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Featural Identity and the Obligatory Contour Principle: Perspective from the Sound Pattern of Standard British English and Nigerian English

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Abstract

Yip (1988) shows that, in English, the insertion of /ɪ/ between coronal sibilants, e.g., /s/ and /z/ in plural nouns like /fɒksɪz/ foxes, /tæksɪz/ taxes, etc. and the prohibition of geminate stress, as in *thirˈteen ˈmen is motivated by the Obligatory Contour Principle (OCP). She argues that /ɪ/-epenthesis and geminate stress avoidance are triggered in the language to satisfy the OCP, which prohibits adjacent identical elements in phonological representation. In this study, we show that the OCP also explains why: (i) English inserts /ɪ/ between coronal sibilants in genitive forms, ruling out */rəʊz(z) pɜːs/ 'Rose's purse', (ii) the language drops yod after post-alveolars, /ʧ/, /ʤ/ and /ʃ/, ruling out */ʧju/, 'chew', */ʤju/ 'Jew', and (iii) it disallows heteromorphemic geminate consonants, e.g., /t # t/ by making them undergo fusion, /t/. This study investigates the extent of applying these native English OCP-motivated rules in Nigerian English (NigE) based on the data gathered from fifty educated NigE speakers. Results of the frequency count and constraint-ranking in this study showed that the OCP-based native English rules in NigE could be inviolable (56.48%) or violable (43.52%). We argue that the frequency of NigE violation of the OCP is in part determined by the complex nature of the sequential combinations of English identical features and the NigE speakers' level of competence in English usage.

Keywords: OCP, Standard British English, Nigerian English, phonological rules, constraints ranking, frequency count

Introduction

Phonologists have long observed the natural tendency for languages to disallow structures whereby feature(s) of tone, stress and segment are repeated in lexical (or morphological) representations. Some authors like Goldsmith (1976), McCarthy (1982), (1986), (1988), Liberman & Prince (1977), Prince (1983) and Yip (1988) have argued that languages normally have preference for dissimilatory values, such as preferring x^0 to x^0x^0 on any given tier within the derivation. From phonetic perspectives, pieces of evidence from native grammars (e.g., English, Arabic, etc.) suggest that many languages naturally sanction distinct adjacent x^0x^1 features while disallowing identical consecutive features, such as x^0x^0 features. Results from the Obligatory Contour Principle (OCP) related research investigations show that the preference for dissimilation (or delinking of a superfluous feature) is due to the dire need to enhance perception, as a clash of the 'same' feature, x^0x^0 tends to blur auditory perception of speech and consequently impairs comprehension on the part of the hearer.

Phonologists such as Leben (1973), Goldsmith (1976), who first discovered this linguistic tendency for languages to avoid similarity of adjacent elements in representations, suggest that the OCP is the condition that influences languages to avoid featural duplication in phonological representations. The researchers, some mentioned above, have shown that avoidance of adjacent identical elements, in part, results from concatenation effects that occur at both the lexical and morphemic domains. Such identical structures include identical tones, the same stress degrees, repeated segments, and identical phonemic features. As a condition on morpheme structure, following Goldsmith and Leben, McCarthy (1988), cited in Clements and Hume (1995) stated the OCP succinctly; thus, "adjacent identical elements are prohibited" (p. 262). Yip (1988), therefore, argues that the need to avoid two consecutive coronal consonants /s/ and /z/ in the English plural formation systems, specifically in words such as *fo**xes***, *ta**xes***, *chur**ches*** etc. Motivated the /ɪ/-insertion rule. She argues that the insertion rule is driven by the OCP, since it (the OCP) prohibits adjacent identical coronal features from occurring in phonological derivations.

Studies on OCP effects on segmental bound adjacency-repetition problems have focused primarily on first language (L1) phonologies, mostly in some varieties of (Classical) Arabic, in English, some language groups of the Estonian and Lithuanian extraction, Koya-India, Afar-Ethiopia, Chukchi-Siberia, among others. Presently, to our knowledge, no studies appear to have been carried out on OCP effects on second language (L2) phonologies. Thus,

this study perhaps is the first empirical study making a contribution that accounts for OCP-based native (L1) phonological phenomena in the L2 context. Specifically, the study examines the effects of the empirical content of the OCP in a domesticated English accent of Nigeria, a country located in sub-Saharan Africa.

Crucially, the study examines the functional operation of the OCP in native Standard British English (SBrE), which is the superstrate language and Nigerian English (NigE), the substrate language. In this study, bearing in mind the effect of interference in L2 usage, we attempt to explore four SBrE phonological rules and consequently find out whether speakers of NigE stringently observe the OCP conditions on the four English structures as do the British native speakers. The four phonological rules are:

(a) /ɪ/-insertion rule, which, like in English noun formation, applies in genitive (possessive =POSS) forms. For instance, the /ɪ/-insertion rule applies in the form, such as /rəʊzɪz pɜ:s/ Rose's purse', thus ruling out */rəʊzz pɜ:s/ or */rəʊz pɜ:s/ as a correct form.
(b) Yod rule blocking/dropping, which is categorically blocked or dropped after post-alveolar consonants, /ʧ/, /ʤ/ and /ʃ/ if followed by /u:/ (or /ə/) in native English, and consequently rules out the ill-formed strings */ʧju:/, 'chew' and */ʤju:/ 'Jew' but sanctions /ʧu:/ and /ʤu:/ respectively.
(c) Geminate stress avoidance rule, in which the 'thirteen men rule' (i.e., stress reversal rule) applies, thus ruling out the ill-formed pronunciation *thirˈteen ˈmen but sanctions ˈthirteen ˈmen.
(d) Fusion of heteromorphemic geminate consonants /C.C/ as /C/ in fast speech, as in /ˈgʊd + ˈdeɪ/ 'good day', in which the first consonant is fused into the second consonant, thus sanctioning the surface form, [ˌgʊˈdeɪ] but ruling out the ill-formed surface form, *[ˌgʊdˈdeɪ].

Based on the above-listed OCP-based phonological phenomena in SBrE, we will show via the simple percentage formula that L2-based OCP effect, like L1-based OCP effect extensively discussed in the literature is not absolutely universal (Goldsmith 1976, Odden 1988, 2013), and hence is potentially violable. More significantly, we will show that the observance or non-observance of the OCP effect in NigE depends, on the one hand, by the complex nature of the sequential combinations of identical gestures (i.e., features), and, on the other hand, on the L2 speakers' competence in native standard English pronunciation. In other words, some specific native OCP-driven rules could better be applied in NigE than others depending on the complexity of consecutive identical gestures, and speakers' phonological competence/awareness.

To account for the extent of observance of the OCP in NE, which is expected to be validated by the simple percentage calculations in this study, we will adopt the non-linear models: Autosegmental Theory (Goldsmith) and Grid Theory (Prince) together with Optimality Theory (OT) (Prince & Smolensky 1993). We adopt the first two theory because some type of OCP effects is assumed to be a primitive of the autosegmental theory, where the occurrence of adjacent identical elements are valid on any given tier (McCarthy 1988). We employ the last theory to account for constraints interactions militating against 'adjacency-identity problems' attested in the two Englishes, bearing in mind the assumption that the OCP is a primitive of autosegmental theory has been challenged (Boersma 1998), (Frisch et al. 2004). Nonetheless, we will not be concerned with the argument here, as it is beyond the scope of this work.

