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Original Paper

Monophthongisation and Vowel Lengthening in Educated Ibibio English

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Abstract

The major preoccupation of this paper is to study monophthongisation and vowel lengthening in Educated Ibibio English with a view to explaining the lengthening of vowels in final open stressed syllables. Educated Ibibio English (here after EIE) is an ethnic variety of Nigerian English spoken by literate home-grown Ibibio people in Akwa Ibom State, Nigeria. Monophthongisation is a phonological process whereby one of two vowel elements of a diphthong, usually the second (offset) element, is deleted, leaving the stranded stressed (onset) to be lengthened, if found in final open, stressed syllable. Related works on EIE segments indicate that some Standard British English (SBE) closing diphthongs /əu/ and /ei/ tend to monophthongise to /e/ and /o/, respectively. The study employs the Moraic Theory of Hyman and Hayes which main argument is that the syllable contains neither onset or a rhyme. Rather, every syllable contains one or more Mora. Also, a Speech Filling System (SFS/WASP) Computerized Speech Laboratory was used to interpret Fo curve structure and acoustic duration in order to corroborate findings from perceptual analysis. The study establishes the fact that the monophthongised diphthongs were lengthened becuaseof the need to preserve the weight of the deleted /u/ and /i/ in SBE /ei/ and /əʊ/ diphthongs and also to reflect components of the failing fundamental frequency (Fo) contour of English fnal open syllable.

Keywords

Monophthongisation, diphthongisation, vowel lengthening, syllable weight

1. Introduction

Several researches have accounted for the situation of the English language since its arrival in Nigeria (Eka, 2000; Bamgbose, 1995; Ike, 2001; among others). Such researches attest to the fact that the English language, having remained in Nigeria for quite a long time, has acquired certain identifiable features that are particularly Nigerian. Some other studies have revealed some peculiarities, which are

identifiable with the Nigerian English variety (Jibril, 1979, 1982; Eka, 1985, 2000; Udofot, 1997, 2004, 2007).

The English spoken by the Ibibio is a sub-variety of Nigerian English (NE) which may be described as the language spoken by semi-literate and literate Ibibio people in Akwa Ibom State, Nigeria. We use the term Educated Ibibio English (EIE) in this paper to refer to a form of spoken English used by home-grown literate Ibibio people.

Literature on monophthongisation and vowel lengthening in EIE is scanty if not rare; but literature on Ibibio phonology abound. Some of these studies include Essien (1990), Urua (2000), Josiah (2009) and Essien (2000). Not much attention has been given to the aspects of monophthongisation and lengthening in the speech of Educated Ibibio speakers of English. This study, therefore, seeks to analyse the monophthongisation and vowel lengthening in EIE with a view of identifying and explaining the motivation for the lengthening. It is observed that Ibibio speakers of English usually reduce English diphthongs to monophthongs with the centering diphthongs presenting much of the pronunciation problems. Educated Ibibio English data tested in this work indicates that there is a natural tendency for [e] and [o] to acquire some extra length whenever /ei/ and /əʊ/ have been reduced through the process of monophthongisation, also referred to as vowel reduction rule. From the statistical analysis this work shows that only a few Ibibio English respondents preferred preserving the diphthongs by articulating, them as [ei] and [eu]. We are left to wonder why do [e] and [o] lengthen because of the deletion of /i/ and /əu/. This paper therefore, explains the motivation for the "lengthening" of the stranded element of /ei/ and /əʊ/. In order to carry out this analysis, Hyman and Hayes theory of mora is employed.

2. A Survey of Standard British English and Ibibio Vowel Systems

Studies on the English vowel systems abound in the literature (Udofot, 1997; Roca & Johnson, 1999, Egbokhare, 1994, Roach, 2000, Akinjob, 2000, among others). SBE has 25 vowels which are subdivided into three groups: monophthongs, diphthongs and triphthongs. Monophthongs also known as pure vowels are without observable change in quality in a syllable (Crystal, 2005). They are composed of seven short vowels /i, e, æ, ɒ, ʊ, ʌ/ and five long vowels, namely / iː, aː, ɔː, uː, ʒː /. Diphthongs and triphthongs, on the other hand, are vowels which change in quality. There are eight diphthongs, namely /ei, ɑi, ɔi, əʊ, iə, au, uə / while there are five triphthongs as follows / eiə, ɑiə, ɔiə, əʊə, ɑʊə /.

According to Essien (1990:30), Ibibio has ten vowels while Urua (2000) analyse sixteen vowels in Ibibio. According to Urua, Ibibio does not have diphthongs but "a" sequence of vowels and glide consonants. The sequence includes / ii, ee, aa, ɔɔ, oo, uu /. From the above brief descriptions of diphthongs on SBE and Ibibio, it is clear that Ibibio does not have diphthongs in its phonology; hence, the substitution of SBE /əʊ/ and /ei/ with [o] and [ei]. As a result, EIE diphthongal system has strong Ibibio influence.

