The Prosody of Nigerian English

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Abstract

Nigerian English is a variety of English which has often been suggested to differ significantly from other varieties of English, especially in the area of prosody. This paper analyses the prosody of Nigerian English and compares it to the prosody of British English and three West African tone languages[i]. Read and semi-spontaneous speech was analysed acoustically. Significant differences were found in speech rhythm, where Nigerian English groups between the West African languages Anyi, Ega and Ibibio and British English. Furthermore, Nigerian English syllable structure is different from that of British English, and the tonal structure of Nigerian English is more similar to that of a tone language than an intonation language.

1. Prosody and Language Typology

Typological studies of languages have paid more attention to syntax and morphology than phonology, but research on the typology of the prosodic systems of the languages of the world is increasing [9],[10],[5],[13]. Cross-linguistic comparison in prosody is often done on the basis of speech rhythm, tonal structure and syllable structure. In the area of speech rhythm, languages have traditionally been divided into stress-timed and syllable-timed [16],[1]. Speech rhythm was understood to be a periodic recurrence of events. In syllable-timed languages such as French and Yoruba syllables were assumed to be equal in length. Stress-timed languages such as English or Polish, in contrast, were postulated to have regular recurring stress beats. No acoustic basis for either isochrony of stresses in stress-timed languages or equal length of syllables in syllable-timed languages was ever found [19],[3].

Recent measurements of the acoustic correlates of speech rhythm are based on durational cues. Ramus, Nespor & Mehler [18] segment speech into vocalic and consonantal parts and calculate the proportion of the vocalic intervals of a sentence and the standard deviation of the consonantal intervals. Grabe & Low [7] measure the difference in duration between successive vowel durations and between successive consonantal intervals. Gibbon & Gut [6] calculate the ratio of adjacent syllable and vowel durations. These approaches have succeeded in describing rhythmic differences between languages [18],[7],[6] as well as between varieties of one language [14],[8].

It has been suggested that rhythmic differences between languages are correlated with other phonological properties of languages such as their syllable structure and phonological vowel length distinctions [3]. Whereas languages classified as stress-timed tend to have a variety of different syllable structures and phonological vowel length distinction, languages classified as syllable-timed usually have a majority of CV syllables and no vowel length contrast.

In the area of tone, languages have been classified as tone languages, intonation languages and pitch accent languages [17]. In intonation languages, pitch carries semantic information but cannot be directly associated with lexical meaning. Conversely, the tones are used either on single words or groups of words of varying length and keep their relatively consistent meaning. Pitch accent languages use pitch for the differentiation of the meaning of various lexical items, but only limited to certain types of syllables or specific places in a word [17]. In tone languages, pitch is lexically significant, contrastive and relative. It is associated with tone-bearing units such as the syllable or the morpheme. Tone is thus a feature of the lexicon. Some tone languages have tone that is sensitive to word structure and affixation and there seems to be a sliding scale to languages where tones have no lexically contrastive function anymore but use "tonal accents" instead [21].

2. The Prosody of Nigerian English and other West African languages

2.1. Nigerian English prosody

In Nigeria, an estimated 400 different local languages are spoken, with English being the medium of education, business, commerce and mass media. Nigerian English itself has distinct varieties, usually dependent on the speakers' education and linguistic background [11],[22]. Standard Nigerian English is mainly spoken by University graduates and constitutes the socially most accepted variety. The prosody of Standard Nigerian English has been suggested to be syllable-timed rather than stress-timed [2],[22] although only very limited acoustic evidence is available [4],[22].

Nigerian English intonation differs systematically from British English intonation [12], and it has been suggested that it reflects the prosodic structure of the speaker's native language in a way that stressed syllables are associated with a high tone and unstressed syllables with a low tone [23]. In fact, proposals have been made to treat Nigerian English as a tone language with tone on every syllable [8].

The first aim of this study is to find acoustic evidence for a classification of Nigerian English speech rhythm. It will be compared both with British English and three West African tone languages. Second, Nigerian English syllable structure will be compared with that of British English. Finally, the tonal structure of Nigerian English will be analysed.

2.2. Prosodic description of Anyi, Ega and Ibibio

Anyi is spoken in the Eastern part of Ivory Coast and in Ghana and belongs to the Kwa languages. The following syllable structures occur in Anyi: V, CV, N, CVV, and CCV. Anyi has four phonological tones: Two level tones, H and L, and two contour tones, rising LH and falling HL. The

appearance of a mid tone is due to the effect of tone sandhi rules.

Ega is an isolate within a Kru speaking area of South Central Ivory Coast, with around 1000 full speakers. Although the language has been classified as Kwa, Ega has phonological features, such as the full implosive series, and morphological features, such as a complex nominal classification system, which distinguish it from the geographically nearest Kwa languages. Permissible syllable structures are V, CV, and CCV. The tone system of Ega has a three-way contrast: high (H), mid (M) and low (L).