Mechanism of the obligatory contour principle in native phonologies

Crosslinguistically, the OCP may operate at two levels of representations, the input and output levels (McCarthy), based on insights from L1 structures. Based on the implementation of the four SBrE rules in NigE, we will assume that, like in L1 phonologies, the OCP invariably influences phonological patterns of a second language (L2) as well. Accordingly, the OCP operates at both levels of representation in the L2 phonology, where English, as the source language, serves as the input and the actual utterances produced by the NigE informants serve as the output.

It is well known that at the heart of the underlying and surface representations in the superstrate phonology are some 'specific' (not all) types of phonological rules sensitive to the condition of the OCP re-stated in our version in (1) as follows:

(1) Obligatory contour principle (OCP):

Only distinct (no identical) features are allowed within any given tier

Under the restriction/condition in (1), which invokes the notion of 'dissimilation', the specific segmental (or stressal/rhythmic) rules influenced by the OCP are broadly classified into two. First, phonological rules triggered by the OCP, known as OCP-rule triggers. And second, phonological rules blocked by the OCP, referred to as OCP-rule blockers. According to Clements and Hume (1995), the OCP has three-fold empirical content, which is listed in (2) as follows:

(2) Three-fold empirical content of the OCP (Clements and Hume, 1995, p.262)

i The OCP may prohibit underlying representations which

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violate it.

ii. It may "drive" or motivate rules which suppress violations of it.

iii. It may block rules that would otherwise create violations of it.

To make the mechanism of the OCP and its three-fold empirical content in (2) more revealing, we draw examples from three native phonologies, namely English (Germanic), Ewulu (Igboid, West Benue-Congo: Nigeria), and Afar (Cushitic, Afroasiatic: Ethiopia, Djibouti) to increase our understanding of how the OCP acts a as condition on similarity structures in languages.

The OCP-rule trigger

The OCP-rule trigger: The English example

English (Germanic) exhibits an interesting phonological rule which is assumed to be triggered by the OCP. Yip (1988) presents the English plural formation rule operating in three ways: (i) suffixation of /z/ to any nouns if their segment ending is a voiced consonant, (ii) suffixation of /s/ if their final segment is a voiceless consonant, and (iii) suffixation of /ɪz/ if their final segment is a coronal sibilant. Respectively, the three rules explain why the pluralisation patterns in the noun words, *seed/z/* 'seeds', *seat/s/* 'seats', and *stich/ɪz/* 'stiches' vary. According to Yip (88-90), the insertion of /ɪ/ in the latter rule application is triggered to avoid two consecutive coronal segments, /ʧ/ and /z/, from occurring, since the two consonants are specified with the same feature [coronal], and if no contrasting feature is introduced (or inserted) between the two coronal consonants, the OCP would be violated on the Coronal-tier. In Section 5, we would argue that the rule inserting the epenthetic /ɪ/ in native SBrE genitive (i.e. POSS) form of nouns is motivated by the OCP as well.

The OCP-rule trigger: The Ewulu example

Ewulu (Igbo variety: West-Benue Congo, southern Nigeria) the OCP effect adjusts the structure of some input structures that otherwise violate the OCP (Utulu 2006). For instance, certain underived and derived morphemes undergo consonant syncope. Utulu (11) ascribes the syncope rule to the effect of the OCP. The input forms, such as /o**l**ulu/ 'cotton', /a**k**ɪkɔ/ 'story/tale', /a**f**ʊfʊ/ 'hardship', /o**l**ile/ 'buying', and /o**m**umo/ 'hoe' are respectively realised as [oulu], [aɪkɔ], [aʊfʊ], [oile] and [oumo]. He suggests the deletion of the first (in bold print) of two identical consonants, /…C…C/ becoming […C…], yielding the output syllable shape VVCV, differing from the input VCVCV shape, is motivated by the need to avoid OCP violation. His assumption is based on the fact that the consonant feature and vowel feature

of the forms are arrayed on separate tiers, thus, compelling the consonant feature to be adjacent to a copy of itself. Native language examples such as this demonstrate the fact that the OCP does trigger rules cross-linguistically to avoid similarity of structures/features.

OCP-rule blocker
The Afar example

One of the three-fold empirical content of the OCP (see 2, iii) states that the OCP may employ rule-blockers as alternative rules to suppress its violation. The Afar (Cushitic: Afroasiatic, Ethiopia, Djibouti) language presents an interesting native language data expressing the blocking effect. McCarthy shows the OCP-blocking effect in two separate rules: Vowel Deletion and Antigemination. In the former rule, McCarthy shows that unstressed penultimate vowels in the forms, *xam**í**la*, *ʕag**á**ra*, and *dar**á**gu* (in underlined bold print) are deleted. Subsequently, the deletion yields the respective forms, *xaml-i*, 'swamp grass', *ʕagr-i*, 'scabies', and *darg-i* 'watered milk'. However, McCarthy opines that the deletion rule is suppressed, or blocked in the forms *miḍaḍi* 'fruit', *sababa* 'reason', and *xarar-e* 'he burned'. McCarthy argues that suppose the syncope rule is allowed to apply, it will generate geminate strings, such as **mi**dd**i, *sa**bb**a, and *xa**rr**-e*, which violates the OCP, and the morpheme structure condition of the language. Thus, to avoid gemination, which violates the OCP, Afar blocks vowel syncope in *miḍaḍi*, *sababa* etc. As it will be shown in (Section 3.2), a curious OCP rule blocker may apply in English, where Yod is prevented from applying after palatal/post-alveolar consonants.

Four OCP-driven phonological rules of (British) English
Genitive forms of nouns and the /ɪ/-insertion rule in English

Regardless of arguments from linguists as to whether the English POSS marker is a clitic or edge inflection (Zwicky, 1987), it is a well-known fact (one with which the aforementioned author agrees) that in native English morphophonology, the head of a possessive noun phrase characteristically surfaces with three genitive POSS markers, namely, [s], [z] or [ɪz] indicated with the clitic affix, 's'. The three phonetic materials are derived from the abstract, /z/ which attaches directly to POSS nouns, subject to the *voicing* and *coronality* properties of the consonant-ending of the head noun. Like the rule that assigns the phonological materials in the English plural system reported in Clements (1985), Sagey (1986), and Yip (1988), [s] is attached to POSS nouns if their final segment is a voiceless consonant, [z] to POSS nouns if they end in a voiced consonant, and [ɪz] (or [əz]) if they end in a coronal sibilant.

Thus, the morphophonological rule of English explains why the following output forms, /fɪləps/ in 'Philip's car, /bægz/ in 'bag's fastener',

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/fɪʃɪz/ in 'fishes' nets' take different structural patterns. As we mentioned earlier, the consonant ending of each of the head nouns governs what specific rule may apply. Importantly, as we will demonstrate in Section 5, our concern is on /ɪ/-insertion in the body of our data reflecting POSS noun inflection rule and their implementation in NigE accent.

Yod rule in English

The term 'Yod' refers to the palatal glide /j/ (Wells, 1982) (Simo Bobda, 2007) (Glain, 2012). Yod derives from the historical type-/ɪu/ diphthong. According to reports, the palatal glide surfaced in the phonology of English when some middle English vowels had merged into what Wells referred to as 'falling diphthong' (206), specifically from the complex sequence, /ɪu/. The Yod rule is a regular feature of SBrE (but typically not quite active in General American English). Yod occurs contextually; it is found after a consonant (other than liquid /l/ or /r/, palatal /j/, post-alveolar affricates /ʧ/, /ʤ/, and post-alveolar fricative /ʃ/) then immediately followed by /u:/. Consequently, in SBrE, words such as *tune*, *assume*, *cute*, *new*, among many identical forms, have /j/ inserted. This explains why in SBrE, these words are pronounced /tju:n/, /əsju:m/, /kju:t/ and /nju:/ respectively.

