

The Monophthongs of Formal Nigerian English: An Acoustic Analysis

Nisad Jamakovic¹, Robert Fuchs²

¹ Englisches Seminar, Westfälische Wilhelms-Universität Münster, Germany ² Institut für Anglistik und Amerikanistik, Universität Hamburg, Germany

n jama01@uni-muenster.de, robert.fuchs@uni-hamburg.de

Abstract

Postcolonial varieties of English, used in countries such as Nigeria, the Philippines and India, are influenced by local ("endonormative") and external ("exonormative") forces, the latter often in the form of British/American English. In the ensuing stylistic continuum, informal speech is more endonormatively oriented than formal/educated speech – which is, in turn, clearly distinguishable from British/American English. The formal subvariety is often regarded as the incipient local standard and is commonly less marked by L1 influence than the informal subvariety.

Nigerian English (NigE) is the most widely spoken African variety of English, but empirical/quantitative descriptions are rare. In this pilot study, we present an acoustic analysis of eleven phonological monophthongs and two phonological diphthongs that are commonly monophthongised. A total of 811 occurrences, produced in formal contexts by nine educated speakers of NigE with L1 Igbo, was extracted from the ICE Nigeria corpus and analysed acoustically (Lobanov-normalised vowel formants at vowel midpoint).

Results show that the NigE speakers reduced the thirteen vowel system to a total of nine distinct phonemes that closely resembles the L1 Igbo vowel inventory. This result suggests substantial L1 influence even at the level of Formal NigE.

Index Terms: Nigerian English, monophthongs, monophthongisation, Igbo, postcolonial varieties of English, New Englishes

1. Introduction

1.1. History and status of Nigerian English

Nigerian English (NigE) is a postcolonial variety of English (also known as New Englishes or World Englishes) and several studies have revealed that it differs from other varieties, such as British English, in terms of its syntax, lexis, pragmatics and phonology [1-7]. Nevertheless, our current, evidence-based knowledge of the structure of NigE is still fairly limited, especially concerning its phonology. The lack of reliable studies in this area is all the more surprising given that Nigeria is the most populous African country [8].

English performs a wide range of functions and is highly institutionalized in Nigeria. With an estimated 510 indigenous languages spoken in Nigeria [1, 9], English serves as a lingua franca of the educated elite in their social interaction and occurs widely in formal contexts such as government, law, education, business, media, and commerce. English is often called the official language of Nigeria, although it has no legal status [7].

The three major indigenous languages in Nigeria are Yoruba, Igbo, and Hausa [10].

While there is no official data on the number of speakers [11], an estimate of 20% of the population is often mentioned [11, 7], but there are also reports of up to 54% of Nigerians speaking English to at least intermediate level [12]. The number of speakers of English is growing dynamically and steadily [7, 12] and reports of children growing up in urban areas starting to acquire English as their L1 [13, 14] indicate the increasing entrenchment of the language.

1.2. Exonormative or endonormative standard model, or somewhere in between?

Although English first reached the Nigerian coast in the 16th century through British trading ventures, the transmission of English through schooling in Nigeria did not commence until the mid-19th century [13]. While early contact between the indigenous languages and English is thought to have given rise to Nigerian Pidgin English [15], formal education from the mid-19th century onwards gave rise to NigE, which was originally exclusively oriented towards British English (BrE) as the norm-providing variety.

local ("endonormative") Today, and ("exonormative") forces compete, in a process common for postcolonial varieties of English [16]. Exonormative forces surface mainly in the form of Received Pronunciation (RP), which is officially promoted and accepted by schools, teachers, and textbooks as a model and norm-providing accent [17]. However, endonormative forces, promoting a new, locally emerging standard, compete with exonormative forces. In tandem, these forces give NigE a distinct character that sets it apart from BrE, due to (1) influence of indigenous languages, (2) the influence of non-standard dialects of BrE in early stages of the development of NigE, (3) the way NigE is acquired (mainly in formal settings) and (4) the sociolinguistic roles NigE fulfils [2].

English in Nigeria, just as in England and the United States, is diverse, and NigE is sometimes described as a cluster of varieties [18-19]. The (sub)varieties of NigE can be classified based on L1 background, ethnicity, region, education and other variables. In this study, we focus on the spoken subvariety of Educated Southern NigE as used by L1 speakers of Igbo. Educated NigE, the variety used by university degree holders, is set to be the de facto norm in the local process of standardization that NigE, like other postcolonial varieties, is undergoing [20]. The adoption of an endonormative standard is a matter of ongoing debate among Nigerian linguists and educators, with regular demands for its acceptance [14, 21].

