European Journal of English Language Studies

An Optimality Theory-Based Approach into the Phonotactic Constraints of English Spoken by Broadcasters in Nigeria

Abdulmalik Usman[*] [iD]
Bauchi State University, NIGERIA

Aisha Abubakar Kagu
College of Health Sciences and Technology, NIGERIA

Abstract: One of the observations in the English spoken particularly in Nigeria is phonotactic constraints. The constraints pin down the generalization which guide the articulation of sequences of phonemes. The paper examines the patterns of English consonant clusters articulation of Nigerian broadcasters in the onset and coda positions against Received Pronunciation English. The study is conducted within the framework of Optimality Theory (henceforth OT). 20 radio and television broadcasters from 4 electronic media were selected as participants. Data were obtained by means of production test and OT was employed for the analysis. The findings revealed that the participants used epenthetic vowels to break-up consonants clusters in the onset and consonant deletion to simplify clusters in the coda. The subjects' productions can be captured by ranking Markedness constraints higher than Faithfulness constraints.

Keywords: *Broadcasters, constraints, deletion, epenthesis, optimality theory phonotactic.*

Introduction

Phonotactic rules express what is or isn't possible regarding the distribution of segments. They are rules which govern the linear order of phonemes and their occurrences in language (Yavas, 2011). They state the acceptable and unacceptable sequences of phonemes in a particular language and the possible syllable structures, vowel sequences and consonant cluster. However, one of the challenges to most non-native speakers of English is the articulation of consonant cluster. This is because consonant clusters do not exist in most of the African languages and Nigeria in particular. The non-native speakers of English often employ some strategies to simplify or declusterize the consonant cluster. These strategies are: epenthesis and deletion (Soneye & Oladunjoye, 2015).

Epenthesis is a feature of non-native English around the world. Kachru and Smith (2008) report that non-native speakers of English in South East Asia usually insert vowel /ɪ/ in word initial position to break up the cluster in the onset. For instance, /skul/ is pronounced as [ɪskul]. Shibuya and Erikson (2010, as cited in Soneye and Oladunjoye, 2015) also assert that Japanese speakers of English encounter difficulties in articulating English consonant cluster and therefore insert epenthetic vowels. The English spoken in East Africa is also characterized by vowel insertion to break up clusters. For instance, the RP English word against /əgenst / is realized as [agenɪst], and the situation is similar to West African English where epenthetic vowels are usually introduced to break up consonants cluster where /smɔːl/ becomes [sumul] (Atechi, 2006). Deletion is another feature used by non-native speakers of English to simplify the consonant cluster. In Malaysian English, one of the consonants in the coda is usually deleted to simplify the coda. For instance, /desk/ is pronounced as [des]. Moreover, in Singaporean English /riːsənt/ is pronounced as [risen] while in Indian English /h æ n d/ is realized as [h a n]. Cluster reduction is also a major characteristic of English as it is spoken in Ghana and it is similar to the English spoken in West Africa. For example, the English word most /mɪst/ is realized as [mɪs]. The scenario is similar to the English spoken in Nigeria where first /fɜː st/ is produced as [fos] (Atechi, 2006; Huber, 2004).

[*] **Corresponding author:**
Abdulmalik Usman, Department of English and Literary Studies Bauchi State University, Gadau, Nigeria. ✉ ausmanb09@gmail.com

Literature Review

In Nigeria, there are researches on the phonological features of broadcasters. Soneye (2007) observes that the effect of spelling also influences the pronunciation patterns of newscasters of the Nigerian Television Authority. For instance, the English word gigantic /dʒaɪdʒæntɪk/ is produced as [ɡɪɡantɪk]. The study focused mainly on spelling pronunciation phenomena and the aspect of syllable structure was not covered by the research. Similarly, Akpan, et al. (2012) also identified the influence of mother tongue in the broadcasting industry in Nigeria. The findings revealed that Nigerian broadcasters are influenced by transfer from their mother tongue in their broadcasting and suggests for intensive linguistic training in order to improve their proficiency. The study gives insight into the problems of broadcasters in southern Nigeria who use Igbo English.