Ibibio has been classified as a Lower Cross language ((New) Benue-Congo) and is spoken in the south-eastern part of Nigeria. The Ibibio syllable structure is (V/N), CV, CVV, CVC, CVVC, and CCV. The V/N is the syllabic prefix, which may be either a vowel or a syllabic nasal consonant, usually homorganic to the following consonant. The tone system has two level pitches, High and Low, plus a contrastive downstepped High tone in addition to two contour tones, High-Low and Low-High. The contour tones are combinations of the level pitches.

3. Method

3.1. Participants

Five speakers of Nigerian English, four female and one male, were recorded. The participants were chosen as speakers of Nigerian English Standard on the grounds of their education and linguistic history. All were born and educated in Nigeria and hold university degrees. Speaker NE1 speaks Ibibio, Efik, some Igbo and some Yoruba. Speaker NE2's mother tongue is Igbo; speaker NE3 is of Efik parentage. Speaker NE4 speaks Edo (mother tongue) and Yoruba, and speaker NE5 speaks Yoruba. Of the British English participants two are male and one female. They all speak an approximation of Southern Standard British English and all hold a University degree. Two speakers of Anyi, one male and one female, two male speakers of Ega and one female speaker of Ibibio constitute the West African participants.

3.2. Data

All Nigerian and British English participants read a story of 268 words for which they had as much time for preparation as they wanted. Subsequently, they were asked to retell the story in their own words. The Anyi speakers were recorded telling a story, of both of which the first 62 seconds were analysed.
The two Ega speakers were also telling a story, of which 73 seconds and 68 seconds respectively were analysed. The Ibibio speaker read 20 sentences of between 5 and 10 seconds length.

3.3. Analysis

The data were analysed using ESPS/waves+. All syllables were transcribed in SAMPA. For the calculation of speech rhythm, the length of each vocalic and consonantal interval was measured. Only the stable formant structure of vowels was included in the vocalic parts. Following [18], the percentage of vocalic intervals across all speech (%V) and the standard deviation of the length of the consonantal intervals (delta C) was calculated using the TASX environment [15]. The tones of Nigerian English syllables were transcribed by a

phonetician trained in ToBI [20] using a simplified system of high (H), mid (M) and low (L) as level tones and any combinations of these as contour tones. Tones were transcribed phonetically and no phonological status is proposed.

4. Results

4.1. Speech rhythm

Figure 1 illustrates that Nigerian English speech rhythm (N), measured in the acoustic variables %V and delta C, groups distinctly from the speech rhythm of Anyi (A), Ega (E) and Ibibio (I) and that of British English (B).
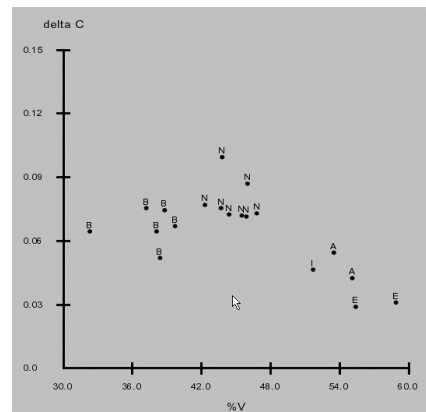

Figure 1: Speech rhythm of Nigerian English (N) compared to British English (B), Anyi (A), Ega (E)and Ibibio (I) speech rhythm.

4.2. Syllable structure

Table 1 lists the percentage of the most frequent syllable types occurring in the read speech of all speakers. Compared to the British speakers, all Nigerian speakers except for speaker NE2 produce a higher percentage of CV syllables in the read story. In general, individual differences between the syllabification of the story are evident among the Nigerian speakers. Whereas Nigerian speaker NE2 is very similar to the British English speakers, the other Nigerian speakers differ from them.

Table 1: Percentages of the most frequent syllable types produced by each British (BE) and Nigerian English (NE) speaker in the read speech.

Speaker	CV	CVC	VC	CVV	V	CVVC
BE1	28	19	11.7	7.9	5.7	5.3
BE2	24.5	18.5	11.1	7.3	6.6	4.5
BE3	23.5	22.1	11.2	4.6	3.8	2.4
NE1	36.5	20.7	12	5.5	8	3
NE2	28	20	15	6	5	4.5
NE3	37.5	16	10.6	6	8	5
NE4	40	19.5	10	4.7	8	3
NE5	36	17	12.5	5	8	4

Looking at the percentage of open and closed syllables in the speech of each speaker it can be seen that the British English speakers and Nigerian speaker NE2 produce fewer open syllables than closed syllables. For the other Nigerian speakers, the reverse is true (see Table 2).

Table 2: Percentages of open and closed syllables produced by each British and Nigerian English speaker in the read speech.

