

LOW RISE AND HIGH RISE INTONATION IN ENGLISH AND IKA IGBO: AN ACOUSTIC ANALYSIS

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Monosyllabic, disyllabic and short utterances made in two rising intonation patterns in English and Ika – Low Rise and High Rise - were recorded from two male native speakers of Ika and one native speaker of English. These were analysed using the praat system. The analysis is two – fold. Firstly, there is the comparison of the curves of Ika utterances made in either of the rising tunes with those made in similar tunes in English. In addition, there is also the comparison of the curves of the individual intonation patterns within the same language. In other words, there is comparison between the Ika Low Rise and Ika High Rise on one hand, and the English Low Rise and English High Rise on the other. Findings from the study show that the curves of the two tunes in Ika, a predominantly tone language, and English an intonation language, are generally similar. This confirms that Ika manifests intonation thus revealing that a tone language can, to a large degree, manifest features typically associated with intonation languages. However, the intra – language comparison reveals gross dissimilarities between the High Rise and the Low Rise patterns within the two languages. These dissimilarities are attributable to a significant difference in the manner of production of Low Rise and High Rise tunes.

Dans cette étude, nous avons appliqué la méthode *praat* à une analyse comparative de courtes expressions monosyllabes et dissyllabes enregistrées en ika, chez deux locuteurs autochtones, et en anglais chez un locuteur anglais. Les enregistrements sonores analysés se situent aux deux niveaux intonatifs montants qui suivent : le bas ton élevé et le haut ton élevé. L'étude comporte deux parties. La première partie porte sur une analyse comparative des courbes de niveaux d'intonation en ika et en anglais. Dans la deuxième partie, nous avons fait une comparaison des courbes de niveaux intonatifs dans chacune des deux langues. Autrement dit, nous avons comparé d'une part, le bas ton élevé et le haut ton élevé en ika, d'autre part, le bas ton élevé et le haut ton élevé en anglais. Les résultats obtenus dans cette étude révèlent qu'il existe des affinités intonatives entre l'ika, qui est essentiellement une langue de timbre masculin, et l'anglais, une langue d'intonation. Donc, la manifestation de l'intonation en ika confirme que, d'une manière générale, une langue de timbre masculin peut renfermer des traits caractéristiques d'une langue d'intonation. Cependant, la comparaison intralingue signale des divergences fondamentales entre le bas ton élevé et le haut ton élevé dans les deux langues. Ces divergences sont provoquées par les différentes méthodes de production des deux niveaux intonatifs étudiés.

0. INTRODUCTION

Ika has similar intonation patterns with English and it is hoped that comparing the acoustic characteristics of both languages will authenticate the existence of intonation in a tone language, Ika Igbo. 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. Speakers of Ika live 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 of the Niger Igbo cluster of dialects spoken in areas around the west of the River Niger (Ikekeonwu, 1986). Also, Nwaozuzu (2008) has classified it as belonging to the West Niger Group of Dialects. Williamson (1968), who wrote a comparative word list on Ika and Ukwuani, points out that both dialects, though regarded as dialects of Igbo, are separate from other Igbo dialects on 'purely linguistic grounds'. She reports that Ika has three tones – high, low, and mid. The one classified as mid is the downstep. One can infer this from the tone classes she outlines since she does not include the mid but rather has the step. She identifies four tone classes: -

Tone I	high - high high - step
Tone II	low - high
Tone III	high - low
Tone IV	low – low

These tone classes have been modified because Igbo studies have progressed tremendously since Williamson's publication. Williamson (1968) fails to point out the intonation features existent in Ika. The difference in the Ika sound system, relative to other Igbo dialects, which she points out, may be because of these intonation features. This omission creates a lapse in the study of Ika which, to a certain extent, fails to fit into most tonal classifications in Igbo. This study therefore aims at removing that lapse and comparing Ika with a language that has a similar intonation system – English – to make for a clearer understanding of its intonation system.

1. LOCATION OF IKA SPEAKING TOWNS

The geographical locations where Ika speakers live include such towns as Agbor, Umunede, Abavo, Igbanke (in Edo State), Otolokpo, Owere-Olubo, and so on (Long.6°00 N – Lat. 6°25 N and 6°05 E – 6°25 E). A look at the map on the next page (Figure 1) shows more of these towns:

2. IKA INTONATION SYSTEM

Ika has many varieties but most of them have similar intonation systems and are mutually intelligible. The intonation system of Ika is very much different from those of other dialects of Igbo. Though it is mainly a tone language, there is ample evidence that Ika has intonation features (Uguru, 2000 and Uguru, 2004). It manifests six basic intonation patterns which also exist in English. These are:

High Fall	(HF) -	(\)
Low Fall	(LF) -	(/)
High Rise	(HR) -	(/)
Low Rise	(LR) -	(\)
Fall Rise	(FR) -	(v)
Rise Fall	(RF) -	(^)

Intonation, in this dialect, is used to effect various meanings - attitudinal, syntactic, emotional and so on (Uguru, 2004). Of major importance is that intonation distinguishes between declaratives and interrogatives except in 'wh' questions. The example below shows this.

- (1) **Onye** ^h**bia**? - Who came?
- (2) **Yu** ^h**je** ^h**a** ^h**fia**. - You were the one who went to the market.
- (3) **Yu** ^h**je** ^h**a** ^h**fia** ? - Were you the one who went to the market?

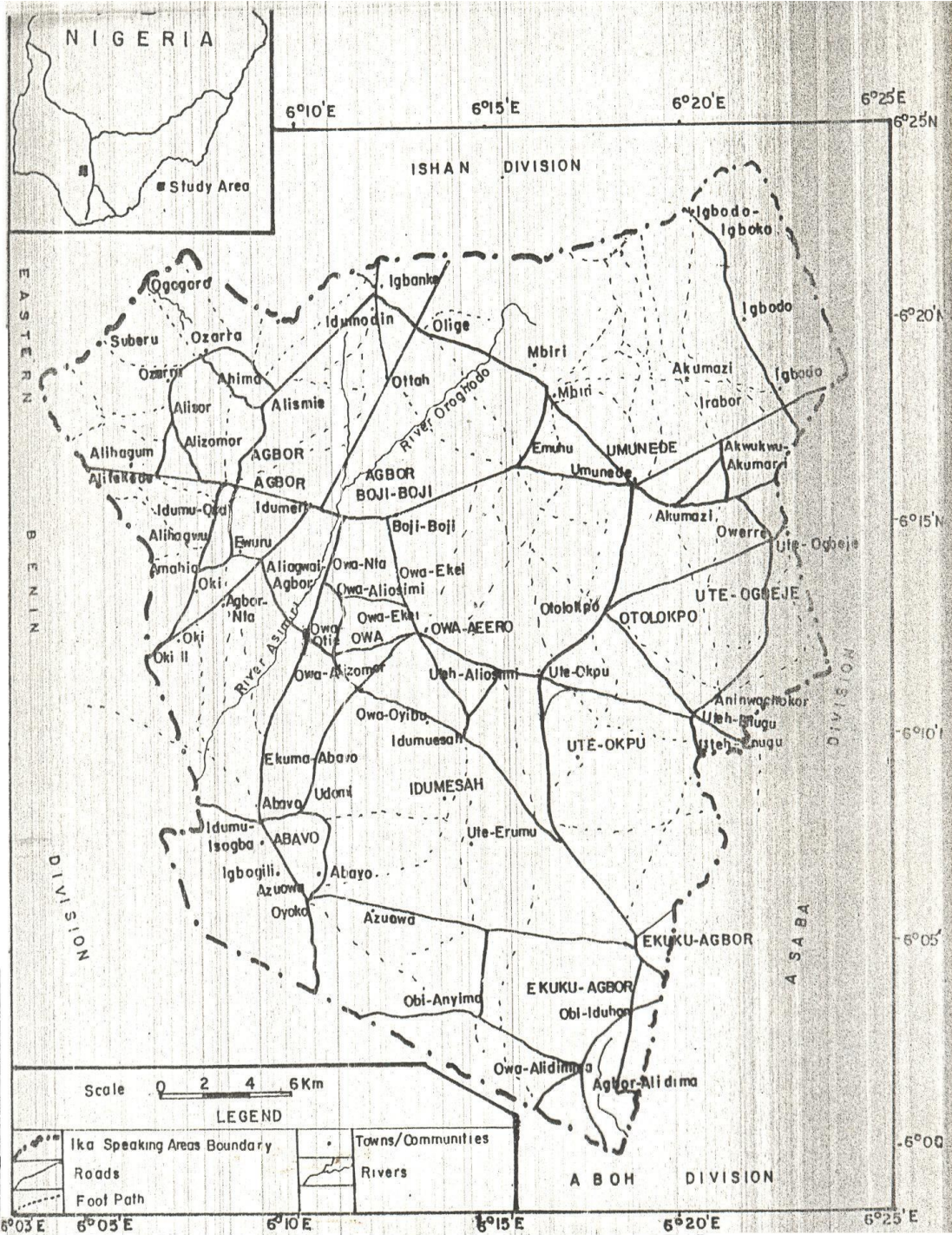


Figure.1: Map of Ika speaking areas

The variety of Ika studied in this study is that of Umunede. The basis for this choice is that it is one of the varieties with diverse intonation patterns.