3. Theoretical Framework

3.1 The Moraic Theory

The Moraic theory was first proposed by Hyman and advanced by Hayes in Yana and other languages. Essentially, the theory sprang up due to the fact that the skeletal tier fails to account for two phenomena (Hayes, 1989) cited in Gussenhoven and Jacobs (2011, p. 148) as to what the internal representation of the syllable should be like in languages. One of such phenomenon, according to Gussenhoven and Jacobs, (2011, p. 148) is "that compensatory lengthening always occurs in the case of segment deleted from the rhyme, never in the case of segments deleted from the onset". Again, the source observes that "many languages distinguish syllables on the basis of "quantity". This is a property of syllables which is determined by the number of segments in the rhyme without onsets. The second phenomenon is the "location of the word stress frequently appears to be sensitive to the segmental composition of the rhyme, while the number of segments in the onset is irrelevant" though there are few exceptional and incidental cases".

In order to capture the difference in status between segments in the rhyme and segments in the onset, the mora has been proposed as an intermediate level of structure between segments and the syllable. Under the moraic approach, it is believed that the syllable contains neither an onset nor a rhyme. Rather, every syllable contains one or more moras (Hyman, 1985).

Some phonologists who have worked in this area are of the opinion that a syllable's quantity or duration is a function of its number of weight-bearing units, "moras", which are represented with the Greek letter "μ" (McCarthy & Prince, 1986; Vago, 1989, 1992; Broselow, 1992; Kager, 1999). Since there is a strong interrelationship between the subject of phonology weight, phonological quantity and the mora, the mora is seen to be a unit that must be encoded in the phonological weight theory (Utulu, 2013, p. 84). There are many scholarly works on the concept of "syllable weight" theory. For instance, Allen (1973) has suggested that certain syllable types are light while some are heavy, and others even comparatively heavier, and these variations determine the application of certain phonological processes, like stress assignment.

Hyman (1985) and Hayes (1989) also assigned short vowels to one mora, which are read off on the weight scale as "light syllable". In like manner, they ascribed long vowels, diphthongs and vowel-plus-coda sequence to two moras and labelled them "heavy syllable". By implication, according Utulu (2013), the criteria for the computation of phonological weight are predicated on the following:

1. the quality/quantity of vowel, i.e., long vowel versus short vowels; diphthongs versus monophthongs;
2. a closed syllable, i.e., a CVC syllable structure tagged "Weight-By-Position" by Hayes; and
3. the number of moras represented in the moraic template.

Structural Definition of Syllable Weight

	Light	Heavy	Heaviest
Type 1	Non-branching rhyme		Branching rhyme
Type 2	Non-branching nucleus		branching nucleus
Type 3	Non-branching rhyme	branching rhyme	branching nucleus

The above structure is based on the internal structure of the syllable rhyme, as indicated by Blevins (1995, p. 215). We can generate moraic template from these structural definitions of phonological weight following Hayes (1989) as in Figure 1 below:

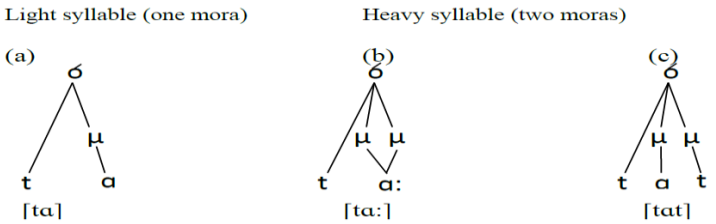

Figure 1. Moraic Templates Showing Different Weight Types

The above templates illustrate that a short vowel defines a light syllable and has one mora, whereas a long and closed vowel indicates a heavy syllable and they have two moras. Above all, the templates also show that the prevocalic consonant [t] in [tɑ], [tɑ:] and [tɑt], functions as an onset and as such does not take part in the computation of the mora since it attaches directly from the syllable node and not from the mora node. Hyman describes onset consonant as moraless and as such is exempted from the computation of phonological weight. As observed earlier, all duration, quality or weight-related processes are accounted for in the domain occupied by moras within the syllable rhyme. This domain is referred to as "prosodic frame" (Hayes, 1989).

In analysing compensatory lengthening in Yana, Hayes states that it is precisely the prosodic frame that indicates the domain where the segment that is deleted and the one that lengthens compensatorily apply. The template of the prosodic frame is shown in Figure 2 below.