However, in sequences in which a consonant (C) is followed by liquids, i.e. /Cl/ and /Cr/ sequence, /j/ is dropped. This constraint thus, prohibit ill-formed strings such as */clju:/ 'clue', */blju:/ 'blue' and /krju:/ 'crew', /brju:/ 'brew', respectively. Only the forms, /clu:/, /blu:/, /kru:/, and /bru:/ are sanctioned in the language. Moreover, in native English, after post-alveolar affricates and fricative, yod insertion is disallowed. In NigE, however, the Yod rule applies inordinately (Simo Bobda, 2007). Thus the "[…] rule explains the absence of /j/ in [ʃʊgə] (not *[ʃjʊgə] *sugar*, [ʧu:] *chew* […]" in English (288). Because Yod applies rather inordinately in NigE, it tends to be overapplied, as our data in this study tend to suggest.

Despite available studies on the subject of Yod both in native and non-native phonologies, which have explained the constraints cum contexts under which /j/ may be inserted or dropped, none of them (to our knowledge) has made reference to the fact that the suppression (or blocking) of Yod after /ʃ/, and /ʧ/, /ʤ/ and /u:/ is motivated by the OCP. Thus, in Section 5, we will show that the suppression of Yod after affricates /ʧ/ and /ʤ/ and fricative, /ʃ/ is a curious type of 'OCP-rule blocker' required in SBrE phonology to avoid adjacency of consecutive [+palatal] consonants that otherwise violate the OCP. However, examining how the Yod rule is handled in NigE accent after the palatal consonants, and its implication for the duplication theory is one of the goals of this study.

Geminate stress avoidance in English

English is one of the languages whereby stress is hierarchical. It is typical of the language for a prominence hierarchy to occur among multiple stresses (Liberman 1975; Liberman & Prince 1977; Prince 1983; Kager 1995). This may be the case when two or more words are concatenated in the formation of phrases. The combination of two words may, therefore, create a situation whereby two contiguous prominent/strong stresses 'clash', thereby violating the natural alternation of both stresses in regular intervals in the native English rhythmic pattern. A classic example of stress clash avoidance, also known as geminate stress avoidance, Yip (1988) comes from the archetype English combination, 'thirteen' and 'men'.

The 'thirteen-men' combination invokes the notions, 'the rhythm rule' or 'stress shift' in the literature Selkirk (1984), Schane (2007), where stress assigned on the last syllable (unary foot) *-teen* is said to be retracted leftward to avoid a clash with that assigned on the following foot, *men*. As established in the literature, the adjacent stress sequence in 'thir'*teen* 'men' will be realised phonetically as ''*thir*teen 'men', in which the first stress is moved farther away to the left. Otherwise, as observed in our current data, a 'clash' would result. The clash thus explains why Yip refers to the phenomenon as 'geminate stress', modeled on the heading of this sub-Section. As Yip opines, however, stress reversal of this type is not always observed in English for no obvious reason.

Following Liberman, and Prince, Yip assumes that the two underlying prominent stresses in *-teen* and *men,* if not resolved by retracting the stress assigned on the first syllable, *thir,* OCP violation would result, particularly when viewed from an autosegmental perspective. Therefore, she opines that the "clash avoidance [is] another instance of the blocking effect of the OCP demonstrated by McCarthy in the case of antigemination, since 'stress clash' would be an OCP violation (p. 90)''.

In this study, we examine our current set of data incorporating the native English Stress Reversal Rule (SRR) to ascertain whether the NigE participants observe stress-shift or not, as Akinjobi (2006) had previously investigated exclusively using Yoruba (Nigeria) participants.

Heteromorphemic geminate consonants and the fusion rule in English

Phonologists agree that speech sounds are not indivisible atoms (Katamba 1989; Schane 1973). The cross-linguistic tendency for structural symmetry in phonological systems is valid in the predisposition of languages to exploit the same phonetic parameters in constructing their phonological systems. Consequently, there are patterns (i.e., featural assimilation) attested in every language and therefore recur quite frequently to justify this observation. It is an established phonological fact that, in languages, the

assimilation rule naturally applies to achieve 'ease of articulation'. This is mostly due to physiological factors, where a specific articulatory gesture needs to be aligned in some way to achieve synchrony (i.e., enhance production) with another articulatory gesture, especially during fast speech.

Typically, where gestures align in the same feature(s), speech production tends to be enhanced for the benefit of speakers, but regrettably, to the 'detriment' of perception on the part of hearers. The consequence of the latter case is the potential inhibition of intelligibility, which is key to effective communication between interlocutors.

However, in this study, we shall consider how the OCP influences the assimilation effect within consonant features in certain English constructions, such as *'good day'*, *'red deer'*, '*big game'* etc., where the concatenation of words might result in the adjacency (or overlap) of identical boundary consonant features tagged in this work as *heteromorphemic geminate consonants*. We will, therefore, show that the combination of similar juncture consonants in the examples above results in the *merger* or *absorption* of the first consonant to the second one, a process we assume here to be fusion (see Crystal, 2008). Accordingly, we will argue that the rule that conflates the heteromorphemic sequence, /t#t/ /d#d/ and /g#g/ in the respective consonant sequences in English speech is enforced by the OCP to avoid its violation, a phenomenon that validates the fact the OCP is a condition on adjacent identical elements (McCarthy 1988; Yip 1988).

Methods

The data

The data for this study, comprising twenty-five English constructions, were purposively stratified into two categories to test: (1) Nigerian English renditions that conformed to native accents. (2) Nigerian English pronunciations that deviated from native pronunciation. Engaging fifty educated speakers from Nigeria in reading and recording sessions, we carried out a test on the following English rules: /ɪ/-insertion rule in genitive forms, Yod Insertion Rule, and Geminate Stress Avoidance Rule, and Consonants Fusion rule operating at phrasal boundary. The stratification of the data into the two, the ones conforming to native pronunciation, and the ones deviating from the native norm is, on the one hand, to help us establish the fact the OCP is inviolable, as suggested in the literature on native phonologies (McCarthy 1988; Yip 1988), and on the other hand, to help us establish the fact the principle is violable Goldsmith (1976), Odden (1988, 2013), Boersma (1998) and Frisch et al (2004). Importantly, we expect that the two factors would help our understanding of how the OCP functions in both the native and non-native phonologies.

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Participants

The participants engaged in this study were fifty educated homegrown Nigerian citizens. Thirty informants (ten each) are from the three major Nigerian languages, namely, Hausa, Igbo and Yoruba, while twenty (ten each) are from Edo and Urhobo. Of the figure, twenty-eight were males and twenty-two females. The participants possess a minimum of a university degree from different fields of the humanities and sciences. Four reading materials were administered to them. The first material incorporated five noun phrases with genitive form of nouns to test their performance on /ɪ/-insertion in the POSS forms. The second material incorporated five simple sentences to test Yod-dropping process after palatals.

Moreover, the third material comprised five Adjective+Noun type of phrases to test the participants' performance on the SBrE Rhythm Rule, specifically that which Stress Clash is typically avoided in the native accent of SBrE. Lastly, we administered ten sentences to the participants to test performance on Consonant Fusion at word/morpheme boundary in connected speech. We then recorded their rendering of the materials to determine potential native and non-native pronunciation for subsequent statistical and perceptual analyses, which we assume would complement the theoretical analysis of the data. We did the recordings using a digital Zoom H2 Handy Recorder. A male and a female native British English speaker served as Control. In addition to the two native speakers, we used the e-Dictionary (2008) Cambridge Advanced Learner's Dictionary, 3rd Edition, to validate the performance.