2. Previous research

Over the last decades, a sizable number of studies on the linguistic features of the educated variety of NigE have been published [20]. Among them, the phonology of NigE has generated a fair amount of scholarly attention [7, 18, 21-24]. However, the evidence is so far is mostly descriptive and impressionistic, prompting calls for empirical, quantitative studies [7]. Among the few exceptions are studies on prosody, fluency and diphthongs [25-27], but an acoustic study on its monophthongs is lacking. Further, a review of published studies on NigE phonology [21] suggested disagreement as to the number of monophthongs in NigE, with estimates ranging from 5 to 12. However, most studies agree that the monophthong system of NigE is reduced in comparison to the 11-monophthong system of Standard Southern British English (SSBE).

As discussed in section 1.2, NigE has historically been influenced by indigenous languages, in addition to possible current influence from the L1s of individual speakers. Igbo, the L1 of the speakers in present study, has eight vowels. These are subject to vowel harmony rules based on the feature advanced tongue root [ATR]. The eight phonological Igbo vowels /i, e, o, u, i, a, o, u/ are realized as [i, ε , o, u, i, α , o, v], respectively; the first four vowels are realized with advanced tongue root [+ATR] and the other four with retracted tongue root [-ATR], indicated, according to convention, by a diacritic [28].

Two characteristics thought to be specific to Southern Nigerian English are the absence of phonemic vowel length and the lack of centralized vowels [7]. The realization of the NURSE vowel is determined by orthographic, geographic, ethnic and lexical factors [18, 23]. Words with *ear*, *er* spelling are usually realized as [a] and occasionally with $[\epsilon]$ or $[\epsilon]$; words with *ir*, *yr* spelling are realized with $[\epsilon]$ or $[\epsilon]$; and words with *or*, *our*, *ur* spelling are realized as [3]. Moreover there is a tendency towards monophthongization in NigE [1], which is why we include the two phonological diphthongs FACE and GOAT in our analysis.

Table 1 summarizes vowel realizations in Educated Southern NigE, using the lexical sets notation [29]. Vowels with the same realizational variants are grouped under the same number. Table 1 is based on several previous studies, most of which are in broad agreement on the number of monophthongs in NigE and their realization. The great majority of studies contain claims based on impressionistic evidence, and require instrumental verification in order to provide a more precise picture of NigE phonology.

3. Aims

This study aims to determine the number of monophthongs of Educated Southern NigE as well as their realization. As a default hypothesis, we will seek to confirm the patterns documented in previous, impressionistic studies:

H1: The number of monophthongs and realization variants in Educated Southern NigE follow the pattern in Table 1.

BrE is the norm-providing variety in Nigeria, but NigE is a distinct variety. As pointed out in Section 2, NigE has been suggested to have a reduced vowel system in comparison with SSBE/RP. However, we currently lack knowledge concerning the extent to which NigE differs from RP in terms of vowel quality. This is regarded as the most evident difference in quality between the stressed monophthongs of young RP and old RP [31].

Thus, we assume that:

H2: NigE is more similar to old RP than young RP (or SSBE) in terms of the monophthong quality.

4. Methodology

4.1. Data

The data for this analysis was extracted from the spoken part of the Nigerian component of the International Corpus of English (ICE Nigeria) [32]. Naturalistic audio recordings from formal contexts (unscripted speeches, phone calls, broadcast talks, broadcast discussions, broadcast interviews, and class lessons) of nine university-educated speakers with L1 Igbo (aged 31-53, three unknown) were analyzed. Due to the scarcity of female speakers in the formal sections of the corpus, which reflects male dominance in formal contexts in Nigeria more generally, only male speakers were selected.

4.2. Analysis

Where possible, recordings were subjected to forced phonemic alignment [33] and annotated manually otherwise. We additionally inspected all files visually in Praat [34] and corrected the boundaries manually. Only stressed syllables were analyzed, yielding a total of 811 instances of the 11 phonological monophthongs /i:, I, ε , α , α ; ν , ν ; ν , ν ; ν , ν ; λ / and the two phonological diphthongs /ei, əu/. The number of instances varies, from 116 tokens for /p/ (= 90 LOT and 26 CLOTH) and 41 for /ɛ/ (DRESS). The first two formants (F1 and F2) of the phonological monophthongs were measured at vowel midpoint and at 20% and 80% of vowel duration for phonological diphthongs, using a Praat script written for this purpose. Subsequently, measurements were normalized with NORM [35] using the Lobanov method, due to its superior performance in excluding individual physiological variation, while retaining sociolinguistic variation [36].