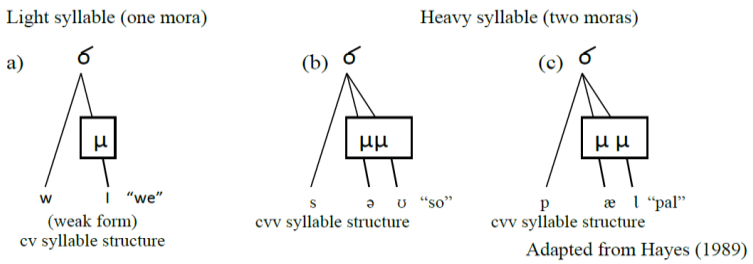

Figure 2. Moraic Template Showing Prosodic Frame

According to Hayes, moraic template, as presented in Figure 2 above, suggests that the weak form of the English vowel /i/ in "we" /wi/ is presented as a light syllable due to the fact that it is a short vowel, it must be assigned one mora. The diphthong /əʊ/ in "so" /səʊ/ and the portion of the cvc syllable structure in "pal" /pæl/ are designated as heavy syllables and are assigned two moras. The boxed- off portions (a - c) which are the prosodic frame show those segments that were deleted and the ones that were subsequently lengthened compensatorily. Hence, the distinction between light and heavy syllables are obvious. Thus, according to Utulu (2013), the theory of mora "has a mechanism through which weight dependent processes such as diphthong monophthongisation and vowel lengthening processes can be transparently accounted for". This study also adopts the principles of maraic theory in the analysis of monophthongisation and vowel lengthening in relation to educated spoken Ibibio English.

4. Research Methodology

Forty educated Ibibio speakers of English who are postgraduate students at the University of Uyo, Uyo were used as respondents for the study while a respondent who was born and has lived in Britain served as the control. Level of education was used as the yard stick to determine the fluency and proficiency in the use of English by the non-native English speakers. Our observation revealed that the respondents use Ibibio as first language since that is their linguistic community. The test items for the study included the closings diphthongs /ei/ and /əʊ/ found in final open syllables from SBE. Twenty (20) word-items from each of the diphthong were used totalling forty (40) in the study, and they were read by forty (40) respondents into a Zoom model H4n Handy Recorder. The respondents' voices were later anaylsed using speech filing system. The test items were also administered to the control whose pronunciation was used as the expected frequency.

Simple percentage was used to calculate the difference between the respondents performance and the control's. This was to ascertain whether there is a significant difference in the pronunciation of EIE respondents and that of the control of /əʊ/ and /ei/. Most importantly, the statistical analysis was to determine those who monophthongised and lengthened the closing diphthongs /əʊ/ and /ei/ respectively, and those who did not but decided to preserve the quality of the diphthongs. In the perceptual analysis of the data, Acoustic analysis was also carried out both on the EIE respondents' performance and the control's performance on [o] and [e] and /o/ and /e/ respectively. The control's fundamental frequency (Fo) and duration (time) performance on /eʊ/ and /ei/ were measured and were compared with that of the EIE respondents' performance in the pronunciation of [əʊ] and [ei].

5. Data Presentation

Tables 1 and 2 show the realisation of /ei/ and /əʊ/ in an open syllable by Educated Ibibio English (EIE) respondents and that of the control. The control's realisation of each item tested is enclosed in slanting lines "/ /", while the EIE respondents' performance is enclosed in square brackets "[ ]".

Table 1. Test on SBE Pronunciation /ei/ in Final Open Syllable

	English Items	Control (SBE) Pronunciation	Subjects (EIE) Variant	Subjects (EIE) Alternative Variant
1	foray	/fərei/	[fəre]	[fəree]
2	slay	/slei/	[sle]	[slee]
3	Tray	/trei/	[tre]	[free]
4	pay	/pei/	[pe]	[pee]
5	Bay	/bei/	[be]	[bee]
6	stay	/stei/	[ste]	[stee]
7	way	/wei/	[we]	[wee]
8	clay	/klei/	[kle]	[klee]
9	day	/dei/	[de]	[dee]
10	nay	/nei/	[ne]	[nee]
11	pray	/prei/	[pre]	[pree]
12	prey	/prei/	[pre]	[pree]
13	lay	/lei/	[le]	[lee]
14	fray	/frei/	[fre]	[free]
15	ray	/rai/	[re]	[ree]
16	may	/mei/	[me]	[mee]
17	say	/sei/	[se]	[see]
18	gay	/gei/	[ge]	[gee]
19	spray	/sprei/	[spre]	[spree]
20	stay	/stei/	[ste]	[stee]

Table 2. Test on Pronunciation of SBE /əʊ/ in Final Open Syllable

	English Items	Control (SBE) Pronunciation	Subjects' (EIE) Variant	Subjects' (EIE) Alternative Variant
1	arrow	/ærəʊ/	[aro]	[aroo]
2	show	/ʃəʊ/	[ʃo]	[ʃoo]
3	pillow	/piləʊ/	[pilo]	[piloo]
4	blow	/bləʊ/	[blo]	[bloo]
5	grow	/grəʊ/	[gro]	[groo]
6	throw	/θrəʊ/	[θroo]	[θroo]
7	borrow	/bɒəʊ/	[baro]	[boroo]
8	low	/ləʊ/	[lo]	[loo]
9	cargo	/ka:gəʊ/	[ka:go]	[ka:goo]
10	ego	/igəʊ/	[igo]	[igoo]
11	window	/windəʊ/	[windo]	[windoo]