In a related study, Emeka-Nwobia and Onu (2013) examined the phonological errors of broadcasters in Ebonyi State, neighbouring Enugu State, Nigeria. In this paper, newscasts were tape recorded and analysed using Phonemic Theory. The study found that the errors being committed by the newscasters were associated with substitutions of English phonemes with the phonemes of the Igbo language. Furthermore, Aladeyomi (2013) analyzed the pronunciation patterns of Nigerian television newscasters against the standard British pronunciation. He focused on errors related to central vowels, consonants, stress and intonation. The respondents transfer the features of their native language to English. The study used phonetic transcription of news telecasts that were tape recorded and the findings revealed some errors related to consonants, stress and intonation. However, the researcher adopted the use of convenient sampling in selecting the participants, and according to Awang (2012) convenient sampling is not appropriate for population inference and cannot be used for descriptive research simply because the researcher cannot say with confidence that the individuals are representative of the population. Soneye and Oladunjoye (2015) opined that Yoruba broadcasters often delete one consonant in two-consonant cluster in the coda to declusterize the cluster. Moreover, when there are three-consonant cluster in the coda, one consonant is usually deleted to reduce the weight of the cluster. For instance [lts] is produced as [ts], [lpt] is realized as [pd] and [kts] is pronounced as [ts]. The researchers were not able to trace any case of epenthesis from the respondents which they believed to exist in non-native English and suggest further research into the Nigerian phonology of English to identify the process. In response to this call, the present study seeks to capture cases of epenthesis in the speech of the Hausa broadcasters in Nigeria.

Purpose of the Study

The purpose of this paper is to examine and analyze the phonotactics articulation of broadcasters of English in Nigeria.

Optimality Theory

The Optimality Theory framework was adopted to describe and analyse the phonotactics of broadcasters. OT was introduced by Prince and Smolensky (1993) and developed by Prince and McCarthy and Prince (1993). The theory proposes that form is acted on simultaneously by hierarchically-ordered constraints that belong to one of two families of Markedness, Faithfulness and Alignment Constraints. However, this study is cantered within Markedness and Faithfulness Constraints. Markedness constraints require the output representation to be less marked, whereas the Faithfulness constraints require the output being faithful to the input (Kager, 1999; McCarthy, 2002, 2008). Moreover, these different types of constraints are hierarchically ordered and evaluated in a parallel fashion so as to generate the output (Kadenge, & Mudzingwa, 2012). Chomsky and Halle (1968) opine that languages encompass set of universal principles which are available in all human languages. These constitute the grammatical rules which guide the functions and operations of every language. Within the grammar of every language, some properties are universal whereas others are language specific.

Markedness Constraints

The followings are the MARKEDNESS CONSTRAINTS identified to capture the structural well-formedness of the output.

Table 1. Markedness Constraints

CONSTRAINTS	DESCRIPTIONS
*COMPLEX^{ONSET}	Onset are simple (Kager, 1999)
*IDENT ^{CONT}	The occurrence of continuants is prohibited (Barlow, 2001).
*COMPLEX ^{CODA}	Codas are simple (Kager, 1999)
*VOICED-CODA	Voiced obstruent in the coda is prohibited (Barlow, 2001).

Faithfulness Constraints

The preservation of the features of the input in the output is governed by a set of FAITHFULNESS CONSTRAINTS which require input segments to have correspondents in the output.

Table 2. Faithfulness Constraints

CONSTRAINTS	DESCRIPTIONS
MAX –IO	Every segment in the input has a correspondent in the output (McCarthy & Prince, 1993).
DEP- IO	Output segments must have input correspondent (No insertion) (McCarthy & Prince, 1993).
IDENT-IO (F)	If a segment has a feature [αF] in the input, then it must be specified as [αF] In the output ((Barlow, 2001).
FAITH C	The coda in the output must be identical to the coda in the input ((Barlow, 2001).

