àgwá?
/m mɛ ka ɪ a gwa//
I am the one you are telling?

Above, the FR that should be on the syllable, 'gwa' is split - the fall goes to 'mẹ' while the rise remains on 'gwa'. According to Cruttenden, in this case, the rise is "downgraded". Besides, there could be an 'overshooting' of an intonation pattern as seen below:

22. Mí ịjí ná-érú...
/mʤi ne ɹu//
Before I got /reached ...

Here, the normal tune should be FR and the syllable, 'ru', should bear downstep tone but there is an 'overshooting' of pitch here to show surprise thus the FR is overshot to HR. Also, the downstep tone of 'ru' is merged into the HR and gets a high tone. The resultant intonation pattern, HR, overshadows the tone pattern. Furthermore, there could be elimination of one of them. Elimination of tone, for instance, usually occurs in one-word sentences. This is seen below:

23. yụ́?

/ ˆjʊ//

Where are you/what of you?

In the utterance above, the high tone on 'yụ' is totally eliminated and only the 'RF' intonation pattern is pronounced.

There could be an overlap (merging) of tone and intonation as seen below:

24. Ó mézí yụ́?

/o mezi ˈjʊ//

What if it was you? (surprise)

Here, one can hardly separate the high tone on 'yụ' from the HR on the same syllable.

LR is used for itemization and in doing this, there appears to be a merging of the intonation pattern, LR, and the tone of the last syllable. This could mislead one into mistaking the LR for elongation of the last syllable of the word. It could also be mistaken for an 'overshooting' of the tone. Example:

25. Ụ́mụ̀ódè, Òtòlòkpò, Ékwùọ́má...

/ʊmʊo˛de/ otolo˛kpo/ ekwuɔ˛ma//

A fall rise usually overshadows tones such that there may be no point indicating the tone pattern (its diacritic mark). Examples:

26. ụ́kà?
/ʊˇka//
church?
27. Éghó?
/eˇɣo//
money?

We observe that most of the processes involved in the interaction between tone and intonation in Ika go on concurrently. However, tone and intonation support each other to effect meaningful communication in Ika. Tone determines the level of pitch from where the intonation pattern takes off thus the speaker adjusts his/her vocal cords in readiness to produce the intonation. Ika intonation patterns take higher or lower pitches depending on the tones of the syllables. We observe that HR in a high-toned syllable is usually higher than the one in a low-toned syllable.

Similarly, intonation pattern determines the height of pitch for the production of a tone pattern. Thus high tone in an utterance bearing LR, for instance, is relatively lower than the one in an utterance bearing HR. Some acoustic analyses carried out to authenticate this are shown below.

Low rise intonation (casual question)
28. ˏWe – *they* (emphasis) (214 Hz)
H

High rise intonation
29. ˊWe? – *they?* (276 Hz)
H

Fall rise intonation
30. ᵛWe ? – *You mean them?* (260 Hz)
H

High rise intonation
31. I̤ ˊsi̤? – *pardon? /come again.* (300 Hz)
L L

32. Kə wụ ˈtaanị? – *(did you say) what day is* (202.5 Hz)'
H L HL L *is today?*

Rise fall intonation

33. O bu ǫ^nyị? –*Does it cause dysentery?* (259.5 Hz)'
L HL L (disbelief)

The tones of the syllables in the examples are indicated with capital letters below the syllables. It can be observed that the pitches of the utterances are determined by both the tones and the intonation patterns. While the tones determine the height of the pitch of the intonation patterns, intonation also affects the realisation of the tones. This is what shortening and overshooting of one or both is all about.

This process of one trying to accommodate the other triggers off the effects we have already discussed. This also could be the major reason why Ika tunes are realized on pitches different from those of English. The effect of the interaction on tone can be seen from the examples below:

34. ẹ́kwà - cloth
/ɛ́ kwa// - (cloth) lower high tone, lower low tone because of HF
/ɛ́ kwa// -(cloth?) higher high tone, higher low tone because of HR

We therefore infer that there is some degree of interaction between tone and intonation in Ika.

3.0 Summary and conclusion

In this paper, it has been established that tone and intonation affect each other in Ika. While tone determines the pitch level at which the intonation patterns are produced, intonation has an overshadowing effect on tone. These effects make Ika tune patterns, which otherwise are similar to those of English, to sound slightly different from those of English. Also, the effects result in the lexical tones being obliterated in speech most of the time. From the foregoing therefore, Ika appears to fall into a group of languages we would term 'accent' languages. These are languages that make fairly extensive use of both tone and intonation.

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