12	below	/biləʊ/	[bilo]	[biloo]
13	tow	/təʊ/	[to]	[too]
14	bow	/bəʊ/	[bo]	[boo]
15	Foe	/fəʊ/	[fo]	[foo]
16	go	/gəʊ/	[go]	[goo]
17	mellow	/meləʊ/	[melo]	[meloo]
18	rainbow	/reinbəʊ/	[reinbo]	[reinboo]
19	sow	/səʊ/	[so]	[soo]
20	shadow	/ʃadəʊ/	[ʃado]	[ʃadoo]

From the data presented in Tables 1 and 2, it would be observed that in an open syllable, as mentioned earlier, the SBE closing diphthongs may be realised as long monophthongised diphthongs and as diphthongs but with slight alternatives in vowel quality. From the statistical analysis presented below, the diphthong occurs less frequently as a marked option.

5.2 Data Analysis

5.2.1 Statistical Analysis

Perceptually, on column three Tables 1 and 2 typifies EIE monophthongisation and vowel lengthening processes. Simple percentage is used to compare the respondents' performance and that of the control's. As the two homogenous complex vowels are concerned, there are marked differences between SBE and EIE as presented in Tables 3, 4, 5 and 6 below.

Table 3. Analysis of Respondents' Comparative /ei/ Pronunciation

Items	Control's Pronunciation	(EIE) Variant	Expected Score	Actual Score	Percentage Score
forey	/fərei/	[fəre]	40	34	85.0%
		[fərei]		6	15%
Slay	/slei/	[sle]	40	38	95%
		[slei]		2	5.%
tray	/trei/	[tre]	40	40	100%
		[trei]		0	0.0%
pay	/prei/	[pe]	40	35	87%
		[pei]		5	12.5%
bay	/bei/	[be]	40	40	100%
		[bei]		0	0.0%
stay	/stei/	[ste]	40	40	100%
		[stei]		0	0.0%
way	/wei/	[we]	40	38	95.0%
		[wei]		2	5.0%
clay	/klei/	[kle]	40	40	100%

		[klei]		0	0.0%
play	/plei/	[ple]	40	36	90.0%
		[plei]		4	10.0%
day	/dei/	[de]	40	40	100%
		[dei]		0	0.0%
nay	/nei/	[ne]	40	40	100%
		[nei]		0	0.0%
pray	/prei/	[pre]	40	38	95.0%
		[prei]		2	5.0%
prey	/prei/	[pre]	40	38	95.0%
		[prei]		2	5.0%
say	/sei/	[se]	40	40	100%
		[sei[		0	0.0%
fray	/frei/	[fre]	40	40	100%
		]frei]		0	0.0%
ray	/rei/	[re]	40	40	100%
		[rei]		0	0.0%
May	/mei/	[me]	40	38	80.0%
		[mei]		2	20%
Say	/sei/	[se]	40	38	95.0%
		[sei]		2	5.0%
Gay	/gei/	[ge]	40	40	100%
		[gei]		0	0.0%
spray	/sprei/	[spre]	40	40	100%
		[sprei]		0	0.0%

Table 4. Respondents' Overall Comparative Pronunciation on /ei/ - Monophthongisation and Lengthening

Overall Analysis of the Tokens		Percentage Score
Overall percentage score	800	100%
Respondents' overall score for [e]	767	95.8%
Respondents' overall score for [ei]	33	4.1%

Table 5. Analysis of Respondents Comparative /ei/ Pronunciation

Items	Control's Pronunciation	(EIE) Variant	Expected Score	Actual Score	Percentage Score
arrow	/arəʊ/	[aroo]	40	40	100%
		[arəʊ]		0	0.0%
Show	/ʃəʊ/	[ʃoo]	40	37	92.5%