5. Results

5.1. The Monophthongs of Educated NigE

The results overall confirm the expected pattern of the monophthongs of Educated Southern NigE, as documented in previous descriptive studies [7, 18, 30]. The analysis indicates that Southern NigE as used by educated L1 Igbo speakers has a seven-monophthong system, in which the vowels are arranged in a V-shaped formation with a centralized vowel /a/ (see Fig. 1). This pattern is typical of languages with five- and seven-vowel systems [37]. These vowels are (anti-clockwise from top left) FLEECE-KIT, FACE, DRESS, TRAP-START-BATH-PALM, CLOTH-LOT-THOUGHT-NORTH-FORCE-STRUT, GOAT and GOOSE-FOOT. The realization of the NURSE vowel depends on orthography, as discussed in section 5.3 below, and it is not a separate monophthong.

Disregarding FACE and GOAT, which are diphthongs in RP, the eleven-monophthong system of RP has thus been reduced to five monophthongs in Educated Southern NigE, due to the following mergers (again anti-clockwise from top left): KIT-FLEECE, TRAP-START-BATH-PALM, CLOTH-LOT-THOUGHT-NORTH-FORCE-STRUT and FOOT-GOOSE. Only DRESS did not undergo a merger. The first and last of the mergers is due to the absence of a phonemic lax-tense distinction.

Subsequent to this general discussion of the monophthong system, we now focus on degrees of variation in particular

Table 1: The monophthongs of Educated Southern NigE according to previous research.

	Lexical Set	NigE	SSBE	Ref.
(1.)	KIT	i	I	[7, 18, 30]
	FLEECE	i	i:	**
(2.)	DRESS	ε, e	ε	**
(3.)	TRAP	a	æ	66
	BATH	a	a:	66
	PALM	a	a:	66
	START	a	a:	66
(4.)	LOT	э	b	66
	CLOTH	э	v	66
	STRUT	э	Λ	66
	THOUGHT	э	ɔ :	66
	NORTH	э	ɔ :	66
	FORCE	э	ɔ :	66
(5.)	NURSE	ε, ο, a	3:	66
(6.)	FOOT	u	υ	66
	GOOSE	u	u:	66
(7.)	FACE	e, a, eː, ei	eı	[7, 18, 30, 24]
(8.)	GOAT	0, 0, 0:,	ĐÜ	"
		ນu, ຈັບ		

phonemes. We first discuss phonemes with relatively consistent realization, followed by those involving a larger degree of variation.

5.2. Vowels with uniform realizations

Speakers were relatively consistent in realizing

- FLEECE and KIT as [i]
- TRAP, BATH, START, and PALM as open and centralized [a]
- LOT, CLOTH, THOUGHT, NORTH, FORCE, and STRUT as midopen [2]
- FOOT and GOOSE as [u].

5.3. Vowels with multiple realizations

Greater degrees of variation were revealed for:

- FACE: mainly realized as monophthongs [e] (ca. 51% of tokens), [ε] (ca. 11%) and [i] (8%), less frequently as diphthongs [ei] and [εi] (16% and 14%, respectively).
- DRESS: chiefly realized as [ε] (two-thirds of all instances), otherwise as [e].
- NURSE: realized as [ε], [e], [a], and [o], depending largely on spelling (40%, 5%, 31%, and 16%, respectively); While speakers generally followed the spelling rules, [e], [ε], [a], and [o] were not strictly speaking in complementary distribution, which might indicate that this pattern has not stabilized fully yet. Finally, a minority of RP-like [3] realizations also occurred (8%).
- GOAT: mainly realized as [0] (50%) and [0] (16%). [ou], [ou] and [00] are the most prevalent diphthongal realizations (11%, 7% and 7%, respectively), with relatively short glides. Less frequent diphthongal realizations were [00] (4.5%), [a0] and [ε0] (4.5%).