Methodology

Descriptive qualitative research design was adopted. Data were obtained through Production Test of list of English words and Recording of News Broadcasts direct from the stations. The production test was conducted by the researcher with the aid of a research assistant. It took six months to record the data. This is because of their schedule of duty and to be able to capture varieties of news presentations. The bulletins recorded included: News Line BRC 5: 00 p.m. local time and World News Globe F.M Radio 11. 00 a.m. local time. Others were NTA Bauchi News 7.00 p.m. and BATV News 7.30 p.m. The researcher selected 20 broadcasters as participants from 4 electronic media in Bauchi who use the Hausa English accent. 5 broadcasters were selected from each of the stations. The recorded data were transcribed based on IPA and entered into Optimality Theory software which was programmed with the relevant constraints. The OT software analyzed the data and presented in tableaux in data analysis section. In order to ensure the reliability of the data, *Analyst Triangulation* and *Triangulation of sources* were adopted. Data obtained from the production test and recording of news broadcast were compared and found to be reliable. Moreover, the analysis were carried out by 2 different expects and the results remained consistent.

Findings

The tableaux capture cases of epenthesis and deletion in the articulation of consonant cluster in the onset and coda positions.

Two Consonant Cluster Onset

The process of epenthesis is realized when a segment is inserted in a syllable. In the present study a segment is inserted in the onset to break up the CC cluster. The study uses the Markedness constraint *COMPLEX [ONSET] and Faithfulness constraint DEP-IO to account for constraint marking in the speech of Hausa broadcasters.

Input /g r u: p/ ⟶ Output [g u. r u ɸ]

*COMPLEX [ONSET] >> DEP-IO

Table 1. OT Evaluation of vowel epenthesis at the onset of the RP English word group

Input /g r u: p/	*COMPLEX [ONSET]	DEP-IO
a. [g r u: p]	*!	
b. ☞ [g u. r u ɸ]		*

Markedness *COMPLEX [ONSET] is ranked higher than Faithfulness constraint DEP-IO. RP occurs with consonants cluster which violates higher ranked constraint *COMPLEX[ONSET]. The constraint bans the occurrence of consonant cluster at the onset (Kager, 1999; McCarthy, 2008). The RP obeys a lower ranked constraint DEP-IO. Hausa English output respects the higher ranked constraint *COMPLEX [ONSET] and breaks the lower ranked constraint DEP-IO which forbids epenthesis of a segment in the output. The constraints ranking is presented as *COMPLEX[ONSET]>> DEP- IO.

Input /k l ɑ: s/ ⟶ Output [k ɪ. l a s]

*COMPLEX [ONSET] >> DEP-IO

Table 2. OT Evaluation of vowel epenthesis at the onset in the RP English word class

Input /k l ɑ: s/	*COMPLEX [ONSET]	DEP-IO
a. [k l ɑ: s]	*!	
b. ☞ [k ɪ. l a s]		*

The two candidates RP and Hausa English show different preference on constraints rankings. The RP prefers Faithfulness constraint DEP-IO while Hausa English chooses Markedness constraint *COMPLEX [ONSET]. These differences indicate

variations of the two varieties. While the RP production has one syllable the Hausa broadcasters produced the word with two syllables.

Two Consonant Cluster Coda

The process of cluster reduction is realized when a segment is deleted in a syllable for simplification. In the present sample, final consonant(s) are deleted to reduce the cluster. The study uses the Markedness constraint *COMPLEX^{CODA} and Faithfulness constraint MAX-IO to account for constraint marking in the speech of Hausa broadcasters.

Input /s ɪ k s/ ⟶ Output [s ɪ s]

*COMPLEX ^{CODA} >> MAX-IO

Table 3. OT Evaluation of cluster reduction in coda of the RP English word six

Input /s ɪ k s/	*COMPLEX ^{CODA}	MAX IO
a. ☞ [s ɪ s]		*
b. [s ɪ k s]	*!	

The optimal output is Hausa English because it obeys higher ranked constraint *COMPLEX ^{CODA} and disobeys MAX -IO which prohibits deletion of a segment in the output. RP output suffers serious violation of the higher ranked constraint *COMPLEX ^{CODA} which forbids the occurrence of consonant cluster in coda and is faithful to MAX-IO which is a lower ranked constraint.