In the examples above, intonation distinguishes between a statement and a question. This is unlike what obtains in most Igbo dialects where morpho-syntactic devices are applied in changing a statement to a question. In those dialects, no change in intonation occurs. This is seen in the Standard Igbo examples below.

(4) **I gara / jere a^hhia** – you went to the market.

(5) **Q bu gi gara/jere a^hhia?** – Were you the one who went to the market?

Above, the structure - **Q bu** ... is an obligatory element used for converting the statement to a question.

High fall and Low fall intonation patterns are used normally for declaratives. This can be seen below.

(6) **Nwa i^h ro.** – It is your child

High Rise tune pattern is used for yes /no questions and expressing surprise.

(7) **'Me'?** – me ? (with surprise)

Low Rise is used for linking intonation groups or sentences. It shows non-finality, reservation or reassurance, e.g.

(8) **M ji na e/ru / o^h bjale.** – Before I reached, she had come.

Fall Rise is used for showing non-finality, asking questions –particularly echo and tag questions, making requests and expressing reservation. In carrying out discursal function, intonation shows the general information about the structure of an utterance. It shows much about the focussed word in a tonal intonation group.

In addition to intonation, Ika has lexical tone – high (/), low (\) and step (!). thus having a combination of both tone and intonation. Pitch does not effect lexical differences in non-tone (intonation) languages as it does in tone languages (Dooren and Eynde 1982). Whereas in tone languages, every syllable of an utterance has its tone, in intonation languages only one syllable in an intonation group bears the intonation and this primarily expresses attitude. Occasionally, tone languages may manifest characteristics that are purely for intonation languages; for instance the use of tone for syntactic connection. This is evident in the use of the Low Rise intonation in itemization – a device which links words and phrases. Also downdrift, a feature of declination, which is an intonational phenomenon, features in tone languages like Igbo (Hulst and Smith, 1982; Ikekeonwu, 1993; Obianika, 1999; etcetera) and Urhobo (Aziza, 1998). In addition to attitudinal meanings, Ika intonation patterns also denote attitudinal as well as discursal meanings. In most other Igbo dialects, the use of intonation is mostly in the following ways as obtains in all tone languages (Cruttenden, 1986):

- i. Raising or lowering of the pitch level of the entire utterance;
- ii. Downdrift in the absolute values of tones;
- iii. Widening or narrowing of the range of pitch;
- iv. Modification of the final tone of an utterance.

Thus, going by Cruttenden's categorization, while intonation performs a wide range of functions in Ika, its function in many Igbo dialects is restricted to the four major ways of manifestations outlined above. Hence in tone languages, intonation modifies but does not obliterate the underlying patterns of tonal contrast (Gregerson, 1977). The intonational phenomena that feature in tone languages like Igbo are the downstep and the downdrift (Ikekeonwu, 1993). Downdrift refers to the lowering of successive high tones because of intervening low ones (Ikekeonwu, 1993). Tone and intonation interact with each other in Ika. Due to this effect on each other, tune patterns, which are perceptually, basically similar to those of English, are not realised on the same pitch level as those of their English counterparts.

Two intonation patterns, Low Rise and High Rise (hereafter referred to as LR and HR) which are both existent in English and Ika, form the major focus of this study. Though both are rising tunes, there are certain features (as is pointed out in this paper) which distinguish them. Nomenclature can sufficiently establish some differences between these two intonation patterns. In this study, the pitch curves of utterances made in these tunes clearly show the differences. Furthermore, the pitch curves display the similarities between the English LR and HR and their Ika counterparts. The attitudinal meanings of both tunes in the two languages are not strictly the same. In English, the LR has a number of uses: encouragement, asking casual questions, linking clauses and itemization (Christophersen, 1956 and Cruttenden, 1986). In Ika, the LR signifies reassurance. In addition, Ika LR is useful for itemization and showing emphasis as well as asking questions (Uguru, 2000 and Uguru, 2004). The use of HR indicates surprise as well as interrogation in both languages. The slight meaning differences as well as the faint pitch differences perceivable between the English LR and HR and their Ika counterparts necessitates this work which targets at revealing and comparing the pitch values and curves of both tunes in the two languages so as to determine their similarities and differences.

3. ENGLISH INTONATION SYSTEM

English, an intonation language, has six basic intonation patterns which appear below (Gimson, 1975; Cruttenden, 1986).

High Fall	(HF) -	(\)
Low Fall	(LF) -	(\)
High Rise	(HR) -	(/)
Low Rise	(LR) -	(/)
Fall Rise	(FR) -	(v)
Rise Fall	(RF) -	(^)

Although virtually all sentence types can go with any of the tune patterns, depending on the context, traditionally there are favourite tunes for certain types of sentences. HF would usually go with declaratives and 'wh' questions.

(9) **She is \ here.**

(10). **Who is \ here?**

LF is used to show disenchantment in declaratives.

(11) **She is / here.**

HR is used for yes/no questions and expressing surprise.

- (12) **She is** /here?
 (13) **You mean** /it?
 (14) /**Really**?

LR is used for asking casual questions, linking clauses and itemization.

- (15) /**Going out, she** \saw a friend.
 (16) **You are** /going?
 (17) **I bought** /bananas /oranges /groundnuts and a bottle of \wine.

FR is used to show reservation and indifference.

- (18) Ade: **truant in the class**?
 Obi: **I don't** v know.

RF is used to express surprise and shocked surprise.

- (19) Joan: **I gave out my best** \dress last week.
 Ada: **You** ^did?
 Ngozi: ^**Great**.

In the above dialogue, Ada uses the RF to express surprise and disbelief and also ask a question. Ngozi uses it to show surprise with encouragement.

4. METHODS

4.1 SAMPLING TECHNIQUE AND SUBJECTS

The study centres on LR and HR tunes. These are not universal tunes and are not existent in any other Igbo dialects (Uguru, 2000; Ikekeonwu, 1986). Contrarily, High Fall and Low Fall are universal tunes, existing in both tone and intonation languages. It is therefore essential to use tunes which exist only in intonation languages to make for objectivity in the findings.

The sampling technique in this study is that of *Judgment sampling*. This technique enables one to identify and select only the samples that fit the categories necessary for a study (Milroy, 1987:26). Thus in this research, the two Ika informants as well as the English informant used are those that can effectively supply information for the study. Milroy shows that very consistent patterns emerge even with a very small sample, provided the selection of the sample is systematic. Thus pronunciation of the informants, who are native speakers of the two languages, form the data in this comparative study. These informants are two adult male native speakers of Ika and one adult male native speaker of English. The Ika informants are well versed in the use of Ika intonation being conversant with Umunede speech patterns. Their pronunciations were tape – recorded and fed into the computer for analysis. The recording of Gimson (1975) which has an accurate use of English intonation (Gimson's pronunciation) contained in the tape to his book, *A Practical Course of English Pronunciation*, serves as the English data for this work. This serves as the native English speaker since it is not easy to get a native English speaker in our immediate environment. His utterances form a base for selecting Ika utterances. Thus, as much as possible, we have a selection of Ika utterances which have phonemes similar to those in Gimson's. This measure ensures balanced analysis since the phonemes used for both languages have similar manner and place of articulation.