5.4. Educated Southern NigE compared to SSBE/RP

In order to determine whether the NigE monophthong system is more similar to older or more recent versions of RP (or SSBE), we compare our results to the age-stratified data from [31], illustrated in Figures 2 and 3. (NB: The BATH, LOT, and

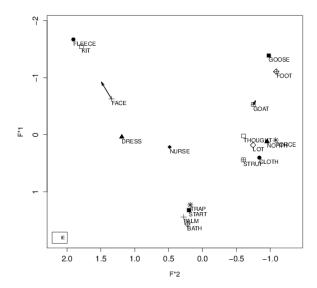


Figure 1: The monophthongs of Educated Southern NigE

THOUGHT lexical sets of BrE are marked with asterisks as they can also stand for the (1) PALM and START and (2) the CLOTH; FORCE and NORTH lexical sets, respectively).

Overall, NigE monophthongs are more similar to old than young RP, confirming our hypothesis. For example, while the DRESS vowel is almost identical in quality in NigE and old RP, the DRESS vowel of young RP is considerably lower than in NigE. The most glaring difference involves the GOOSE vowel, which is quite similar in quality in NigE and old RP. However, recent change has caused the fronting of the GOOSE vowel in RP, so that in young RP it is considerably more fronted than its NigE counterpart. Other differences involve /æ/, /ɑː/, and /ʌ/, which in old RP are positioned in the general vicinity of NigE /a/, and have shifted in counterclockwise direction in young RP. Finally, the TRAP vowel is more central in young RP compared to old RP, and has moved away from its NigE equivalent to a certain extent.

6. Discussion

This pilot study investigated the realization of 11 phonological monophthongs and two phonological diphthongs in Educated NigE, as produced by L1 Igbo speakers. The results reveal that this subvariety has seven monophthongs in total, i.e. /i, e, ϵ , a, \circ , o, u/; they also reveal that speakers of Educated NigE tend to monophthongize the diphthong /eɪ/ to [e] (less frequently [ϵ]) and the diphthong /eo/ to [o] (less frequently [ϵ]). These findings are mainly in line with earlier descriptive and impressionistic studies [7, 18, 30], confirming our hypothesis.

An explanation of these results is likely to be found in a combination of factors, including

- 1. the input Nigerians received while learning English during the so-called foundation period of NigE [14],
- the context within which English was and continues to be learned in Nigeria, i.e. mostly in educational institutions with an emphasis on writing,
- 3. the influence of Nigerian languages during that time, i.e. historical L1 transfer.
- the current norm orientation of NigE, which is a combination of an exo- and endonormative orientation,

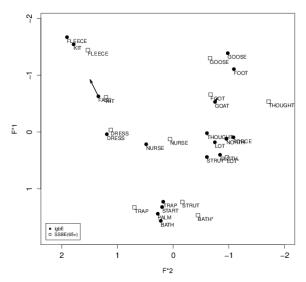


Figure 2: NigE vs. old RP

the influence of the L1 of the speakers investigated here (Igbo), i.e. contemporary L1 transfer.

From the results it appears that a strong case for (5), i.e. contemporary influence from the L1 Igbo on the speakers' vowel system, can be excluded. While we did not systematically investigate contexts where vowel harmony would apply, results such as the uniform realization of FLEECE-KIT and TRAP-START-BATH-PALM are not compatible with a wholesale adoption of the Igbo vowel system with vowel harmony.

However, historical transfer from Nigerian L1s, i.e. factor (3), is a plausible explanation in terms of the reduction of the English monophthong system to six vowels (not counting FACE and GOAT). The acquisition of English in schools, with a focus on writing, i.e. factor (2), is also likely to be of importance. This factor may account for the merger of vowels not consistently differentiated by spelling (FLEECE-KIT, TRAP-START-BATH-PALM, FOOT-GOOSE) as well as the split of NURSE, and subsequent assignment to other vowels, based on spelling.

The norm orientation of NigE, factor 4, is complex. The comparison of the results with data from RP suggests that, if a current exonormative orientation is of influence at all, then it is towards a more conservative rather than a contemporary form of RP. However, a current exonormative orientation, even to older RP, is not necessary to account for the results. The influence of an exonormative orientation could have been purely historical and may have ceased to be of influence, or at least diminished. The consistent adoption of a number of vowel mergers supports the conclusion that an endonormative orientation is at work and that official policy, still exonormatively oriented, has not caught up with this development. At the current stage of evolution of NigE, such an ambiguity between de jure and de facto norms is not unusual for a postcolonial variety [14].