		[ʃəʊ]		3	7.5%
Pillow	/piləʊ/	[piloo]	40	40	100%
		[piləʊ		0	0.0%
Blow	/bləʊ/	[bloo]	40	40	100%
		[bləʊ]		0	0.0%
grow	/grəʊ/	[groo]	40	39	97.5%
		[grəʊ]		1	2.5%
Throw	/θrəʊ/	[θroo]	40	37	92.5%
		[θrəʊ]		3	7.5%
Borrow	/barəʊ/	[bɒroo]	40	40	100%
		[bɒrəʊ]		0	0.0%
Low	/ləʊ/	[loo]	40	39	97.5%
		[ləʊ]		1	2.5%
Cargo	/ka:gəʊ/	[ka:o]	40	38	95.0%
		[kaa:gəʊ]		2	5.0%
Ego	/igəʊ/	[igoʊ]	40	40	100%
		[igəʊ]		0	0.0%
Window	/window/	[windoo]	40	40	100%
		[windəʊ]		0	0.0%
below	/biləʊ/	[biloo]	40	40	100%
		[biləʊ]		0	0.0%
tow	/təʊ/	[too]	40	37	92.5%
		[təʊ]		3	7.5%
bow	/bəʊ/	[bou]	40	40	100%
		[bəʊ]		0	0.0%
Foe	/fəʊ/	[foo]	40	40	100%
		[fəʊ]		0	0.0%
go	/gəʊ/	[goo]	40	40	100%
		[gəʊ]		0	0.0%
melow	/meləʊ/	[meloo]	40	39	97.5%
		[meloo]		1	2.5%
rainbow	/reinbəʊ/	[reinbəo]	40	38	95.0%
		[reinboʊ]		2	5.0%
sow	/səʊ/	[soo]	40	40	100%
		[səʊ]		0	0.0%
shadow	/ʃædəʊ/	[ʃadoo]	40	40	100%
		[ʃadəʊ]		0	0.0%

Table 6. Respondents' Overall Comparative Pronunciation of /əʊ/ - Monophthongisation and Lengthening

Overall Analysis of the Tokens		Percentage Score
Overall percentage score	800	100%
Respondents' overall score [oo]	784	98.0%
Respondents' overall score [əʊ]	16	2.0%

From the data presented in Tables 3, 4, 5 and 6, it is evident that the respondents' actual overall score for the lengthening of vowel [oo] through the process of diphthong monophthongisation is 784 tokens of the expected 800 while [e] is 767 token of 800 anticipated. Both percentage scores are therefore 98.0% and 95.0% respectively. This clearly shows that EIE respondents are more predisposed to articulating long monophthong to diphthongs.

5.2.2 Moraic Analysis

The Moraic theory is used in this study to account for the feature of length in EIE [o] and [e] monophthongs since, according to Hyman and Hayes, the length or quality of a syllable nucleus/rhyme is a factor of the number of its weight-bearing units or moras (= μ).We adopt the moraic template presented in Figures 2, 3 and 4 below to explain the lengthening on [o] and [e] to become [ee] and [oo] using the words "way" and "show".

Rule I: Reduction (monophthongisation) of /əʊ/ and /ei/ through deletion or epenthetic rule in "show" and "way" respectively

From the words "show" /ʃəʊ/ and "way" /wei/, the diphthongs have been reduced by dropping /ʊ/ and /i/ respectively. This is presented in the moraic representations in Figures 3a and b below.

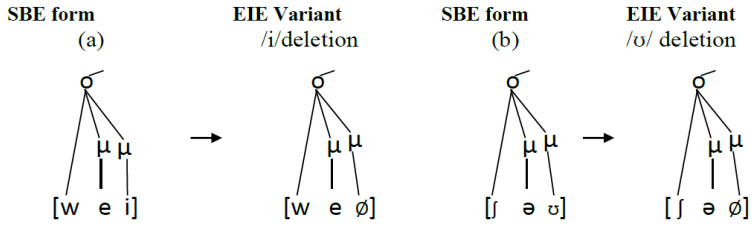

Figure 3. Reduction (Monophthongisation) of /əʊ/ and /ei/ to /o/ and /e/ through Deletion Rule

Figures 3a and b, /ei/ and /əʊ/ have two moras. By implication, these closing diphthongs /ei/ and /əʊ/ are heavy syllables. These observations align with the views of the proponents of the weight and moras theories. From the diagram above, the deletion of the second element of each of the diphthongs is evident. Through the deletion rule, it is also observed that though the /ʊ/ and /i/ have been removed, their respective mora still remains constant or stable. This phenomenon, according to Utulu (2013, p. 91) and Gussenhoven and Jacobs (2011) is describe as "mora stability" which leads us to the next phase

of the structural change.

Rule 2: Creation of gap in the domain of the vacated mora due to deletion of /u/ and /i/.

When /u/ and /i/ are deleted, a gap is created in the domain of vacated mora.

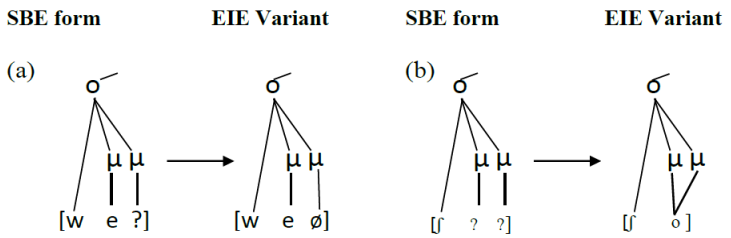

Figure 4. Creation of Gap in the Domain of the Vacated Mora via /u/ and /i/ Deletion

From the above structure, it is observed that the second mora in "way" and "show" have been deleted and gaps are left. The gaps must be filled, and these lead to the next phase in our discussion.