4.2 STIMULI

Gimson’s pronunciation of English utterances – **no, yes** and **when did you come** serve as control for the study. The two Ika male native speakers are instructed to produce the Ika utterances –**nu, ya** and **we edikñ**. No reflect certain meanings. Their use of the LR and HR intonation patterns brought variations in the attitudinal meanings of the utterances. Below, are the two sets of utterances (the English ones by Gimson and those of Ika by our two informants) with the lexical tones of the Ika utterances indicated beneath the respective syllables.

<i>Ika</i> Word	Intonation Pattern	Attitudinal Meaning/Translation
Nu H /nu/	LR	Emphasis (Hear)
Nu H /nu/	HR	Surprise (hear)
Ya H /ja/	LR	Emphasis (he/she/it)
Ya H /ja/	HR	Surprise (he/she/it)
We edikñ HH L L /we edikɔ/	LR	Casual question or emphasis (Won’t they endure?)
We edikñ HH L L /we edikɔ/	HR	Surprise (Won’t they endure?)
<i>English</i> Word	Intonation Pattern	Attitudinal Meaning
No /neʊ/	LR	Encouraging
No /neʊ/	HR	Surprise
Yes /jes/	LR	Encouraging

Yes	HR	Surprise
/jes/		
When did you, come?	LR	Encouragement, wondering
/wen dɪd ju kɔm/		
When did you, come?	HR	Surprise
/wen dɪd ju kɔm/		

To reveal the effect a low tone would have on the intonation types, the following Ika low-toned intonation bearing syllables were also analysed instrumentally. They have no English counterparts but are solely used to see if the inherent low tone of the syllables would result in lowered pitch of the intonation types. They are:

ǎa LR	Casual question or emphasis (maize?)
H L	
/ɔka/	
ǎa HR	Surprise (you mean maize?)
H L	
/ɔka/	
ǎô LR	Casual question or emphasis
L L	(has it (water) warmed?)
/ɔ nu/	
ǎô HR	Surprise (has it warmed?)
L L	

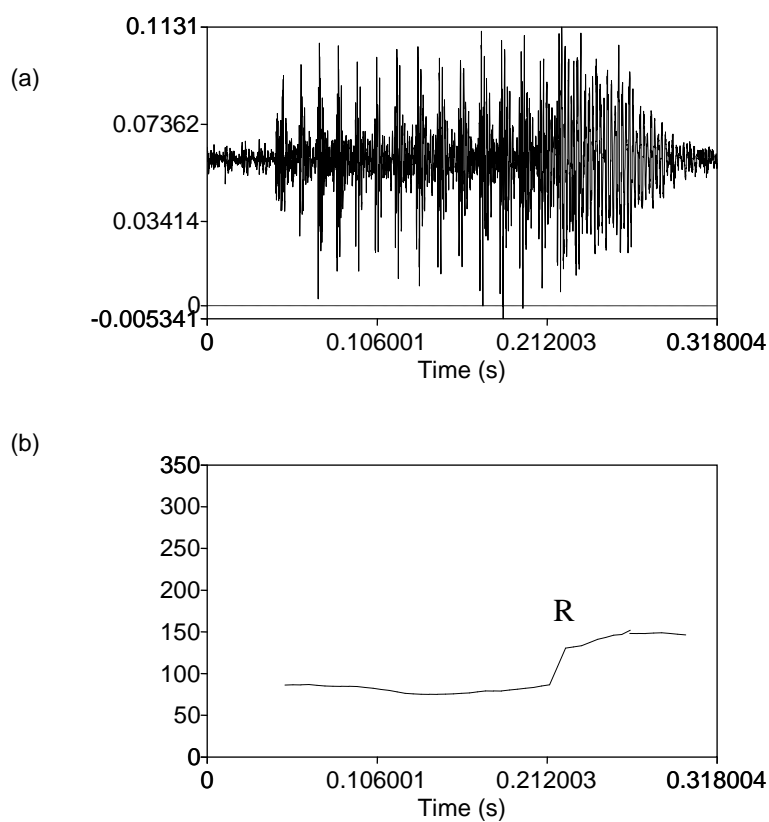
4.3 PROCEDURE

These pronunciations were tape – recorded and fed into a Windows XP computer. They were digitized at 8000 KHz and analyzed using the *praat* package.

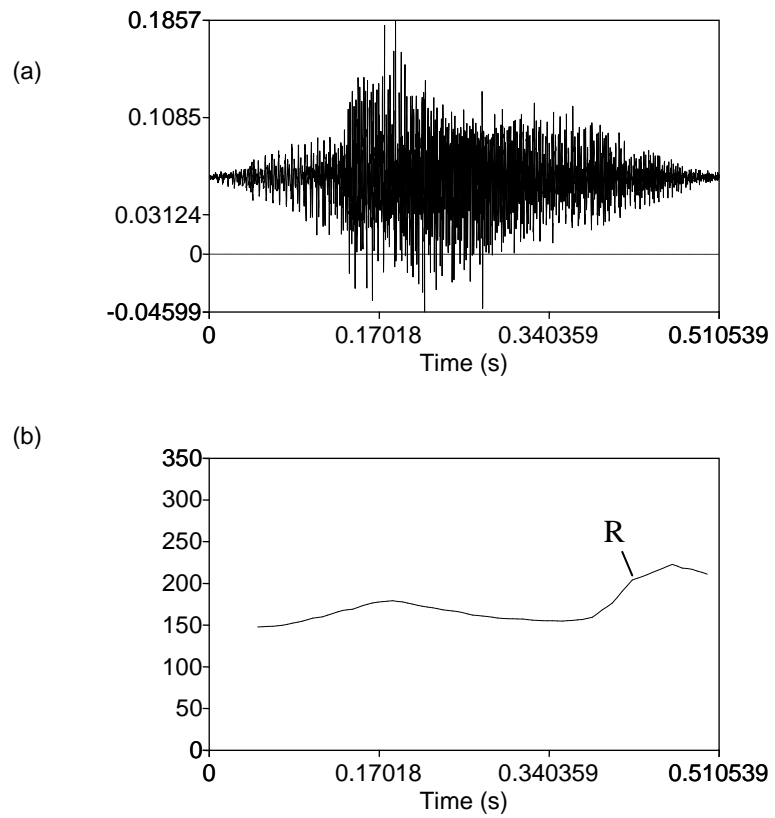
5. RESULTS

5.1. ACOUSTIC DATA AND ANALYSES

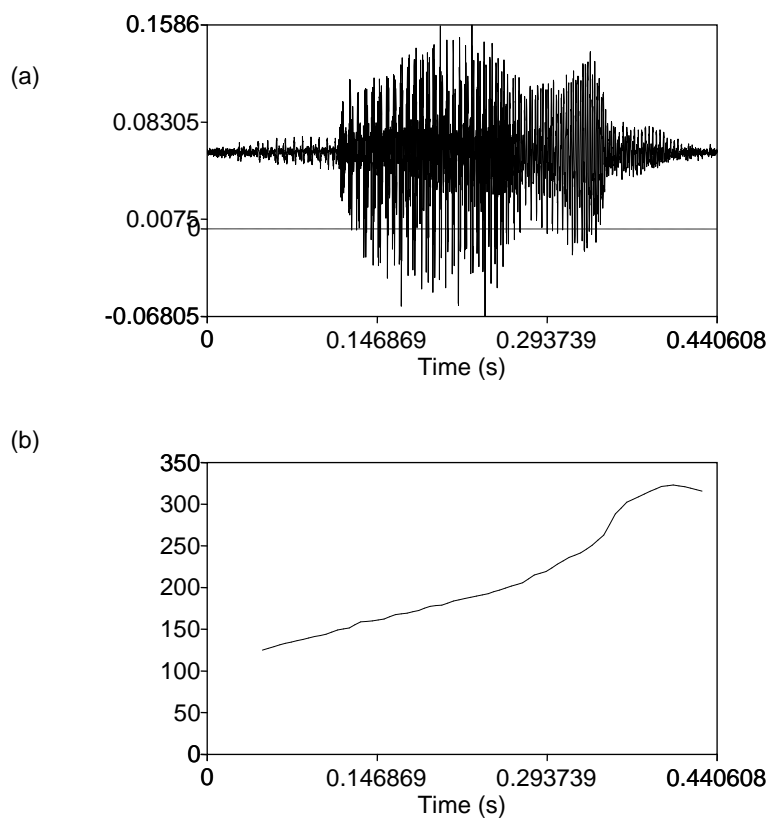
To facilitate the analysis of the acoustic properties of the subjects' productions, some of the curves are displayed below. However the productions of the second Ika speaker were not displayed. This was to avoid having too many figures. A table containing the pitch values of utterances produced by all the three informants together with appropriate charts show the details of the results.