Finally, some of the results may also be partly accounted for by factor (1), i.e. the diverse native English input during the foundation period of NigE. This input included regional varieties of English from across the British Isles, notably Scottish and Irish English [38], which might

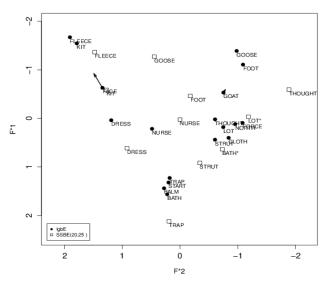


Figure 3: NigE vs. young RP

account for the monophthongization of FACE and GOAT which these varieties included, and possibly the FLEECE-KIT and FOOT-GOOSE mergers.

7. Conclusion

In conclusion, the results of this acoustic analysis show that Educated NigE has a seven-monophthong system. These findings agree with previous impressionistic research. Furthermore, our study unveiled that NigE is more similar to old RP than it is to young RP. The NigE vowel system has not adopted the recent changes that have taken place in RP. A complex set of factors, including historical L1 transfer, diverse input during the early development of NigE, an increasingly endonormative orientation as well as the acquisition of NigE in formal settings is likely to account for the characteristics of the monophthong system documented here.

In future work, we will focus on other NigE subvarieties in order to obtain a comprehensive picture of the monophthongs of NigE, specifically speakers with L1 Yoruba. Preliminary results indicate that (1) they have a similar monophthong system and (2) that they tend to apply similar phonological strategies, with some realizational differences. These results appear to lend further support to the conclusion that contemporary L1 influence is, at best, of very limited importance. Instead, historical influence from diverse L1s may have contributed to a relatively unified norm (at the acrolectal level studied here), which is currently propagated by an increasingly endonormative orientation.

8. References

- U. Gut, "Standards of English in West Africa," in *Standards of English*, R. Hickey, Ed. Cambridge: Cambridge University Press, 2012, pp. 213-228.
- [2] M. A. Alo and R. Mesthrie, "Nigerian English: morphology and syntax," in A Handbook of Varieties of English: A Multimedia Reference Tool, E. W. Schneider, K. Burridge, B. Kortmann, R. Mesthrie, and C. Upton, Eds. Berlin: Mouton de Gruyter, 2004, pp. 323-339.