	Open syllables	Closed syllables	Number of syllables
BE1	44.7	55.2	315
BE2	38.4	61.6	286
BE3	31.8	68.1	295
NE1	53.3	46.4	309
NE2	42.1	57.8	330
NE3	53.9	46	330
NE4	55.5	44.4	317
NE5	52.9	47	319

4.3. Tone

Figure 2 shows the percentages of level tones and contour tones on all syllables in both the read speech and the semi-spontaneous speech for the Nigerian English speakers. Contour tones or pitch movements on a syllable are very rare in Nigerian English. Between 92% and 98.5% of all syllables have a level tone. No differences between read speech and semi-spontaneous speech were found. The distribution of contour tones is highly restricted. Pitch movements on syllables occur predominately in pre-pausal syllables. This is the case for 82% of all pitch movements produced by speaker NE5, for 91% produced by speaker NE1, for 96% produced by speaker NE3, 75% produced by speaker NE4 and 100% of all pitch movements produced by speaker NE2.
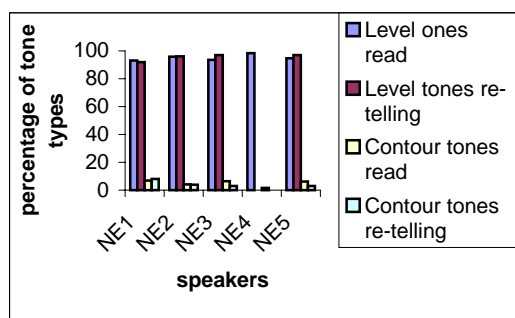

Figure 2: Percentages of level tones and contour tones in Nigerian English read and semi-spontaneous speech.

Pitch height of syllables in Nigerian English seems grammatically determined. The speakers showed a tendency to associate different syntactic categories with particular tones. Articles, prepositions and conjunctions, for example, are always produced with a low or a mid tone. Verbs, adjectives and nouns, on the other hand, tend to be produced with a H. Tables 3 and 4 illustrate this on two phrases.

Table 3: Pitch produced by the Nigerian English speaker in the phrase "a tiger and a mouse".

	a	ti	ger	and	a	mouse
NE1	L	H	L	L	L	H
NE2	L	H	H	M	M	M
NE3	L	H	H	M	L	LH
NE4	L	H	H	L	L	H
NE5	L	M	H	L	L	H

However, not only the "stressed" syllable, the one that would be accented in British English, is associated with a H but all syllables of a multisyllabic word.

Table 4. Tones produced in three sentences by all Nigerian English speakers.

	were	wal	king	in	a	field
NE1	L	M	H	L	L	HL
NE2	L	H	H	L	L	H
NE3	L	H	H	L	L	HL
NE4	L	H	H	L	L	H
NE5	L	H	H	L	L	HL

Table 5 presents the tonal structure of all multisyllabic words that did not occur phrase-initially or phrase-finally in the read story produced by all Nigerian English speakers.

Table 5: Tonal patterns produced on multisyllabic words by the Nigerian English speakers.

nothing	continued	remove	enough	opened	began
HH	LHH	LH	LH	MM	LH
HH	LHH		HM	MM	LH
HH	MHM	LH	MM	HH	ML
HH	LHH	MM	LH	MM	LM
HH	LHH	LH	LH	MM	LM

Despite inter-speaker differences, it can be seen that the syllables of a multisyllabic word are usually produced with equally (high) tone. "Tiger", for example, has two high tones in the majority of the recorded productions. The same holds true for "walking", "lying", "nothing", "opened", "something" and "swallow". These are all examples of multisyllabic words with primary word stress on the first syllable. Words with primary stress on the second or even later syllable demonstrate another tonal pattern: the first "unstressed" syllable usually carries a low tone, the "stressed" syllable carries a high tone, which is then continued throughout the rest of the word. Examples for this are the words "whatever", "continued", "remove", "enough" and "began". The data thus suggest a right-spreading rule for H on multisyllabic words, beginning with the first stressed syllable.

Table 6: Tonal patterns produced on multisyllabic words by the Nigerian English speakers.

tiger	walking	lying	something	swallow	whatever
HH	HH	HH	MM	MM	HMM
HH	MH	HM	HH	MM	LHH
HM	HH	HH	HL	ML	MHM
HH	HH	LL	LL	MH	LHM
HH	MM		ML	ML	LHH

5. Discussion

The results show distinct prosodic differences between the varieties of English spoken in Southern Britain and in Nigeria. In terms of speech rhythm Nigerian English is different from both the speech rhythm of the West African tone languages and that of British English. Especially the percentage of vowel intervals is greater in Nigerian English than in British English.

Equally, syllabification is different in Nigerian English compared to British English. In the former, a higher percentage of CV syllables occurs and the ratio of open and closed syllables is different from that in British English. However, interindividual differences between the Nigerian English speakers become apparent.

In terms of tone, contour tones on syllables are very rare in Nigerian English and only occur in very restricted environments, mainly on pre-pausal syllables. A tendency to produce stressed syllables with a high tone and unstressed ones with a low tone, as proposed in [23], was not found. Rather, words of particular grammatical categories seem to be associated with specific tones. Articles, prepositions and conjunctions tend to have a low tone, whereas nouns, verbs and adjectives are usually produced with a high tone. A special right-spreading tone rule was found for multisyllabic verbs and nouns, where "unstressed" syllables are associated with a low tone and the "stressed" syllable and all other following ones have a high tone. Nigerian English prosody is thus close to those tone languages that have tones associated with a grammatical rather than lexically contrastive function than to the use of tone in intonation languages.

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