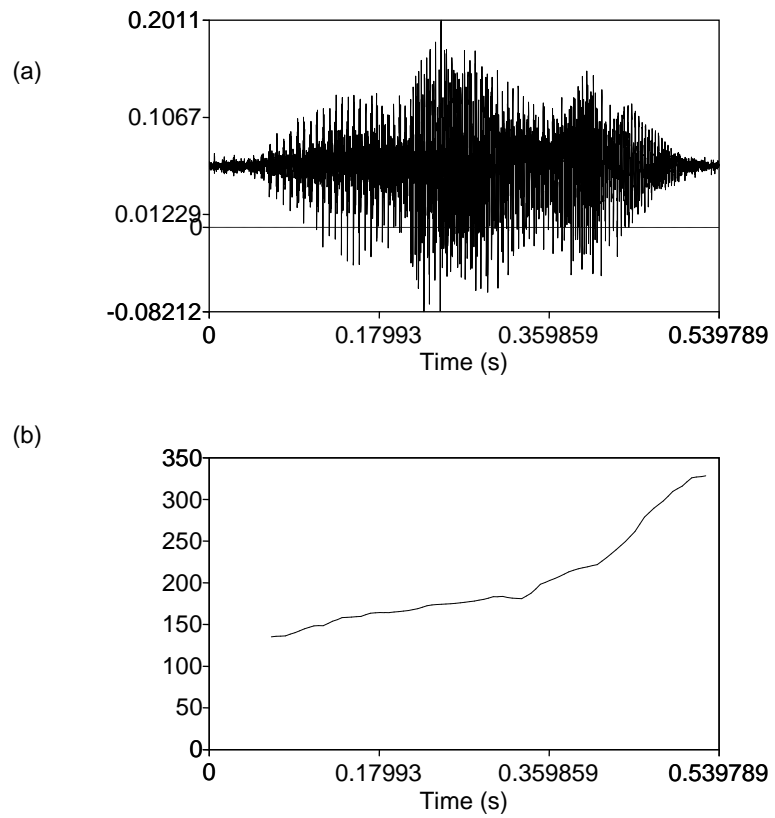
Figs. 2a & b: Low Rise intonation pattern for the English utterance **no**.



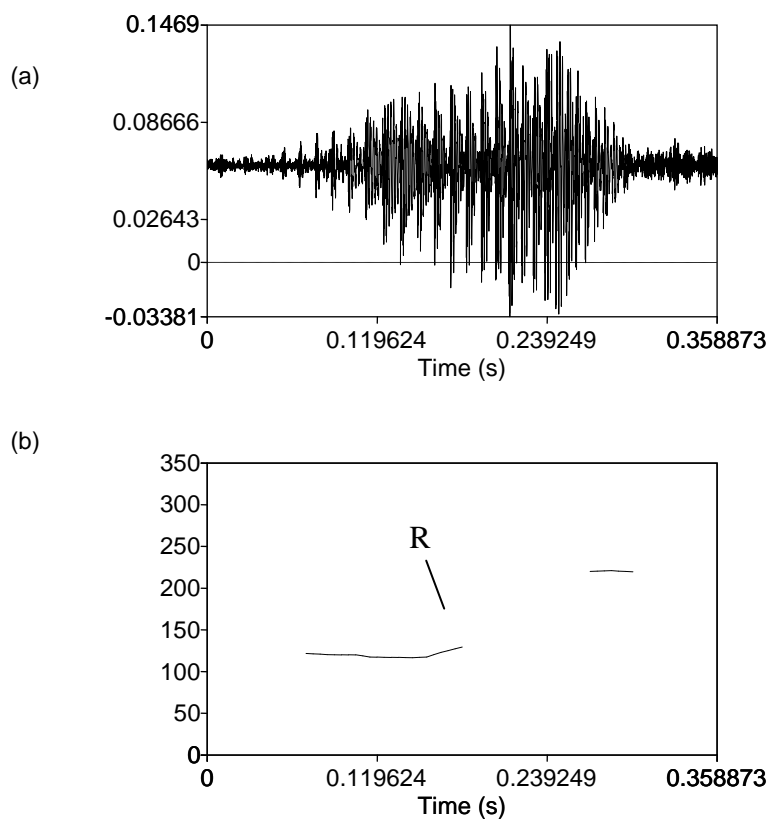
Figs. 3a & b: Low Rise intonation pattern for the Ika utterance **nu**



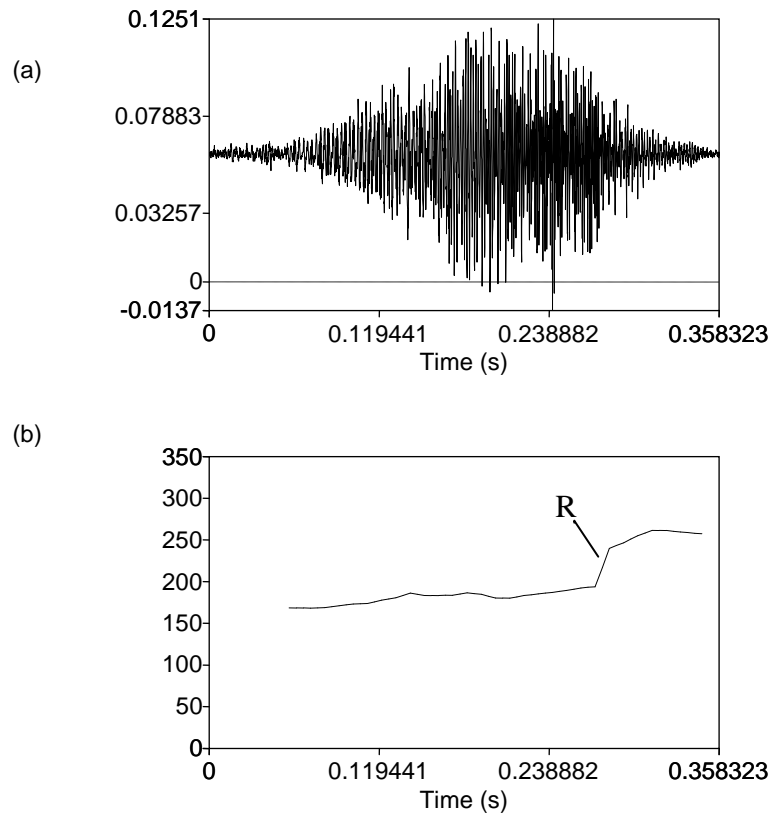
Figs. 4a & b: High Rise intonation pattern for the English utterance **no**



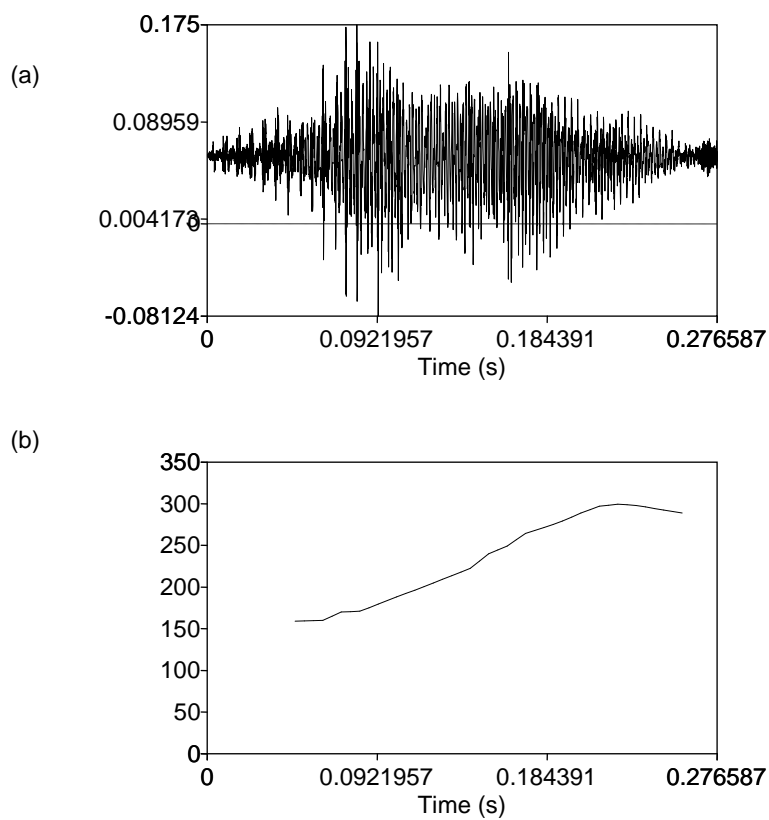
Figs. 5a & b: High Rise intonation pattern for the Ika utterance **n**