Input /ɪ g. z æ k t/ ⟶ Output [e g . z a t]

*COMPLEX ^{CODA} >> MAX-IO

Table 4. OT Evaluation of cluster reduction in coda in the RP English word exact

Input /ɪ g. z æ k t/	*COMPLEX ^{CODA}	MAX IO
a. [ɪ g. z æ k t]		*
b. ☞ [e g . z a t]	*!	

Markedness constraint dominates Faithfulness constraint. Markedness constraint *COMPLEX ^{CODA} is indomitable constraint and it is ranked higher than Faithfulness MAX-IO. Hausa English dominates RP through the adherence to the higher ranked constraint. The deletion of a phoneme /k/ in the speech of Hausa broadcasters is in line with the phonotactic constraint *COMPLEX ^{CODA}.

Three Consonant Cluster Onset

The process of epenthesis is realized when a segment(s) is inserted in a syllable. In the present study a segment is inserted in the onset to break up the CCC cluster. The study uses the Markedness constraint *COMPLEX ^{ONSET} and Faithfulness constraint DEP-IO to account for constraint marking in the speech of Hausa broadcasters.

Input /s t r e s/ ⟶ Output /[s ɪ t r e s]

*COMPLEX ^{CNSET} >> DEP-IO

Table 5. OT Evaluation of vowel epenthesis at the onset of the RP English word stress

Input /s t r e s/	*COMPLEX ^{ONSET}	DEP-IO
a. [s t r e s]	*!	
b. ☞ [s ɪ t . r e s]		*

The constraints ranking in the tableau is presented as *COMPLEX ^{ONSET}>> DEP-IO. The RP English output fails to obey a higher ranked constraint *COMPLEX^{ONSET} which forbids the occurrence of consonant cluster at the onset (Kager, 1999; McCarthy, 2008) and obeys a lower ranked constraint DEP-IO. Hausa English output is faithful to the higher ranked constraint *COMPLEX^{ONSET} and contravenes the lower ranked constraint DEP-IO which forbids the insertion of an epenthetic vowel in the output (Barlow, 2001).

Input /s k r i: n/ ⟶ Output [s ɪ k . r ɪ n]

*COMPLEX ^{CNSET} >> DEP-IO

Table 6. OT Evaluation of vowel epenthesis at the onset of the RP English word screen

Input /s k r iː n/	*COMPLEX ONSET	DEP-IO
a. [s k r iː n]	*!	
b. ☞ [s ɪ k . r ɪ n]		*

Faithfulness constraint DEP-IO prohibits insertion of a segment in the output. This constraint is obeyed by the RP English and violated by the Hausa English. Markedness constraint *COMPLEX ONSET bans the occurrence of consonants cluster in the onset. The constraint is respected by the Hausa English and disagreed by the RP.

Three Consonant Cluster Coda

The process of cluster reduction occurs when a segment(s) is deleted in a cluster for simplification. In the sample below, final consonant (s) is deleted to reduce the cluster. The study uses relevant constraints to account for constraints marking in the speech of Hausa broadcasters.

Input /h ɪ n t s/ ⟶ Output [h ɪ n t]

*MAX-IO>> *IDENT^CONT >>IDENT-IO (F)

Table 7. OT Evaluation of cluster reduction in coda in the RP English word hints

Input /h ɪ n t s/	*MAX-IO	*IDENT^CONT	IDENT-IO (F)
a. [h ɪ n t s]	*!	*!	
b. ☞ [h ɪ n t]			*

*MAX-IO is used in order to permit deletion of a segment in the output. RP output occurs with three consonants cluster. This violates a higher ranked constraints: *MAX-IO which permits deletion of a segment in the output and *IDENT^CONT which prevents continuant /s/ from appearing in the output. Hausa English output fulfills the higher ranked constraint *MAX-IO and *IDENT^CONT. The candidate breaks lower ranked constraint IDENT-IO (F) which requires every segment in the input should have a correspondent segment of the same value in the output.