- [3] D. Jowitt, "Nigerian English lexis: a sentimental investigation," Kakaki: A Journal of English Studies, vol. 1, no. 4, 2000.
- [4] R. Blench, *A dictionary of Nigerian English*. [Online]. Available: www.rogerblench.info/Language/English
- [5] O. Okoro. Exploring Nigerian English: A Guide to Usage. Saarbrücken: VDM, 2011.
- [6] A. Bamgbose, "The English language in Nigeria," in *The English language in West Africa*, J. Spencer, Ed. London: Longmans, 1971, pp. 35-48.
- [7] U. Gut, "Nigerian English: phonology," in A Handbook of Varieties of English: A Multimedia Reference Tool, E. W. Schneider, K. Burridge, B. Kortmann, R. Mesthrie, and C. Upton, Eds. Berlin: Mouton de Gruyter, 2004, pp. 35-54.
- [8] Central Intelligence Agency, The World Factbook. 2017. [Online]. Available: https://www.cia.gov/library/publications/the-world-factbook/index.html
- [9] P. M Lewis, G. F. Simons and C. D.Fennig, (). Ethnologue: Languages of the world. 2016. [Online]. Available: https://www.ethnologue.com/country/ng.
- [10] H. Igboanusi, A Dictionary of Nigerian English Usage. Ibadan: Enicrownfit Publishers, 2002.
- [11] D. Jowitt, "English in Nigeria today: some trends discerned," Journal of the Nigeria English Studies Association (JNESA), vol.16 no. 1, pp. 1-12, 2013.
- [12] Euromonitor International, The Benefits of the English Language for Individuals and Societies: Quantitative Indicators from Cameroon, Nigeria, Rwanda, Bangladesh and Pakistan, 2010.
- [13] U. Gut and R. Fuchs, "Progressive Aspect in Nigerian English," *Journal of English Linguistics*, vol. 41 no. 3, pp. 243-267, 2013.
- [14] E. W. Schneider, Postcolonial English. Varieties Around the World. Cambridge: Cambridge University Press, 2007.
- [15] A. Banjo, "On codifying Nigerian English: Research so far," In New Englishes: A West African Perspective, A. Bamgbose, A. Banjo and A. Thomas, Eds. Asamara: Africa World Press, 1997, pp. 203-231.
- [16] B. B. Kachru, "Standards, codification and sociolinguistic realism: the English language in the outer circle," in *English in the World Teaching and Learning the Language and Literatures*, R. Quirk and H.G. Widdowson, Eds. Cambridge: Cambridge University Press, 1985, pp. 11-30.
- [17] V. O. Awonusi, "The Americanization of Nigerian English," Word Englishes, vol. 13 no. 1, pp. 75-82, 1994.
- [18] A. S. Bobda, "Some segmental rules of Nigerian English phonology," *English World-Wide*, vol. 28, no. 3, pp. 279-310, 2007.
- [19] D. Jowitt, "Nigeria's national language question: Choices and constraints," In New Englishes: A West African Perspective, A. Bamgbose, A. Banjo and A. Thomas, Eds. Asamara: Africa World Press, 1997, pp. 34-56.
- [20] U. Gut, "Towards a codification of Nigerian English The ICE Nigeria Project," *Journal of the Nigeria English Studies Association (JNESA)*, vol. 15, no. 1, pp. 1-32, 2012.
- [21] U. E. Josiah and S. T. Babatunde, "Standard Nigerian English phonemes: the crisis of modelling and harmonization," World Englishes, vol. 30, no. 4, pp. 533-550, 2011.
- [22] A. S. Bobda, "Comparing some phonological features across African accents of English," *English Studies*, vol. 81, no. 3, pp. 249-266, 2000.
- [23] A. S. Bobda, "The phonologies of Nigerian English and Cameroon English," In New Englishes: A West African Perspective, A. Bamgbose, A. Banjo and A. Thomas, Eds. Asamara: Africa World Press, 1997, pp. 248-268.
- [24] D. Eka, A Phonological Study of Standard Nigerian English. [Unpublished PhD]. Ahmadu Bello University, Zaria, 1985.
- [25] U. Gut, "Nigerian English prosody," English World-Wide, vol. 26, no. 2, pp. 153-177, 2005.U. Cunningham, "Using Nigerian English in an international academic setting," Research in Language, vol. 10 no. 2, pp. 143-158, 2012.
- Language, vol. 10 no. 2, pp. 143- 158, 2012.

 [26] U. Gut and R. Fuchs, "Exploring speaker fluency with phonologically annotated ICE corpora," World Englishes, vol. 36, no. 3, pp. 387-403, 2017.

- [27] Dyrenko, Natalia and Robert Fuchs. 2018. The Diphthongs of Formal Nigerian English: A Preliminary Acoustic Analysis. Proceedings of Interspeech 2018, 2563-2567.
- [28] R. Anyanwu, Aspects of Igbo Grammar: Phonetics, Phonology, Morphology and the Tonology of Nouns. Hamburg: Lit. 1998.
- [29] J. C. Wells, Accents of English. Cambridge: Cambridge University Press, 1982.
- [30] D. Jowitt, Nigerian English Usage. Lagos: Bencod Press, 1991.
- [31] S. Hawkins and J. Midgley, "Formant frequencies of RP monophthongs in four age groups of speakers," *Journal of the International Phonetic Association*, vol. 35 no. 2, pp. 183-199, 2005
- [32] U. Gut, ICE Nigeria: Nigerian component of the International Corpus of English. [Online]. Available: https://sourceforge.net/projects/ice-nigeria
- [33] T. Kisler, U. D. Reichel, and F. Schiel, "Multilingual processing of speech via web services," *Computer Speech & Language*, vol. 45, pp. 326-347, 2017.
- [34] P. Boersma and D. Weenink, Praat: Doing Phonetics by Computer (Computer Program). Version 6.0.20 [Online]. Available: http://www.praat.org
- [35] E. R. Thomas and T. Kendall, NORM The normalization and plotting suite. [Online]. Available: http://lingtools.uoregon.edu/norm/index.php
- [36] B. M. Lobanov, "Classification of Russian vowels spoken by different listeners," *Journal of the Acoustical Society of America*, vol. 49, pp. 606-08, 1971.
- [37] P. Ladefoged and I., Maddieson, "Vowels of the world's languages," *Journal of Phonetics*, vol. 18, pp. 93-122, 1990.
- [38] V. O. Awonusi, "Regional Accents and Internal Variability in Nigerian English: A Historical Analysis," *English Studies*, no. 6, pp. 555-560, 1986.