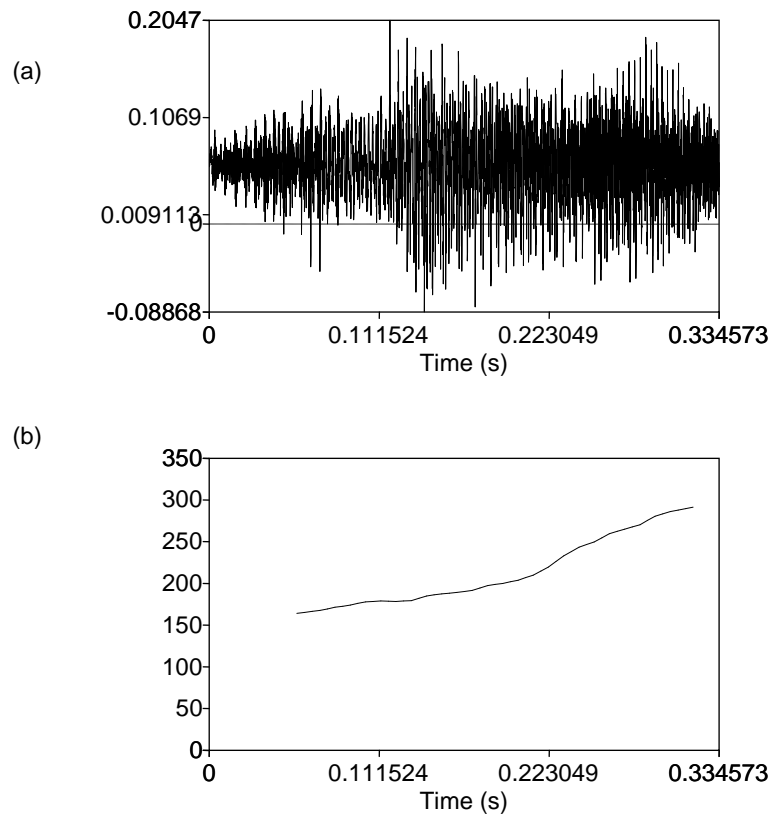
Figs. 6a & b: Low Rise intonation pattern for the English utterance yes



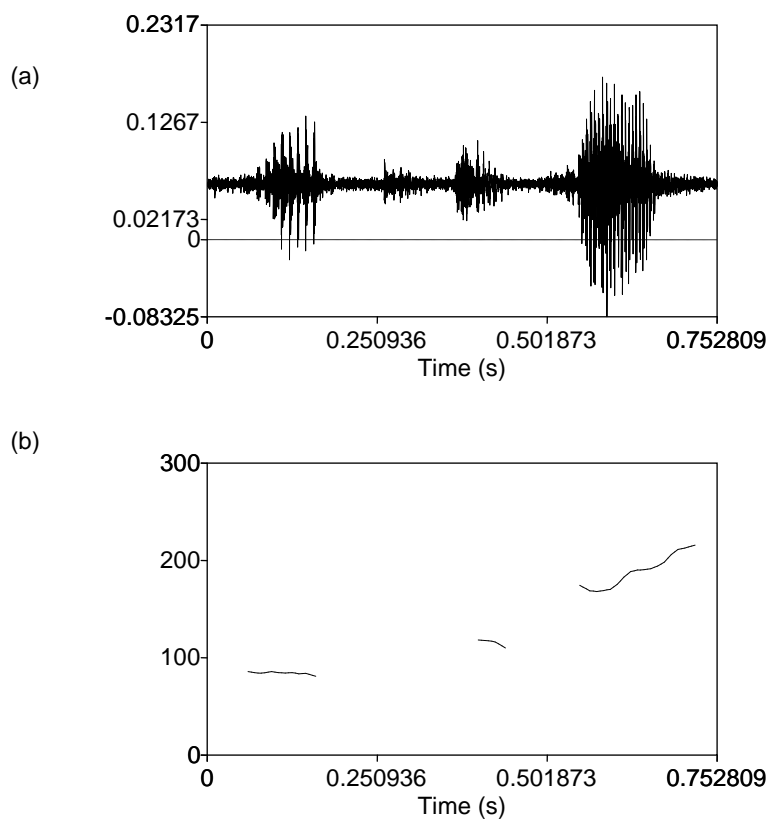
Figs. 7a & b: Low Rise intonation pattern for the Ika utterance **ya**



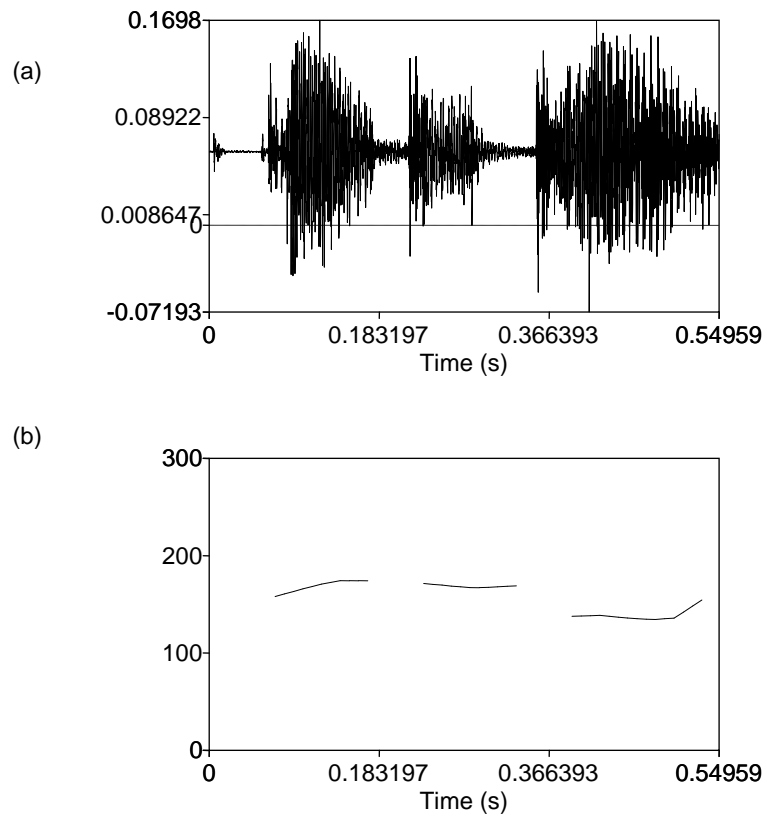
Figs. 8a & b: High Rise intonation pattern for the English utterance **yes**



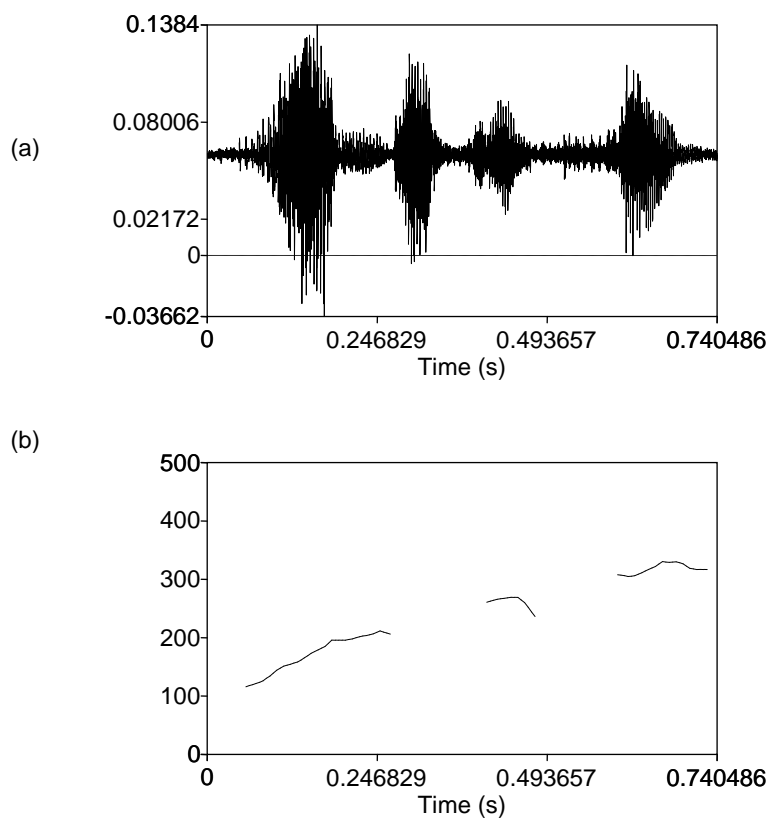
Figs. 9a & b: High Rise intonation pattern for the Ika utterance **ya?**