Analytical procedure

To determine whether the OCP effect was observed or not in the participants' performance, implicating the non-violability or violability of the OCP on representations in L2 phonology, as established in L1 phonologies in previous studies, we subjected all correct pronunciations and deviations in the data to three analytical procedures. First, we engaged a frequency count of the data using the simple percentage formula. We then complemented the statistical method by adopting the clustered column chart extracted from Microsoft Office Excel to provide graphic representations of the relative degree of the native and domesticated pronunciations of the NigE participants. Second, we analysed the perceptual-based L2 data autosegmentally, since some type of OCP-based phonological phenomena is assumed to be valid within any tier (McCarthy 1988). Lastly, we appealed to the Optimality Theory (Prince and Smolensky 1993) to capture constraints interactions that provide explanation for the four English OCP-induced phonological rules outlined in the foregoing.

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Results and discussion

Frequency count analysis

In this Section, we analyse the data using simple percentage formula to determine the percentage degree (or significance) of native pronunciation and domesticated pronunciation elicited from the NigE data. All calculations and derivation of percentages are based on the figure of near-native pronunciation (as well as figure of non-native pronunciation) multiplied by a hundred and then divided by the overall score of the token of each of the rules tested. The simple percentage calculations are presented below.

Frequency count of the performance on the English possessive form of nouns

In Table 1, we present the percentage score of the NigE participants' performance on the SBrE /ɪ/-insertion rule in genitive/POSS form of nouns, as follows:

Table 1. NigE participants' performance on /ɪ/-insertion rule in POSS nouns

S/N	SBrE control perform-ance in POSS noun	Expected Score	Participants' application of /ɪ/-insertion rule	% Score	Participants' nonapplica-tion of /ɪ/-insertion rule	% Score
(1)	[rəʊzɪz pɜ:s] '…Rose's purse'	50	8	16%	42	84%
(2)	[fɪʃɪz nets] '…fishes' nets'	50	23	46%	27	54%
(3)	[wɒʧɪz keɪs] '…watch's case'	50	39	78%	11	22%
(4)	[ʧɑ:lsɪz belt] '…Charles' belt'	50	11	22%	39	78%
(5)	[ʤɔʤɪz kəθi:drəl] '…St George's cathedral…'	50	45	90%	5	10%
	TOTAL	**250**	**126**	**50.4%**	**124**	**49.6%**

Given the comparative percentage of the frequency count of application (correct pronunciation) and non-application (incorrect pronunciation) of the English /ɪ/-insertion rule in Table 1, we may present a clustered column chart in Figure 1 to capture the relative values graphically as follows:

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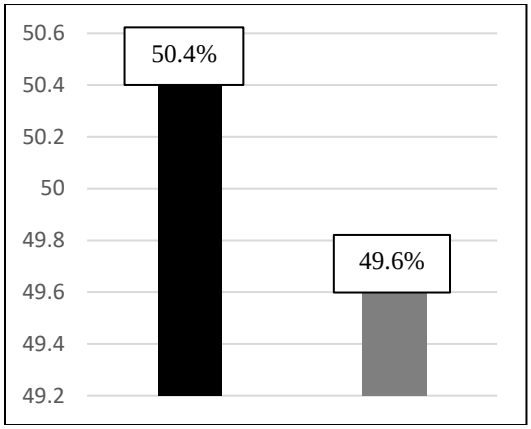

Figure 1 – Visual information showing the relative values in Table 1.
Application of /ɪ/-insertion rule in POSS noun.
Non-application of /ɪ/-insertion rule in POSS noun.

As the values in Table 1, charted in Figure 1, indicate, the percentage of the participants that applied the SBrE /ɪ/-insertion rule and that of the participants that failed to apply the rule is almost the same. However, it is interesting to note that the application of the epenthetic rule appears to be salient in the context where affricates are adjacent to the POSS marker /z/. By implication, the statistics results show that /ɪ/-insertion rule POSS is not stringently observed in NigE, given the insignificant 8% realised in the difference between 50.4% and 49.6%. However, the implication of the relative percentage in Table 1 on our current theoretic approach would be laid bare in Sections 5.2 and 5.3.

Frequency count of the performance on the English Yod rule

In Table 2, we present the percentage score of the NigE participants' performance on the English Yod rule, where the informants significantly 'overapply' the rule in *chew*, *Jew*, juice, *issue*, and *tissues* incorporated within the string of utterances tested. From the statistics, a significant number of the participants rendered the respective words as */ʧju:/, */ʤju:/, */ʤju:s/, */iʃju:/ and */tiʃju:/, while others produced native forms, /ʧu:/, /ʤu:/, /ʤu:s/, /iʃu:/, where /j/ was dropped as expected. The relative values of the two performances are presented below:

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Table 2. NigE participants' overapplication of the English Yod rule after /ʧ/, /ʤ/ and /ʃ/ consonants

S/N	SBrE control perform-ance on Yod	Expected score	Participants' application of Yod	% Score	Participants' non-application of Yod	% Score
(1)	/hɑ:d tu ʧu:/ '…hard to chew'	50	03	6%	47	94%
(2)	/hiz ə ʤu:/ 'He's a Jew…'	50	15	30%	35	70%
(3)	/teɪk sʌm ʤu:s/ '…take some juice'	50	17	34%	33[3]	66%
(4)	/ɪts æn ɪʃu:/ 'It's an issue…'	50	19	38%	31	62%
(5)	/ə rəʊl əv tiʃu:s' '…a role of tissues'	50	23	46%	27	54%
	TOTAL	**250**	**77**	**30.8%**	**173**	**69.2%**

Based on the relative total percentage figures in Table 2, we may present a clustered column chart in Figure 2 to show the values graphically, thus:

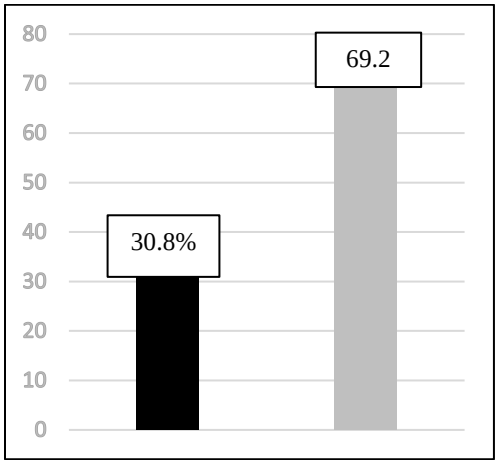

Figure 2 – Visual information showing the different values in Table 2.
Application of Yod insertion rule after /ʧ/, /ʤ/ & /ʃ
Non-application of Yod in the same context.

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The total percentage of the values in Table 2, and Figure 2, (suggesting a difference of 38.4%) implies that Yod insertions in the participants' rendition is rather inordinately applied, a result that corroborates Simo Bobda's (2007:288) observation. The consequence of the Table 2 result on our theoretical approach in Sections 5.2 and 53 would be brought to the fore.