Rule 3: Vacated mora is filled with length superimposed on stranded vowels of the first mora.

As noticed in Rule 2, Figure 4, the vacated mora is filled by superimposing "length effect" on the stranded vowel [o] and [e]. Consequently, both elements are turned to [oo] and [ee] respectively, as presented on the moraic template in Figures (5) and (6).

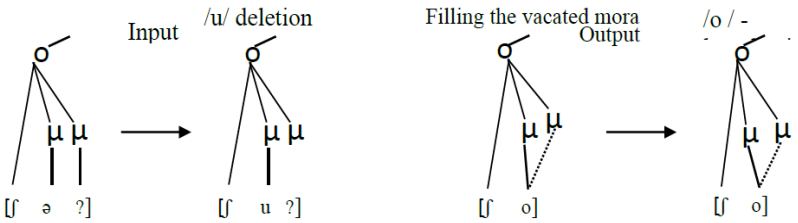

Figure 5. Vacated Mora is Filled with Length Superimposed on /e/ to Become Indigenised /ee/

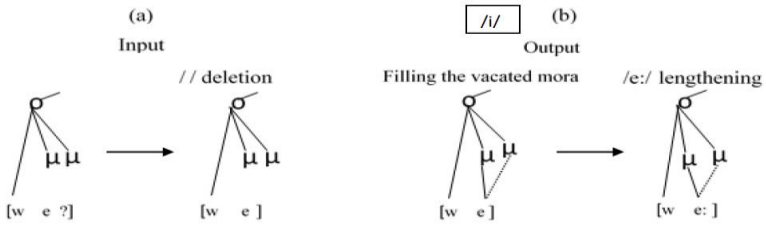

Figure 6. Vacated Mora is Filled with Length Superimposed on /e / Turned [ei] to Become Indigenized [o]

Following the theory used in this study, vowel lengthening occurs due to some compelling reasons such as:

1. the need to preserve the weight of the deleted /u/ and /i/, in SBE /ei/ and /əʊ/ diphthongs;
2. to reflect components of the falling fundamental frequency (Fo) contour of English final open

syllables.

This is illustrated in Figure 7 thus:

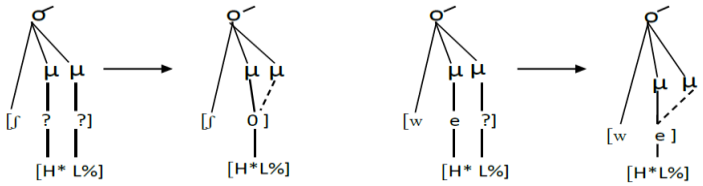

Figure 7. Lengthening of [o] and [e] to [oo] and [ee] as a Strategy to Preserve the Falling Fo of on SBE /əʊ/ and /ei/ in "Show" and "Way"

Evident in Figure 7 is the fact that the EIE long [ee] [oo] is said to be approximately equivalent to SBE /ei/ and /əʊ/ quantitatively. This is clearly captured in the mora theory of the assumption (Hyman, 1985; Hayes, 1989) which indicates that quantity/weight of a segment is determined by the mora. An observation shows that SBE diphthongs and the EIE allophonic long vowels are directly linked to two moras. Again, the gliding effect of the Fo on SBE vowel, with the two articulatory targets is preserved in EIE long vowels which typifies the structure of contour tone in tone languages.

6. Acoustic Analysis

To ascertain the claim of Fo preservation as we previously discussed, we present the spectograph of the speech filling system (SFS/WASP) Computerised Speech Laboratory. The spectograph indicates the Fo tracing of the input diphthongs and long vowels as can be seen below.

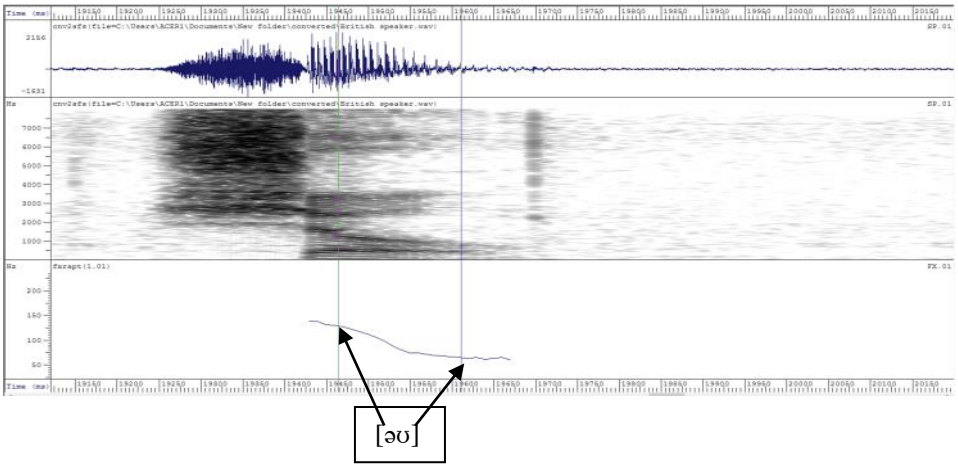

Figure 8. Control's Pronunciation of "Show"