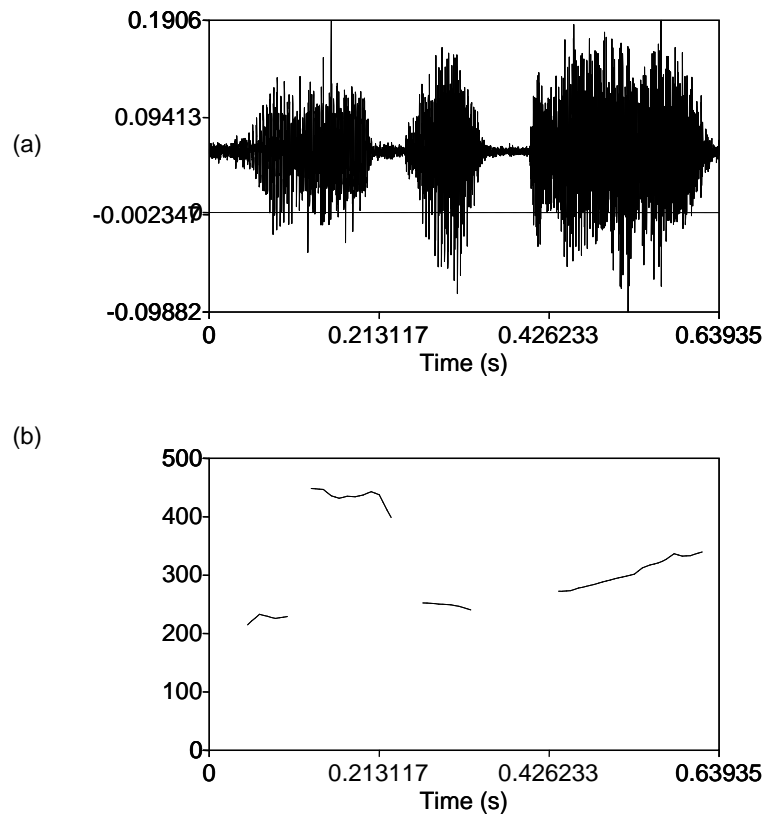
Figs. 10a & b: Low Rise intonation pattern for the English utterance **when did you come?**



Figs. 11a & b: Low Rise intonation pattern for the Ika utterance **we edik**



Figs. 12a & b: High Rise intonation pattern for the English utterance **when did you come?**



Figs. 13a & b: High Rise intonation pattern for the Ika utterance **we edik**

6. FINDINGS AND DISCUSSION

Our discussion centres on the shapes of the curves and the calculation of the minimum and maximum pitch of both intonation patterns (LR and HR) in the two languages under study.

6.1 COMPARISON OF CURVE SHAPES

The curves of the *nu/no* and *ya/yes* utterances bearing the LR tune pattern are actually dissimilar. The two pairs show a gradual rise indicative of the LR. The *nu/no* LR utterances have the beginning of their curves running virtually straight and then gradually rise at the terminus, both ending with upward groove. This similarity indicates that the tune pattern have the same manner of production in both languages. The slight dissimilarity could be because of difference in vowel quality. The *ya/yes* utterances also manifest a high degree of similarity with the curves sliding gradually up in the same direction. Though the contour for the English utterance is disjointed, one can observe the point of rise as is indicated in the diagram with 'R'. In Figures 10

and 11, the similarities in the contours for the pair of LR utterances, **when did you come?** and **we edikŋ** are very evident. The contours are broken into three, each representing a peak of voicing as can be seen from the waveforms. From this similarity, we confirm that English LR is very much similar to Ika's.

The first pair of utterances for the HR utterance, *nu/no* have the same shape of curve for both languages. From Figures 4 and 5, we observe that both curves run slanted from the left to the right. However, there is a little upward groove at the end of the English curve while the Ika curve has a downward groove at the middle. It can be observed that the English and Ika LR utterances for **no** and **nu** have upward grooves at the end of their curves. English HR utterance for **no** retained this groove while the Ika utterance did not do so. This difference could have resulted from the speaker's pitch of voice. A stronger reason for the absence of the groove could be attributable to the difference between English HR and Ika HR. It is observable that consistently, Ika HR monosyllabic utterances used for this study did not have the end groove while the LR ones did. Contrarily, the English HR and LR monosyllabic utterances consistently reflected the end groove. The English LR utterance for **yes**, though disjointed, indicates an end groove, on close observation. In Figures 10 and 11, we have the HR utterances for **yes** and **ya**. The English utterance has a long groove at the end of its curve while the Ika utterance has a downward groove at the centre with an upward tilt at its end, indicative of a rising tune. The fact that Ika HR monosyllabic utterances have downward groove at the middle while those of English have downward grooves at the end of the contour clearly shows the slight difference between Ika HR and English HR. In Figures 12 and 13, we have the English and Ika HR utterances, **when did you come?** and **we edikŋ** respectively. The contours of the two utterances are split into three and four respectively. However, the last streak of the Ika contour is longer than that of English while the first one is much shorter than the first of English. The shortness of the first streak of Ika could be accounted for by the fourth streak which is absent in English. A major remarkable thing to note here is that the English contour has four bands of waveforms with three streaks of contour while the Ika utterance has three bands of waveforms with four streaks of contour. It can be deduced that the striking resemblance in number shows that there are four peaks of voicing in the two utterances but somehow, two waveforms were collapsed in Ika while two streaks of contour were collapsed in English. The elongation of the last syllable of Ika could have resulted in the longest streak seen in the contour. The similarity between these two utterances can be seen in the last streaks of their contours as they both are tilted upwards, indicating rising intonation. From our analysis, we can observe that English LR has a lot of similarities with its Ika counterpart just as the English HR is largely similar to its Ika counterpart. On the other hand, the dissimilarities between their curves indicate why there are slight differences in the way they are perceived in the same way the similarities between the curves confirm why they sound alike.

Contrarily, there is a lot of dissimilarity between LR and HR in both Ika and English. Whereas the curves of the LR utterances in both languages show gradual rise, those of the HR utterances portray sharp rise which could be indicative of the sharpness that goes with the expression of surprise. Surprise is a major attitudinal meaning expressed with the HR intonation pattern. For Ika, the curve of the LR monosyllabic utterances can be distinguished from the HR ones by the downward groove at the middle of the former and the upward groove at the end of the latter. Thus LR and HR pitch curves are distinguishable in the two languages under study.

Nevertheless, the rising curves of both Ika LR and HR confirm that Ika actually has intonation despite the fact that it is a dialect of Igbo, a downdrift tone language. Only in such dialects like Abakaliki, as reported by Ikekeonwu (1986) where we have upstep tones, may one expect slight rising to occur towards the end of utterances. It is also important to point out that upstep does not in any way implicate attitudinal meanings. Thus Ika stands out as one Igbo dialect that manifests tone as well as intonation. Egbeji (1999) and Okorji (1991) have pointed out that there appears to be some manifestations of intonation in Umuchu, an inland West dialect of Igbo. There is however no evidence that the use of intonation in this dialect is as extensive as that of Ika. From the evidence these scholars have shown, it is the upstep tone and what appears to be the Fall Rise tune (but might also be described as a contour tone) which is used for repetitive questions, that exist in Umuchu. Their examples appear below and can be contrasted with intonation as portrayed in Ika utterances in this paper.