Frequency count of the performance on English geminate stress avoidance

This Section presents the percentage of the participant's performance on SBrE geminate stress resolution otherwise known as 'thirteen men rule' in some selected phrases, where we expect the strong leftward stress to be retracted further to the left to avoid a clash with the strong rightward stress. The results are presented in Table 3:

Table 3. NigE participants' performance on native stress clash resolution

S/N	SBrE control performance on geminate stress avoidance	Expected score	Participants' application of geminate stress avoidance	% Score	Participants' non-application of geminate stress avoidance	% Score
(1)	[ˈθɜːtɪn ˈmen] '…thirteen men'	50	0	0%	50	100%
(2)	[ˈkɑːtuːn ˈnetwɜːk] '…cartoon network…'	50	3	6%	47	94%
(3)	[ˌʧɪmˈpænziː ˈtəʊz] '…chimpanzee toes'	50	0	0%	50	100%
(4)	[ˈbɪtwiːn ˈʤɒn] '…between John (and…)'	50	0	0%	50	100%
(5)	[ˌʃiː spiːks ˈɪŋglɪʃ] 'She speaks English…'	50	0	0%	50	100%
	TOTAL	**250**	**03**	**1.2%**	**247**	**98.8%**

We present, in Figure 3, a graphic representation of the relative percentage values in Table 3 thus:

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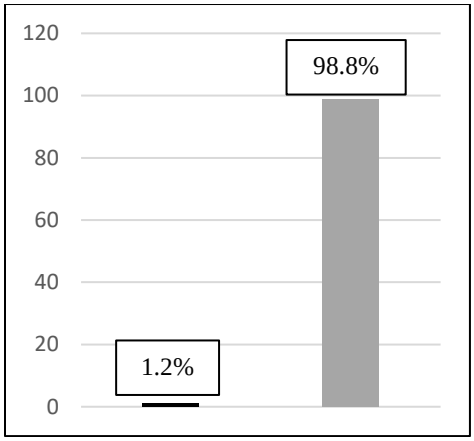

Figure 3 – Visual information showing the contrasting values in Table 3.
Application of geminate stress
Non-application of geminate stress

As can be seen, there is a sharp contrast between the values of the accurate use of the native rhythm rule and deviations from the rule. The difference is quite a huge one, 97%. This remarkable variation is a reflection of two Englishes that have been described in the literature, one (English) as stressed-time rhythm language, and the other (NigE) as a syllable-/tone-timed rhythm language. Accordingly, we would bring to the fore the implication of the significant percentage of deviation in L2 pronunciation to the theory of OCP, and constraints interactions in Sections 5.2 and 5.3.

Frequency count of the performance on heteromorphemic geminate consonants

Table 4 presents the percentage calculation of NigE participants' performance on heteromorphemic geminate consonants, where we expect the native fusion rule to apply across the board in the following constructions:

Table 4. NigE Participants' Performance on Heteromorphemic Geminate Consonants

S/N	SBrE control perform-ance on hetero-morphemic geminate consonants	Expected score	Participants' application of the fusion rule	% Score	Participants' nonapplicati on of the fusion rule	% Score
(1)	[ˌgʊˈdeɪ] 'goo**d d**ay…'	50	50	100	0	0%
(2)	[ˌredɪə] '…re**d d**eer…'	50	50	100	0	0%
(3)	[ˌbɪˈgeɪm] '…bi**g g**ame'	50	50	100	0	0%
(4)	[ˌtræfɪˈkəʊn] '…traffi**c c**one'	50	50	100	0	0%

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(5)	[ˌtɒˈbrɑːs] '…to**p** **b**rass…'	50	50	100	0	0%
(6)	[ˌflæˈtaɪə] '…fla**t** **t**yre'	50	50	100	0	0%
(7)	[ˌklæsiˈkɑː] '…classi**c** **c**ar'	50	50	100	0	0%
(8)	[ˌbæˈkɒpi] '…bac**k** **c**opy…'	50	50	100	0	0%
(9)	[ˌtʊərɪsˈtræp]'…touris**t** **t**rap…'	50	50	100	0	0%
(10)	[ˌsɪmpˈliːf] '…simp**le** **l**eaf'	50	50	100	0	0%
	TOTAL	**500**	**500**	**100%**	**0**	0%

As Table 4 shows, all the participants applied the fusion rule. The 100% accuracy in the implementation of fusion of identical juncture consonants, therefore, makes a graphical analysis of the result in Table 4 unnecessary.

However, we present deductions of the relative overall frequency count of native pronunciation versus non-native pronunciation recorded in Tables 1 through 4 in Table 5 as follows:

Table 5. Overall frequency count of participants' performance on four English OCP-induced phonological rules

S/N	Table	Overall expected score	Overall application of the four English rules	Overall % score	Overall non-application of the four English rules	Overall % score
(1)	Table 1	250	126	50.4%	124	49.6%
(2)	Table 2	250	77	30.8%	173	69.2%
(3)	Table 3	250	3	1.2%	247	98.8%
(4)	Table 4	500	500	100%	0	0%
	OVERALL TOTAL	**1,250**	**706**	**56.48%**	**544**	**43.52%**

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The statistics of Table 5 in a clustered in Figure 4 is as follows:

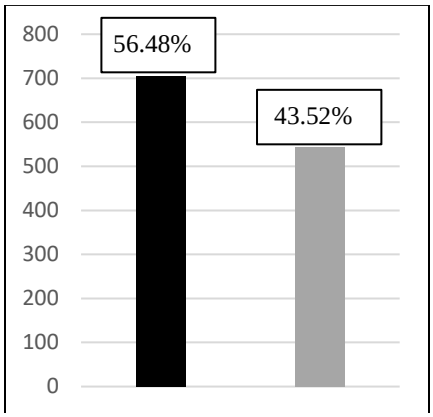

Figure 4 – Visual information of the overall relative differences in values of near-native and non-native pronunciation by NigE participants shown in Tables 1 through 4.

Participants' overall observance of the English OCP-motivated rule

Participants' overall non-observance of the rules.

Given the overall frequency count of the participants' observance of the OCP bound English rules, approximately (56.5%) and non-observance (43.5%) in Table 5 (and Figure 4), it will be noticed that the OCP is not hugely observed in L2 (NigE) phonology. Comparable to the Control's accurate processing of the four rules, a fairly significant 43.5% deviation from the native rule was recorded. Conversely, a 56.5% figure indicates that the OCP effect is potentially pervasive in the domesticated English. This, therefore, might suggest that observance of the OCP is rule/structure-specific, (considering the high percentage figures recorded in both the /ɪ/-insertion and heteromorphemic geminate consonant fusion rules).

Non-linear (autosegmental and grid) analysis

Any OCP-based rules (including the ones we have explored so far) are phenomena recognised as primitives in autosegmental phonology (McCarthy1988). Following McCarthy, we adopt the framework proposed by Goldsmith (1976) to explain the functional interpretation of L2-OCP effects operative on the rules espoused in Tables 1, 2, 3, and 4. as it affects NigE treatment of the four English rules espoused above.

An autosegmental analysis of /ɪ/-insertion rule in POSS nouns

We take the first output form [rəʊzɪz] in 'Rose's purse' in Table 1, which is derived from the inflected/abstract form /rəʊzz/ for non-linear analysis in (3a &b), as follows:

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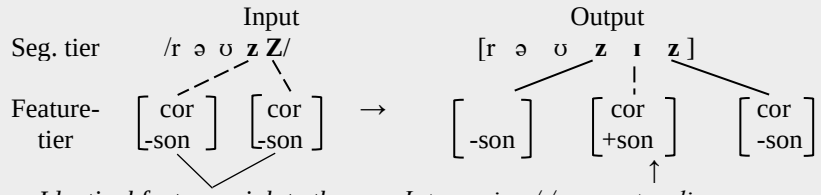
(3) a. ***…Rose's purse***

i.	Input	/rəʊzZ/	Inflectional suffix, /Z/ occurring after coronal sibilant results in input violation of the OCP in POSS formation
ii.		rəʊz# #Z	Adjacency of two coronals, /z/~/Z/ results, which violates the OCP (see the statement in (1), Section 2).
iii.		rəʊz#ɪ#Z	/ɪ/ is introduced between /z/ and /Z/, as OCP-rule trigger (repair strategy) to avoid the OCP violation
iv.	output	[rəʊzɪz]	/ɪ/-insertion satisfies the OCP, where the input /rəʊzZ/ fails to do so.