Indicated in the spectograph above, is the rise on /ə/ in the control's pronunciation, which measures 140Hz (Hz = unit of measurement of frequency) with a gradual fall on /ʊ/ measuring 70Hz. Moreover from the point of the rise to the fall, the duration measurement is 0.21ms (ms = milliseconds).

It is also observed that the same Fo rise-fall contour can be seen in the control's production of /ei/ in Figure 9. Notice the rise begins from the first segment /e/ which measures 110Hz and gradually drops on the second segment /i/ with an Fo measurement of 75Hz. Duration measurement from the point of rise to the fall is 0.146ms as shown above. The rise represents the peak (H*) while the fall (L%) represents the terminal point of the falling Fo.

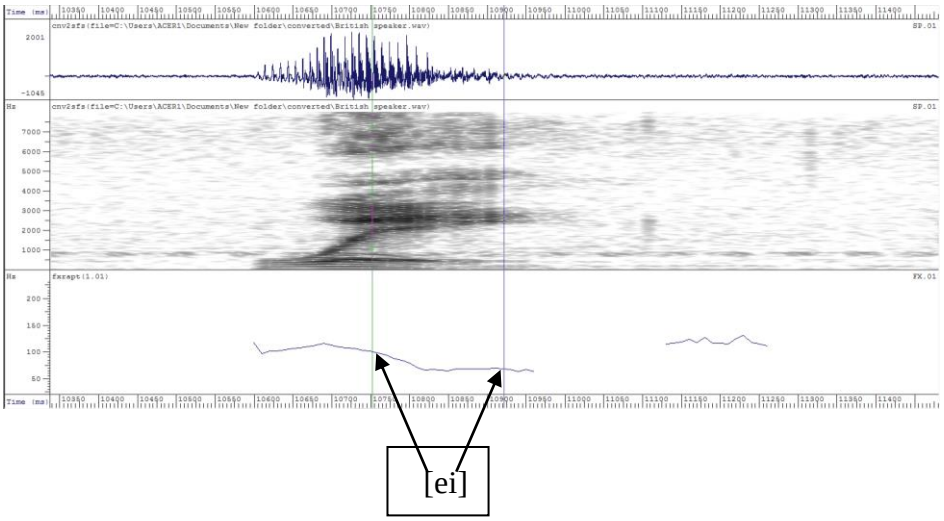

Figure 9. Control's Pronunciation of /ei/

From the foregoing analysis of the control's performance on /əʊ/ and /ei/ comparatively it is observed that in Educated Ibibio speaker's performance, the same leftward rise-fall Fo contour structure holds. Compare the control's pitch contour above with EIES respondents from the spectograph below, despite the absence of the second segment of the diphthongs which have been removed by deletion rule, the rise fall contour is still in place. This can be seen in the spectograph above. The performance of the respondents Fo peak on [əʊ] is 100Hz and the fall 95Hz while the durational measurement from the point of the rise (as the segmented line indicates) at the fall is 131ms.

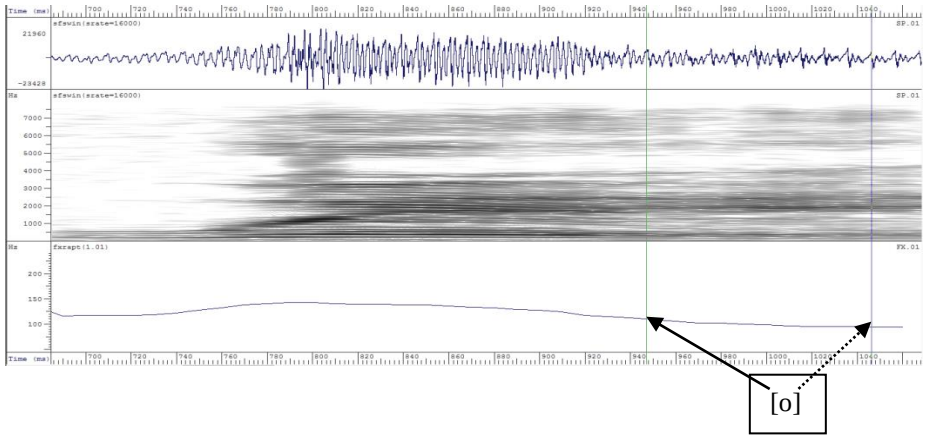

Figure 10. Educated Ibibio Speakers' Pronunciation of "Show"