Okorji reports that in Umuchu dialect, most utterances end in high tone. She cites some Umuchu and Standard Igbo examples as shown below:

	Umuchu	Standard Igbo	
(20)	í!gbá é!gbé	í!gbá égbè	(shooting of gun)
(21)	òshíshí ú!kwá	òsísí úkwà	(cooking of bread fruit)

She concludes that "listening to a typical Umuchu speaker pronounce the above examples ... will show that the dialect has some intonational qualities which are in form of tones". This report not only appears incorrect, but also sounds ambiguous. This assertion is based on the fact that her examples, as seen above, do not substantiate the fact that Umuchu dialect has features of intonation as obtains in intonation languages. In Standard Igbo, the tones of the first and last syllables of Okorji's examples above would be low. Since the difference in tone neither resulted in change in sentence nor attitudinal meanings particularly, we conclude that intonation is not involved here.

The high tonal ending of Umuchu utterances are neither distinctive in attitudinal meanings nor are they sentence –bound. Rather, they are syllable – bound, which is a typical feature of lexical tone. This is unlike what obtains in Ika. Our test sentences for instance, are whole utterances (sentences) though most of them are monosyllabic sentences. Okorji's illustrations show the feature of upstep tone which is not in any way intonation.

However, Egbeji (1999) indicates that in Umuchu dialect, a declarative sentence can be transformed into an interrogative one by change of intonation without any morpho-syntactic addition. Her examples appear below.

- (22) a. **Chíkā** God is greater
 (22) b. **Chîka ?**
- (23) a. **Nne dī mma.** Mother is good.
 (23) b. **Nnê dī mma?**

Although the author does not specify the gloss of sentences (b) their punctuation indicates that they are interrogatives while sentences (a) are declaratives. Confirming further the use of intonation in expressing questions in Umuchu, a native speaker of

Umuchu dialect was interviewed in the course of this study. The subject was made to say the same dialogue on Chika as cited above. The respondent's pronunciation sounded more like a Fall Rise than a Rise Fall as shown by Egbeji. However, the use of intonation here is more for syntactic purposes (repetitive question) than attitudinal.

6.2 MINIMUM AND MAXIMUM PITCH OF ENGLISH AND IKA UTTERANCES

Generally, the HR utterances in both languages have high starting points. However, those of Ika are higher than their English counterparts. The minimum and maximum pitch values for both LR and HR in both languages are shown in Table I. The values are in hertz.

Table 1: Minimum and maximum pitch for Ika and English utterances

Utterance	Tune	Ika Minimum		Ika Maximum		Eng. Minimum	Eng. Maximum
		I	II	I	II		
Nu/no	Low Rise	167	105	294	121	75	149
Nu/no	High Rise	135	234	327	397	127	322
Ya/yes	Low Rise	159	120	299	138	83	157
Ya/yes	High Rise	165	367	289	479	159	299
we edikÑ/	}						
When did you come? (LR)		134	123	174	129	81	214
we edikÑ/	}						
When did you come? (HR)		220	222	447	240	117	330

Table 2: Minimum and maximum pitch for low toned Ika utterances

		Ika Minimum		Ika Maximum	
		I	II	I	II
äa	Low Rise	136	129	143	139
äa	High Rise	174	167	258	237
äÖ	Low Rise	125	100	181	136
äÖ	High Rise	181	122	281	312

Note that probably because of his voice or individual speech mannerism, the maximum pitch values of the productions of the second Ika speaker are generally

lower than those of English. Apart from these, the tables show that the minimum and maximum pitch for Ika LR and HR are generally higher than those of English. Except in the English HR utterance **yes** which has its maximum pitch as 299Hz and that of Ika as 289Hz, and the LR utterance “when did you come?” with maximum pitch as 214Hz while that of Ika is 174 Hz, the pitch for other Ika utterances are higher than those of English. This could be attributed to the presence of lexical tone in Ika. This confirms the findings of Yanhong, Z., Shawn, L.N., and Alexander, L.F., (2008) from their 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 this influence was because of the existence of lexical tone in Mandarin language as well as the difference between English and Mandarin vowels. Uguru (2000) has previously shown that the interaction between intonation and tone in Ika leaves some effects on the nature of the Ika intonation and vice versa. One of such effects is the overlapping or merging of tone and intonation - when both occur on one syllable. In other words, there may be an overlap and each is adjusted to enable the other be pronounced. In this way, there may be heightened pitch owing to the merging of two ‘different’ intonation systems. The tone determines the level of pitch from where the intonation takes off; thus the speaker adjusts his/her vocal cords in readiness to produce that pitch but also makes room to accommodate the intonation. Another effect is the overshooting of tone or intonation. Intonation could be overshoot depending on the tone of the nucleus. Hence Ika LR on a nucleus with a high tone would have a higher pitch than the one on a low – toned nucleus. This can be observed from Table 1 where the minimum and maximum pitch of the Ika utterance, **we edikÑ** are much lower than those of the high-toned monosyllabic utterances. However, the overshooting of HR intonation in Ika HR utterance, **we edikÑ** is such that the pitch soars so much above the low tone of the nucleus. This is due to the attitudinal meaning associated with the HR – surprise and emphasis. These attitudes go with loudness thus the great overshooting without however obliterating the low tone.

In Table 2, it can be observed that low-toned **nÔwarm**’ has a lower pitch than the high toned **nÔhear**’ in table 1. Nonetheless, the low toned **nÔ** is still higher in pitch than English **no**. Its pitch is high for the two Ika informants when compared to the pitch of the English utterance, *no* as seen in Table 3.

Table 3: Minimum and maximum pitch for Ika low toned utterance **nÔ**
Comparison with those of English utterance **no**

Utterance	Tune	Ika Minimum		Ika Maximum		English Minimum	English Maximum
		I	II	I	II		
nÔno	Low Rise	125	100	181	136	75	149
nÔno	High Rise	181	122	281	312	127	322

From the table above, we see that the Ika utterances have higher pitch than the English utterance. The **nÔ** utterance has been selected for this comparison because it is closer to the English utterance, **no** than **Ña**. It can be observed that the minimum pitch for both Ika informants is higher than that of the English. However, the maximum pitch of the second informant particularly is generally lower than that of the English informant. In

fact the maximum pitch of the second speaker for most of the utterances is relatively low. This could be attributed to the nature of his voice or state of mind. The fact, however, that his minimum pitch is generally higher than that of the English informant confirms the conclusion drawn from the analysis of the first Ika speaker's pronunciation that Ika LR and HR have higher pitch than their English counterparts. In Table 4 below which shows the analysis of **nŋo** utterances, the higher pitch of the Ika intonation patterns is evident.

Table 4: Minimum and maximum pitch for Ika and English **nŋ/no** utterances

Utterance	Tune	Ika Minimum		Ika Maximum		English Minimum	English Maximum
		I	II	I	II		
Nŋ/no	Low Rise	167	105	294	121	75	149
Nŋ/no	High Rise	135	234	327	397	127	322

6.3 INTRA-LANGUAGE COMPARISON OF THE CURVES AND PITCH VALUES

On the differences in pitch among (or between) the tune patterns, LR and HR, within the individual languages, the minimum and maximum pitch of English LR are generally lower than those of HR in the same language. The pitch difference between Ika LR and HR is not as regular as that found in English. Though it can be said that the minimum and maximum pitch of Ika LR is generally lower than those of Ika HR, it is observed that the minimum pitch of the **nŋ** LR utterance is higher than that of **nŋ** HR. This is attributable to the speaker's pitch of voice or emotional state since the LR is used as an emphatic tune especially when it is denoting a syntactic as well as an attitudinal function. Also, one may not readily determine why the maximum pitch of **ya** LR is higher than that of its HR counterpart except that it could be that the speaker's pronunciation was louder than usual. This conclusion is drawn from the fact that in the context of the utterance, **ya**, LR cannot be said to be denoting both syntactic and attitudinal meaning but rather solely attitudinal. Levis (2002) distinguishes between two types of LR – LLH and LHH. The conclusion, therefore, is that LR with high minimum and maximum pitch, fall under LHH, with that of Ika being predominantly in this category. English LR on the other hand, appears to be predominantly LLH. The relative lowness in English minimum and maximum pitch authenticates this conclusion. It is however important to note that in both languages, the two intonation patterns end with higher pitch than they started, indicating their rising nature. This makes for similarity. The curves of LR and HR in both languages are basically similar as can be seen from their rising shape. However, HR curves tend to slant more sharply. LR curves show gradual rise as can be seen from their beginning points which is usually virtually flat as can be seen even from the pitch contours of the first and second speakers of Ika shown below.