Input /m ɑː s k t/ ⟶ Output [m a s k]

*MAX-IO >> IDENT-IO (F)

Table 8. OT Evaluation of cluster reduction in coda in the RP English word masked

Input /m ɑː s k t/	*MAX-IO	IDENT-IO (F)
a. [m ɑː s k t]	*!	
b. ☞ [m a s k]		*

*MAX-IO dominates IDENT-IO (F). RP is faithful to IDENT-IO (F) by producing three consonants coda, Hausa English obeys *MAX-IO by deleting one of the three consonants in coda, The RP is concerned with identity relations between input and output while Hausa English focuses on the output.

Discussions

The findings reveal the systematic patterns of consonant cluster pronunciation both in the onset and coda positions in the speech of Hausa broadcasters. At the level of two consonant cluster onset, the participants frequently use epenthetic vowels to break up the cluster and pave the way to ease the pronunciation. The vowels used are high front short vowel /ɪ/ and high back short vowel /u/. At the two consonant cluster coda, the study reveals that the participants usually delete one of the two consonants to declusterize the cluster. The clusters identified in two consonant cluster coda are /kt/ and /ks/. It appears that the consonants deleted are usually plosive sounds that occur in the clusters. Simo Bobda (2000) also affirms that most of the African speakers of English employ the deletion strategy in their speech in order to simplify a cluster. This implies that the use of epenthesis and deletion in cluster simplification is not limited to only Hausa speakers of English, it cuts across Africa and other non-native speakers of English across the world. Similarly, at the level of three consonant cluster onset, the subjects also use same process of epenthetic vowel /ɪ/ to break up the cluster and realize the abutting consonant. The use of epenthetic vowels often creates another syllable in a word. For instance, the word *screen* /s k r ɪ n/ became [s ɪ k .r ɪ n] in Hausa English. The two consonants emerged in the medial position of the word are not consonants cluster because they do not belong to the same syllable. The /k/ is the final consonant of the first syllable (coda) while the /r/ is marking the beginning of the second syllable (onset). Moreover, at the level of three consonant coda, the respondents delete one of the three consonants to reduce the complexity of the cluster. The consonants deleted are usually plural and past tense markers.

From the foregoing, the study can deduce that the major phonological processes used by the majority of the respondents in pronouncing consonant cluster are epenthesis and deletion. The process of epenthesis is frequently used in the onset, whereas deletion is used in coda position. Mbah and Waya (2014) report that Tiv learners of English in Nigeria employ the use of epenthetic vowels both at the onset and coda position to simplify English consonant cluster. The findings support the presumption of Soneye and Oladunjoye (2015) who hypothesize that second language speakers of English in Nigeria are likely to insert epenthetic vowels to declusterize the consonant cluster and suggest for empirical study to validate the assertion. Moreover, English phonotactic articulations of broadcasters are different from RP as a results of epenthesis and deletion employed by the newscasters. However, Usman (2020) discovered the emergence of yod coalescence in the English spoken by Hausa broadcasters within the optimality theory framework which indicates an attempt to move closer to RP by Nigerian broadcasters particularly Hausa broadcasters of English.

Conclusion

Thus, the present study contributes in response to the call by Soneye and Oladunjoye (2015) and it identifies the phonological processes used by Hausa broadcasters in pronouncing syllable phonotactics. It should however be noted that the case of deletion used by the subjects alters the meaning of words and is likely to distort the communication. These changes have an effect on the meaning of words in terms of tense and number. It is, therefore, important for the broadcasters to pay attention and improve.

Recommendations

Further research is recommended on morphophonological realizations of the English spoken by Nigerian Broadcasters. The research is limited to syllable structure. Future research should look at the suprasegmental features such as stress and intonation patterns of Hausa broadcasters. Similarly, there is need to further investigate consonants and vowels articulations of Hausa broadcasters of English using Optimality Theory Framework. Media practitioners should intensify efforts toward retraining of broadcasters particularly on English segments that do not exist in Nigerian languages.

Limitations

The paper is on English phonotactic articulations of Hausa broadcasters in northern Nigeria. It examined articulation of clusters in onset and coda within the Optimality Theory framework.