(3) b.



In (3a, i), the inflectional suffix /Z/ is introduced to form POSS in nouns. The need to establish the English genitive case leads to (3a, ii). This results in the adjacency of /z/ ~ /Z/, which as a consequence incurs a violation of the OCP in (1), Section 2, and the statistic figure, 49.6% in Table 1). Because the OCP must be satisfied, /ɪ/ is therefore inserted between the two coronal consonants, as shown in (3a, iii & iv), and confirmed by the statistics, 50.4% in Table 1.

Relating to autosegmental association lines cum feature specifications, the rule inserting the inherent feature [+son] for the high front vowel is laid bare. Observe in (3b), the duplicated feature [(cor)onal, -(son)orant] links /zZ/ by broken association lines, a reflection of the derivation in (3a, i & ii). To avoid similarity of feature(s), the intervening contrasting feature [+son] surfaces between the coronals, mirrored in the rule in (3a iii & iv). Here, the autosegmental treatment of /Z/ inflection after another coronal in (3b) enables a more transparent account of the English POSS rule operation triggered by the OCP, basically to satisfy the statement in (1), Section 2.

Yod rule

In Table 2 and Figure 2, five examples illustrate overapplication of the SBrE Yod, confirmed by the statistical figure 69.2% as against 30.8%. In (4a) and (4b), we analyse the first example */ʧju:/ 'chew', in which /j/ is introduced after palatals in NigE and thus violates the OCP.

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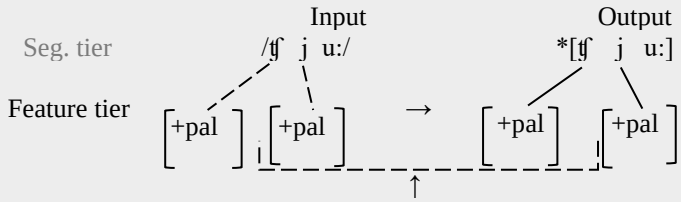
(4) a.			***…had to chew***
i.	L1 Input	/ʧu:/	Yod dropping (as in native SBrE) satisfied the OCP
ii.	L2 Input	*/ʧju:/	Yod insertion/overapplication
iii.		*ʧ#ju:	Adjacency of two palatal consonants, /ʧ/~/j/ violates the OCP (see also the statement in (1), Section 2).
iv.	L2 Output	*[ʧju:]	Inserting palatal, /j/ after another palatal consonant, /ʧ/ violates the OCP

(4) b.



A feature must not be a copy of itself, otherwise the OCP is violated. The Output form with the same feature violates this constraint

As (4a, ii-iv) indicates, (including the other forms in Table 2), /j/ is introduced after a palatal, /ʧ/, a pattern that appears to be intractable in the L2 (NigE) phonology. The introduction of the glide inherently specified with the feature [(pal)atal] becomes a copy of [+pal] also specified for /ʧ/ (or /ʤ/ and /ʃ/ as the case may be), a scenario that incurs the OCP violation. Our assumption of featural violation of the OCP here is hinged on the fact that the feature [+pal] is a copy of itself.

Autosegmentally, the featural duplication [+pal]-[+pal] incurring OCP violation is demonstrated in (4b). Here the association lines show the adjacency problem. This explains why */ʧju:/ is ill-formed, and violates the OCP but the native /ʧu:/ is not. Yod insertion after palatals is indeed one of the canonical transfer features in NigE. It is interesting here to find two Englishes (native vs. non-native Englishes) applying the same rule differently. Both the domesticated pattern and the native pattern are captured statistically in Table 2, 30.8%, as against 69.2%.

Geminate stress resolution

The observance of SRR rule, which repairs a clash of adjacent strong stresses, demonstrated in Tables 3 is analysed non-linearly, using the grid model in (5). In (5), we take the form in Table 3, (1) ‘thirteen men’ as a case study:

(5) a.			***…thirˈteen ˈmen***
i.	Input	/θɜ:ˈti:n ˈmen/	A clash of two strong stresses created input violation of the OCP

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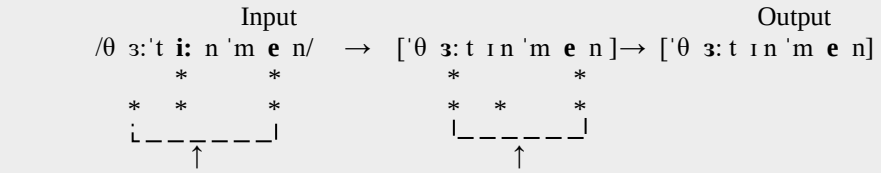
ii.		ˈθɜːtɪn ˈmen	Strong stress on *teen* is shifted leftward to avoid the potential clash with that on *men*
iii.	Output	[ˈθɜːtɪn ˈmen]	The leftward stress shift satisfies the OCP

(5) b.



Two adjacent parallel grid marks indicates stress clash/OCP violation

Stress shift to the left satisfies the OCP. Thus, violation of the OCP is avoided

The violation of the SRR in (5a, i) is clear: in the input, two strong stresses inevitably clash due to the concatenation of *thirteen* and *men*. Following Prince (1983) and Goldsmith (1990), the insight of metrical Grid in (5b) helps our understanding of the native implementation of output 'geminate stress resolution', a term Yip (1988) adopted to describe what Prince refers to as 'stress clash' or 'clash avoidance'. Regardless of either terminology, the mechanism of the autosegmental theory and the OCP is invoked here to insightfully capture the surface SRR, as (5b) demonstrates.

In NigE, the rule is not productive, given the 98.8% figure representing non-observance of the rule. Understandably, the nonproductivity of stress clash avoidance is hinged on the fact that the NigE rhythm is syllable-/tone-timed, unlike English whose rhythm is stressed-timed rhythm (Gut 2002; Udofot 2007, 2011, 2020; Akinjobi 2004). Below we analyse the last of the four OCP-related phenomena explored in this study.

Heteromorphemic geminate consonants and the fusion rule

The ten constructions in Table 4 exhibit fusion of adjacent identical juncture consonants, which we label here as 'heteromorphemic geminate consonants.' As Table 4 indicates, we find that the first of the two juncture consonants absorbed into the second one. We assume here the curious 'absorption' is meant to satisfy the empirical content of the OCP, as (6a) and (6b) reveal. The transformational process is shown below:

(6) a. ***…good day***

Input	/ˈgʊdˈdeɪ/	Input formation of heteromorphemic consonants
	ˈgʊdˈdeɪ	Adjacency of identical consonants, /d/~/d/ creates input violation of the OCP (see the statement in (1), Section 2).
Output	[ˌgʊˈdeɪ]	Fusion rule is forced by the OCP, merging [+cons] ~ [+cons] into one feature [+cons] to satisfy it.

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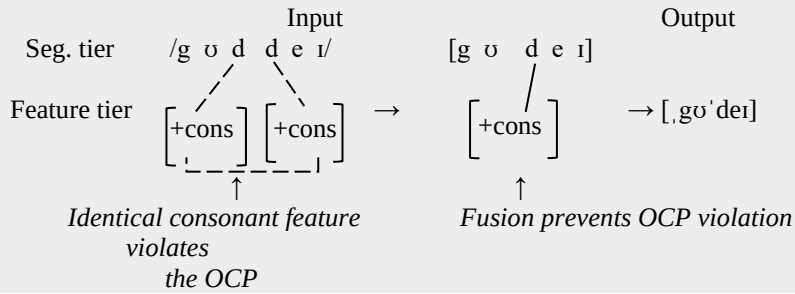
(6)
b.