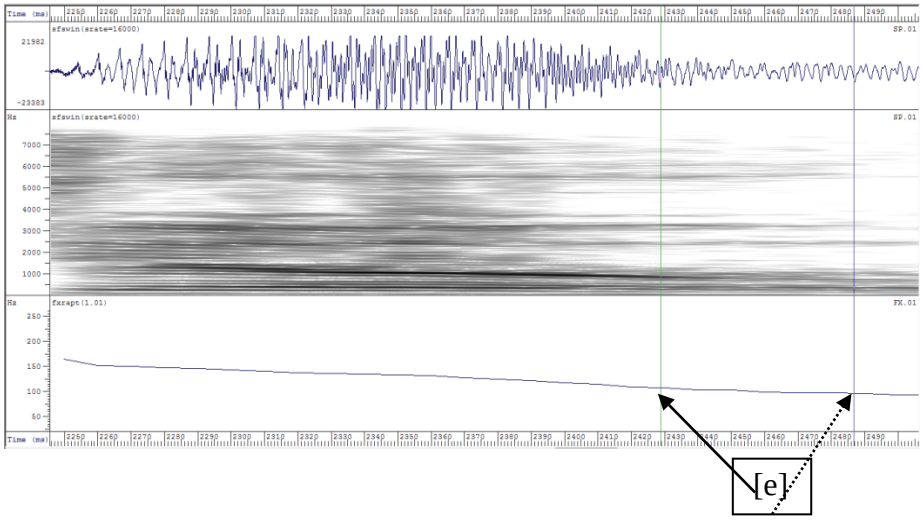

Figure 11. Educated Ibibio English Speakers' Pronunciation of "Way"

The spectograph above indicates the Fo measurement of the respondents' performance on [ee] is 125Hz for the rise and 120Hz for the fall while the durational measurement from the point of rise (as indicated by the segmented line) to the fall is 0.0057ms.

7. Summary of Measurement Values for Pitch and Duration, Controls Performance on /əʊ/ and /ei/

A comparative analysis of the duration measurement of the control and the EIE respondents, the duration difference between SBE /əʊ/ (146ms) and the EIE respondents on [e] (189ms) is 0.043ms, SBE [ei] (0.146ms) and EIE (0.256ms) is 0.11ms. The control's and the respondents' performance measurement values for pitch and duration on the diphthongs are presented on Tables 7 and 8 below.

Table 7. Summary of Measurement Value for Pitch Duration in Control's Performance on /əʊ/ and /ei/

Fundamental frequency (FO) Measurement			**Duration Measurement in Millisecond (ms)**
Diphthongs	Fo peak (H*)	Fo fall (L%)	From starting point to the direction of movement
/əʊ/	140Hz	70Hz	0.146ms
/ei/	110Hz	75Hz	0.146ms

Table 8. Summary of Measurement Values for Pitch and Duration in EIE Respondents' Performance on /əʊ/ and /ei/

Fundamental frequency (Fo) Measurement			**Duration Measurement in Millisecond (ms)**
Diphthongs	Fo Peak (H*)	Fo fall (L%)	From starting point to the direction of movement
228822/əʊ/	100Hz	95Hz	0.0099ms
/ei/	125Hz	120Hz	0.0059ms

From the acoustic analysis, it is observed that despite the differences in the duration measurements in both Englishes, a careful look at Columns 4, Table 5 and Column 4, Table 6, the Fo curve, as shown by Fo measurements and the pitch track (Figures 9-12), still point to the fact that the lengthening can be traceable to the need to preserve the peak and fall of the SBE diphthongs. Nevertheless, the shorter duration observed by the EIE respondents is an indication that the two SBE diphthongs were monophthongised by EIE. Though the quantity of the diphthongs were reduced, it is evident in the results of acoustic measurement that the Fo curves in both languages are still preserved.

From the above analysis, there is a clear indication that the rise-fall (H* L%) Fo on the long monophthong [ee] and [oo] show the "lengthening effect" needed to preserve the weight of the effaced segment.

8. Conclusion

In this study, efforts have been made to show the problems the Ibibio users of English as a second language have with the English diphthongs. Using a statistical moraic and acoustic approach as a phonological tool for our investigation, we have discovered that Ibibio speakers of English characteristically monophthongise diphthongs and that the lengthening process inevitably occurs. We have also been able to establish the fact that the lengthening is for the weight conservation and also to observe both the peak H* and the final L% which occurs in the SBE. These factors work hand in hand to lengthen vowels in final open stressed syllable.

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