Authorship Contribution Statement

Usman**:** Conceptualization, design, analysis. Kagu: writing and editing

References

Akpan, C. A., Luke, O. P., & Etu, M. (2012). the influence of mother tongue in the broadcasting industry in Nigeria. *An International Journal of Language, Literature and Gender Studies, 1*(3), 48-68*.* http://eprints.gouni.edu.ng/id/eprint/1027

Aladeyomi, S. A. (2013). Prevalence of standard british model of oral English in Nigeria: A case study of Nigerian television newscasters. *Online Journal of Education Research, 2*(3), 50-56. http://www.onlineresearchjournals.org/IJER.

Atechi, S. (2006). *The intelligibility of native and non-native English speech*. Cuvillier.

Awang, Z. (2012). *Research methodology and data analysis* (2nd ed.). University Technology MARA press.

Barlow, J. (2001). Optimality Theory and the Assessment and Treatment of Phonological Disorders, *American Speech-Language-Hearing Association*. *32*(4), 242-256. https://doi.org/10.1044/0161-1461(2001/022)

Chomsky, N., & Halle, M. (1968). *The sounds patterns of English.* Harper and Row.

Emeka-Nwobia, N., & Onu, M. (2013). Errors of Nigerian radio newscasters: A phonological analysis. *Global Journal of Applied Management and Social Sciences, 4*, 164 – 171.

Huber, M. (2004). Ghanaian English phonology. In B. Kortmann & E. W. Schneider (Eds.), *A handbook of English varieties* (pp. 843-865). Walter De Gruyter.

Kachru, Y., & Smith, L. (2008). *Cultures, contexts, and world Englishes*. Routledge. https://doi.org/10.4324/9780203891346

Kadenge, M., & Mudzingwa, C. (2012). Comparing chiShona loanwords of monolingual and bilingual speakers: An optimality theory analysis. *South African Journal of African Languages, 32*(2), 141-151. https://doi.org/10.2989/SAJAL.2012.32.2.5.1142

Kager, R. (1999). *Optimality theory*. Cambridge University Press. https://doi.org/10.1017/CBO9780511812408

Mbah, E., & Waya, D. (2014). A constraint based study of the Tiv learners of English phonotactics. *Innovare Journal of Social Sciences, 2*(2), 10-16. https://bit.ly/3xfrW8r

McCarthy, J. (2002). *A thematic guide to optimality theory*. Cambridge. https://doi.org/10.1017/CBO9780511613333

McCarthy, J. (2008). *Doing optimality theory.* Blackwell Publishing. https://doi.org/10.1002/9781444301182

McCarthy, J., & Prince, A. (1993). *Prosodic morphology: Constraint interaction and satisfaction.* Linguistics Department

Faculty Publication. https://bit.ly/3cM1lGk

Prince, A., & Smolensky, P. (1993). *Optimality theory: Constraint interaction in generative grammar*. Blackwell.

Simo Bobda, A. (2000). Comparing some phonological features across African accents English. *English Studies, 81*(3), 249-266. https://doi.org/10.1076/0013-838X(200005)81:3;1-M;FT249

Soneye, T. (2007). Phonological sensitivity of selected NTA newscasters to sound-spelling discrepancy in English and its implications for oral English. *Marang: Journal of Language and Literature*, *17*(1), 29-42 https://doi.org/10.4314/marang.v17i1.39308

Soneye, T., & Oladunjoye, F. (2015). Syllable phonotactics in educated Nigerian spoken English**.** *Konin Language Studies, 3*(3). 255-269. https://bit.ly/3HHpkVH

Usman, A. (2020). Optimality account of yod coalescence in the English spoken by Hausa broadcasters in Nigeria. In M. A. Mu'azu, S. U. Bulakarima, M. Munkaila, A. K. Shetiima & M. Fannami (Eds.), *Language, Literature, History and Pedagogy* (pp. 224 - 246). Scholars' Press.

Yavas, M. (2011). *Applied English phonology* (2nd ed.). Blackwell. https://doi.org/10.1002/9781444392623