In (6a), input /C#C/ is reduced to [C] on the surface. The fusion rule is transparently captured in (6b), where one of the adjacent identical features is absorbed into the other (see 6b, second column). A fusion rule such as this is only expected in heterogeminate consonants. This explains why fusion is not expected to occur in the form /bɪg fɪʃ/ 'big fish', since /g/ and /f/ are not geminate consonants. It is fascinating to discover that the native heterogemination consonant rule stands as the only rule in the L2 phonology that recorded a 100% of native accent/pronunciation. However, we adopt the OT to help understand why NigE application of the first three rules does not strictly folow the native norm.

Analysis – A comparative OT analysis of Standard SBrE and NigE pronunciation

In this Section, we adopt the theoretical paradigms of Optimality Theory (OT) (Prince and Smolensky) and (Kager1999) to account for, particularly, the non-native/deviant pronunciation in NigE. The theoretical machinery of the OT, which recognises the interaction between conflicting constraints in language, or among languages, is adequate to capture the phonological variation exemplified in Sections 5.1 and 5.2. For simplicity of analysis, we adopt fewer constraints to capture the peculiar patterns attested in SBrE and NigE accents.

An OT treatment of /ɪ/-insertion in POSS noun
An OT treatment of /ɪ/-insertion in POSS** noun **in SBrE

In OT, taking the first examples /rəʊzɪz/ *'Rose's* in Table 1, (1), constraint ranking for the Control's and the 50.4% Participants' insertion of /ɪ/ between coronals in genitive case would look like the tableau in (7). It should be noted that the constraints: *No [i]* and *No POSS [z]* are markedness constraints disallowing /ɪ/-insertion, and POSS marker /z/ in non-native pronunciation. Also, it should be noted that the hierarchically ranked

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constraints in (7) and (8) would account for all the genitive forms describe in Table 1)). (Note [F] stands for 'feature'.

/ɪ/-insertion rule in POSS Noun: Constraints ranking in SBrE

(7)	/rəʊzɪz/ cor cor	OCP	IDENT-IO[F]	No [ɪ]	No POSS [z]
a.	[rəʊz] cor		*!		
b.	[rəʊs] cor		*!		
c. ➡	[rəʊzɪz] cor cor			*	*
d.	[rəʊzz] cor cor	*!	*		*

In (7), candidate (c) is the optimal form, indicated by a pointing arrow. This is so because it reflects the Control (native) pronunciation and the NigE (Participants') 50.4% observance of the rule that inserts /ɪ/ between successive coronal consonants, /zZ/, having satisfied the first two higher-ranked constraints, OCP and IDENT-IO[F]. Though candidates (a) and (b) do satisfy the higher-ranked constraint, OCP, they are ruled out as optimal candidates in that they fail to satisfy the second-ranked constraint, IDENT-IO[F], which requires that every unit in the output must match those in the input. The inconceivable output, candidate (d) is least optimal because it incurs a fatal violation of the higher-ranked constraint, OCP.

An OT treatment of /ɪ/-insertion in POSS noun in NigE

Taking the /rəʊzɪz/ example, an OT account of the participants' 49.6% non-observance of the /ɪ/-insertion rule in the English genitive will look like the tableau in (8), where the specification of constraints is in a reversed order from those posited in Tableau 7, as follows:

Suppression of /ɪ/-insertion rule in POSS nouns: constraints ranking in NigE

(8)	/rəʊzɪz/ cor cor	No POSS [z]	No [ɪ]	IDENT-IO[F]	OCP
a. ➡	[rəʊz] cor			*	
b. ➡	[rəʊs] cor			*	

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c.	[rəʊzɪz] cor cor	*!	*		
d.	[rəʊzz] cor cor		*!	*	*

Note: Candidate (b) reflects the /s/-pronunciation is common with some Yoruba participants. The substitution of /z/ for /s/ is possibly the result of the absence of /z/ in the Yoruba consonant inventory (see Aziza & Utulu 2006).

On the evaluation of the candidates in (8), there are two 'winning' forms, candidates, (a) and (b). The two candidates reflect pronunciation that typifies NigE accent. Clearly, candidate (a) reflects native /z/-pronunciation for the letter <s> in Rose, while candidate (b) reflects non-native /s/-pronunciation for the same letter. The optimality of both candidates is the results of their satisfaction of the undominated No POSS [z] >> No [ɪ]. Significantly, the analysis in (7) and (8) helps our understanding of how universal constraints are ranked differently by different languages on language-specific basis.

An OT treatment of Yod

An OT analysis of Yod avoidance after post-alveolars in native English and overapplication of it via insertion after the class of palatals in NigE is carried out in the next sub-Sections, respectively.

An OT treatment of Yod avoidance after palatals in SBrE

We take the first example in Table 2, /ʧu:/, as a model for analysis here. In English, as we mentioned earlier, yod must only appear after a consonant, provided the consonant is not /j/ or any of these: /Cl/, /Cr/, /ʧ/, /ʤ/ and /ʃ/. In (9), the tableau depicts how constraints are hierarchically ranked for the performance of the Control and the participants (30.8%) on /ʧu:/ (including the other examples in Table 2):

Yod dropping after /ʧ/, OCP violation avoidance rule: SBrE Constraints ranking

(9)	/ʧu:/ +pal	OCP	IDENT-IO[F]	PAL-PALGLIDE
a.	[tu:] -pal		*	*
b.	[ʧu:] ➡ +pal			*
c.	[ʧju:]	*!	*	

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	+pal +pal			

In (9), which reflects native pronunciation, the most harmonic output candidate is represented in (b), which, unlike (a) and (c), meets the structural condition required for Yod suspension after palatals in native English, and in the accent of 30.8% of the NigE participants. However, the non-observance of the rule in NigE is captured in (10) as follows:

An OT treatment of Yod insertion after palatals NigE

An OT account of overapplication of Yod by a significant number of NigE participants, 69.2% is laid bare in Tableau 10, as follows:

Yod insertion after /ʧ/ as OCP violation in NigE: Constraints ranking

(10)	/ʧu:/ | +pal	PAL-PALGLIDE	IDENT-IO[F]	OCP
a.	[tu:] | -pal	*!	*	
b.	[ʧu:] | +pal	*!		
c.	[ʧju:] +pal +pal		*	*

On the evaluation of the candidates in (10), candidate (c) is the winning candidate. It satisfies the higher-ranked constraint, PAL-PALGLIDE (i.e., adjacent palatal consonants must be allowed), which reflects NigE /j/-insertion rule after palatal consonant. Whereas candidates (a) and (b) are 'losers' in that they incur violations of the higher-ranked constraint. Thus, the differences in ranking in (9) and (10) are the source of variation in applying the Yod rule between the Control, the 30.8% of the participants versus the 69.2% of the participants.

Geminate stress avoidance in OT

The OT accounts for the SBrE stress/rhythm rule in Table 3, which characteristically retracts one of two adjacent input strong stresses to the left in avoidance of a clash with the one flanked at its right, but is overly not observed in NigE accent.

Geminate stress avoidance in SBrE: An OT analysis

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By the native application of geminate stress (stress clash) avoidance rule in SBrE, an OT analysis will look like the Tableau in (11), taking the example, 'thirteen men' (1) in Table 3 as a case study.