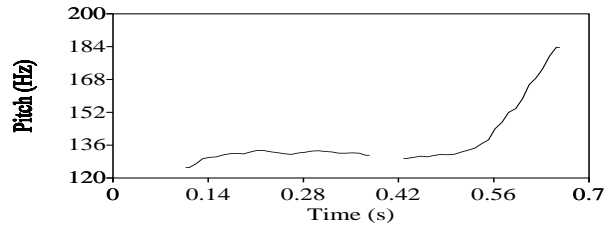


Figure. 14: Low Rise Intonation pattern for Ika utterance, **äŃ** speaker 1)

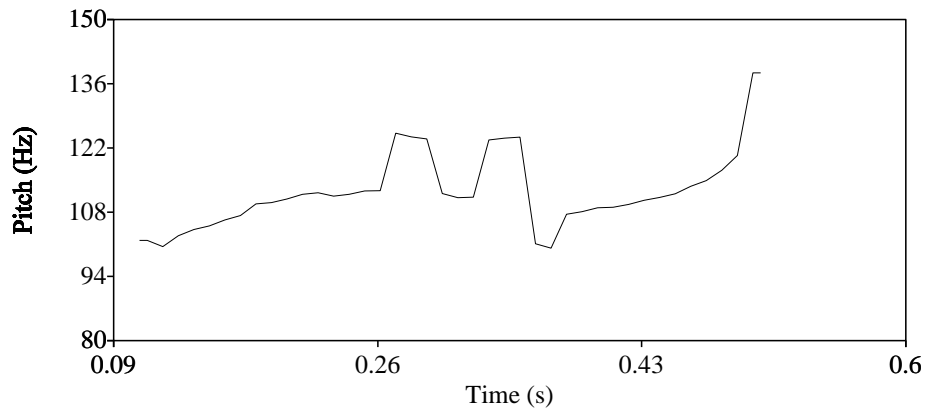
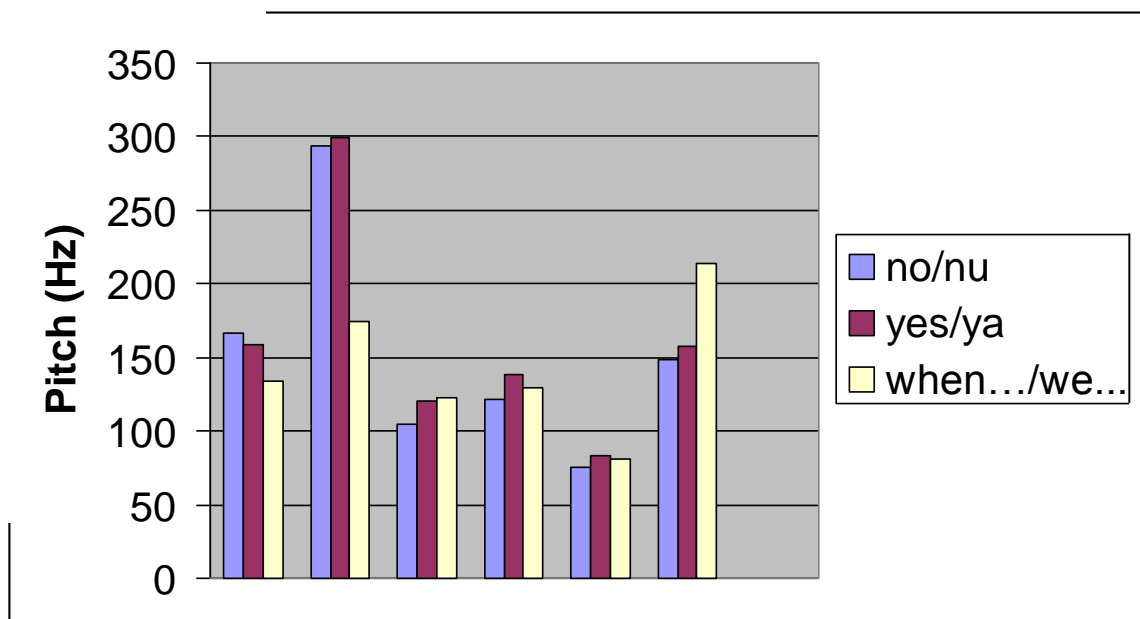


Fig. 15: Low Rise Intonation pattern for Ika utterance, **äŃ** speaker 2)

This is also observable in all the utterances in both English and Ika (Figures 2 – 13). There is a strong similarity in the differences observable between English HR and LR on the one hand and Ika HR and LR on the other. A second language learner with the knowledge of this similarity is better equipped to properly adjust the vocal cords in order to get the right pitch range of English tunes. The chart below gives a pictorial summary of the similarity of these tunes in both languages.



Ika 1 Ika 1 Ika 2 Ika 2 Eng Eng
 min max min max min max

Figure.16: Minimum and maximum pitch for English and Ika LR

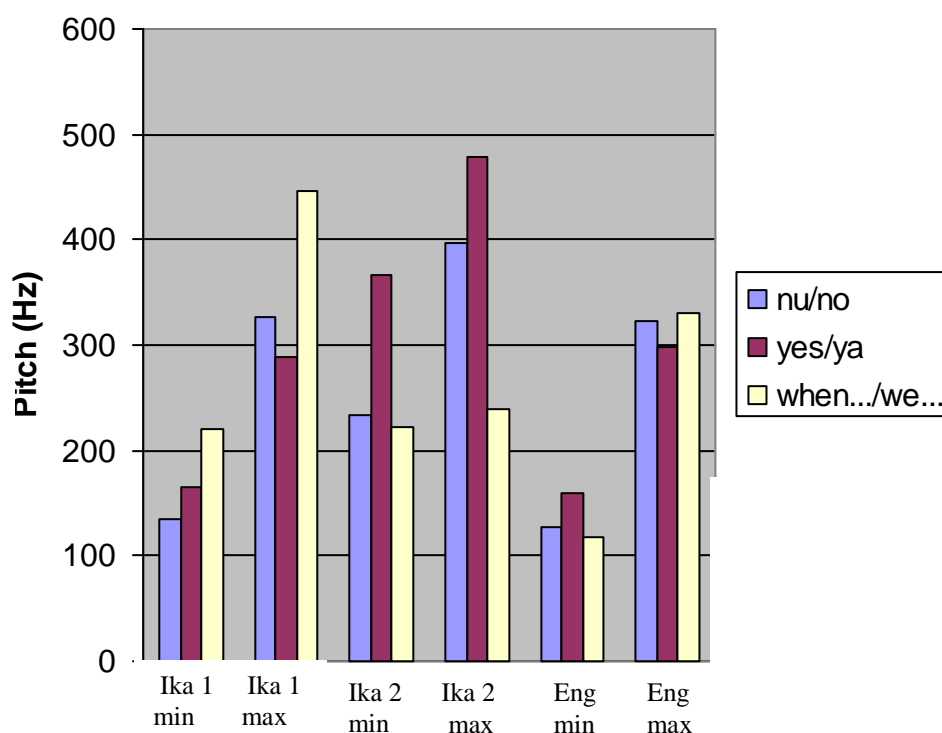


Figure. 17: Minimum and maximum pitch for English and Ika HR

The charts above (Figures 14 and 15) reveal the characteristics of the tunes, LR and HR, in the two languages as already discussed. The charts show that Ika and English HR have nearer pitch range than their LR counterparts. This is observable from their minimum and maximum pitch bars. Thus it can be concluded that English and Ika HR share greater similarity than their LR counterparts.

7. SUMMARY AND CONCLUSION

So far, it has been established that Ika LR and HR generally have higher pitch than those of English. This difference is attributable to the difference in the attitudinal function of the LR and HR in the two languages. Despite their difference in pitch these tunes are generally similar, in the two languages, considering the fact that their curves move from lower pitch to higher one, indicating their rising nature. On the other hand, there is a lot of difference between the LR and the HR in the individual languages. This can be seen from the sluggish rising of LR, the comparative sharper rise of HR contours as well as the difference in their pitch values.

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