Geminate stress avoidance: SBrE constraints ranking

(11)	/θ ɜːˈt iː n ˈm **e** n/ * * * * *	*CLASH	OCP	IDENT-IO(Stress)
a. ➡	[ˈθ ɜːt iː n ˈm **e** n] * * * * *			*
b.	[θ ɜːˈt iː n ˈm **e** n] * * * * * *	*!	**	*
c.	[θ ɜːˈt iː n ˈm **e** n] * * * * *	*!	**	

Note: To guide against bias, we have used the functionally synonymous constraints, *CLASH and OCP here, following Kager (1999) and Yip (1988). This is because both constraints are conditions militating against adjacent identical phonological materials, though the former constraint has been restrictedly used for metrical phenomena, such as stress in the literature.

In 11, candidate (a) is the most harmonic form of the three, satisfying two higher constraints, *CLASH and OCP. The two constraints require that two strong stresses must not be adjacent to each other. Unfortunately, candidates (b) and (c) fail to obey the constraints, thereby ruling them out as the optimal forms.

Non-application of geminate stress avoidance in NigE: An OT analysis

Geminate stress avoidance is rarely observed in NigE (see 1.2% indication of NigE application of the rule in Table 2). A reflection of the non-observance of the rule in NigE (98.8%) is brought to the fore in (12) as follows:

Geminate stress violation: NigE constraints ranking

(12)	/θ ɜːˈt iː n ˈm **e** n/ * * * * *	IDENT-IO(Stress)	OCP	*CLASH
a.	[ˈθ ɜːt iː n ˈm **e** n] * * * * *	*!		
b.	[θ ɜːˈt iː n ˈm **e** n] * * * * * *	*!	*	*

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c. ➡	[θ ɜːˈt iː n ˈm **e** n] * * * *		*	*

As (12) indicates, the most harmonic candidate is (c) whose stress assignment pattern corresponds with that in the source (SBrE) input. The domesticated harmonic candidate is accorded its status due to the hierarchical ranking of the correspondence/faithfulness constraint, IDENT-IO(Stress). The faithfulness constraint dominates the two lower-ranked constraints, OCP and *CLASH. The latter two constraints functionally prevent adjacency and repetition (or clash) issues which satisfy the OCP, but yet are lowly-ranked in NigE.

An OT account of heteromorphemic geminate consonants

The OCP effect in the SBrE phonology is very pervasive on heterogeminate consonants. The constraint-based paradigm of OT captures how the phenomenon is handled in a constraint-interaction framework in (13), taking the first surface form, [ˌgʊˈdeɪ] 'good day' in Table 4, as follows:

Constraints ranking for heteromorphemic geminate consonants in SBrE and NigE

(13)	/ˈgʊdˈdeɪ/ +cons +cons	OCP	IDENT-IO[F]
a.	[ˌgʊdˈdeɪ] +cons +cons	*!	
b. ➡	[ˌgʊˈdeɪ] +cons		*

In (13), candidate (a) is ruled out by the OCP for failing to fuse two adjacent identical features. The failure thus accords candidate (b) the winning status, since it is specified with only one feature [+cons], unlike in the case of candidate (a) whereby the feature is duplicated. The OCP-triggered fusion attested in the phonologies of SBrE and NigE to resolve the featural duplication problem is a natural, 'zero pause' process instigated by the need to facilitate speech production. However, featural fusion of this sort may blur the auditory perception of discrete units across morphological/syntactic strings, especially on the part of foreign listeners coming across the English language for the first time.

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Conclusion

Based on the findings of previous studies, native grammars show quite clearly that the OCP can be pervasive on representations with duplication/repetition of elements within a given tier. Thus, the native languages typically eliminate such 'illicit' (adjacent identical) elements/structures by triggering or blocking rules. However, it has been shown that some languages do not strictly obey the OCP, which gave rise to the assumption the OCP is merely a 'soft', violable constraint (Goldsmith 1976; Odden 1988, 1995, 2013; Boersma 1998; Frisch et al. 2004).

In comparing the state of affairs of the OCP effects in the superstrate (SBrE) system versus the substrate (NigE) system, as we have done in this study, the result shows the OCP is potentially inviolable, and as well as violable. The former seems to be true for the OCP-bound L1 structures adopted in this work, in which SBrE functions as the superstrate language. In the same vein, the second stance does appear to be true, especially when the degree of enforcement of the OCP is not sufficiently at the optimal level, considering critically the phenomenon of 'foreign accent', and constraint ranking in substrate language, in this case, NigE. The established contrast in statistical values between NigE near-native pronunciation (56.5%) and NigE non-native pronunciation (43.5%), together with the hierarchical ranking of constraints, seems to justify the two positions in this study.

Crucially, given the results of the current study, which reflect a 'loose' observance of the OCP in L2 phonology, the findings apparently invoke Odden's (1995:464) assertion that, "[…] languages retain the option of doing nothing about OCP violations''. The incomplete adherence to the OCP in three of the four phonological phenomena tested in the present NigE data could largely be determined by two factors. First, the complex nature of sequential combinations of identical gestures (or features). Second, the level of competence the NigE speakers have attained in the mastery of the SBrE phonological grammar during the acquisition process. In other words, whether OCP-based native/SBrE rules are observed moderately, inordinately or generally in L2 usage depends upon (i) structure-specific SBrE phonological rules, and (ii) speakers' level of competence[1] in English usage.

Crucially, one significant contribution of this study to the body of knowledge, as our data have demonstrated, is that the OCP, acting as a 'soft' condition on representations of similarity or duplication of structures in L2 phonology, is not exclusive to native grammars.

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List of OT constraints employed in this study

OCP	A feature (or segment) must not be a copy of itself
IDENT-IO[F]	The specification for **feature** of an input segment must be preserved in its output correspondent
IDENT-IO(Stress)	The specification for **stress** of an input syllable must be preserved in its output correspondent
No [ɪ]	/ɪ/ is not allowed between two coronal sibilants
No POSS	POSS marker /z/ is not allowed
PAL-PALGLIDE	Palatal consonant must be followed by palatal glide
*CLASH	No stressed syllables are adjacent

NB: To explain the conflict between SBrE and NigE grammars, we propose the markedness constraints, No [ɪ], No POSS, and PAL-PALGLIDE in this study to capture the peculiarities in the phonologies of the two Englishes.

Appendix

Simple sentences (data) administered to fifty educated Nigerian speakers of English (Note items tested are put in bold print).

Passage 1 – (see Table 1)

1. This is **Rose's purse**.
2. They are **fishes' nets**.
3. That's my **watch's case**.
4. That's **Charles' belt**.
5. Emeka attends St. **George's** Cathedral Church.

Passage 2 – (see Table 2)

1. The nut is hard to **chew**.
2. He's a **Jew** by birth.
3. I will love to take some **juice**.
4. It's an **issue** we need to resolve.
5. Please, can I have a role of **tissues**?

Passage 3 – (see Table 3)

1. This row is reserved for **thirteen men**.
2. I like watching **cartoon network** channel.
3. These shells look like **chimpanzee toes**.
4. The matter is **between John** and Mary.
5. **She speaks English** fluently.

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Passage 4 – (see Table 4)

1. **Good day**, Madam.
2. A **red deer** with brown fur.
3. It is a **big game**.
4. The red object is called **traffic cone**.
5. They are **top brass** in the military.
6. It is a **flat tyre**.
7. It is a **classic car**.
8. I need a **back copy** of the magazine.
9. It's one of the biggest **tourist traps** at the country side.
10. The tree typically grows **simple l**eaf.