CONSONANT CLUSTERS IN THE SPOKEN ENGLISH OF EREI-ENGLISH BILINGUALS

Edadi Ilem Ukam, PhD
Department of English and Literary Studies
University of Nigeria, Nsukka
ukamedadiilem@gmail.com

&

Goodluck C. Kadiri, PhD
Department of English and Literary Studies
University of Nigeria, Nsukka
Corresponding email: goodluck.kadiri@unn.edu.ng

Abstract
The ability to articulate consonants in clusters enhances communicative intelligibility, but much linguistic attention has not been paid to them, especially in a second language (L2) situation. Previous studies (e.g. Lo, 2001; Gut, 2007; Chen, 2011; Rungruang, 2017) mainly focused on either the onset or coda clusters in an attempt to show the problems faced by L2 learners' production. The current study investigates the handling of onset and coda consonant clusters in the speech of Erei-English speakers. Chest pulse and sonority theories were adopted as theoretical frameworks, while ten subjects and 17 tokens were selected for the study. The tokens were read aloud by the subjects, recorded, saved and subjected to Praat for analysis. The findings reveal that Erei-English speakers used two strategies to modify and simplify the production of English consonant clusters: consonant deletion and vowel insertion. The subjects found it difficult to produce two or more consonants in succession at both onset and coda positions. They not only deleted any consonant in a cluster, they also inserted a vowel(s) in-between a cluster to simplify it; a rehash of their Erei mother tongue. The study concludes that strong first language influence is the major cause of Erei-English speakers' poor performance of the correct production of consonant clusters.

Keywords: Consonant Clusters, Onset, Coda, Syllable, Erei-English Learners

1.1 Introduction

Even though some authorities do not consider the syllable to be a relevant phonological entity (Chomsky & Halle, 1968; Gimson, 1980; Blevins, 2003), the concept has gained much ground in the field of phonology, essentially because the syllable marks the end of segmental features and the beginning of the suprasegmental features (Ukam, 2015, 2020; Ukam, Uwen & Omale, 2017). In fact, without the study of the syllable, the field of suprasegmental phonology will not be fully and meaningfully discussed. This means that the syllable is not only significant to the study of the segmental features; it is also a very vital tool to the study of the suprasegmental (i.e. nonsegmental or prosodic) features. It is on that basis that Gibson, Pisk, Osser and Hammond (1976) define the concept as a critical unit of language for its production and perception studied through graphemes, phones and phonemes. And Jones (1962) makes it clear that the syllable is "a phonological prime" (p. 121). But studying the term and its features is a big task, especially among second language (L2) and foreign language users because there are some constraints and permissible parameters required. The production of consonant clusters is one of such syllabic features that present difficulty to L2 learners. Different languages represent their syllable structures using different syllable phonotactics and restrictions. While some languages (like most Nigerian languages) allow simple, restricted, unmarked syllable structure, or never have consonant combinations or clusters at both beginning and end of words, others (like English), for example, allow very complex, marked or consonant clusters between three and four at the margins. Other languages may not have as many consonant clusters as English, while some languages (e.g. Slovak) have even more consonant clusters than English (Gregova, 2010).

English allows combination of up to three consonants at the onset and four at the coda expressed as (C^{0-3}) V (C^{0-4}). Lo (2001) puts the number of permissible consonant clusters in English at about 462, while Gregova (2010) roughly puts the same number at about 166. This means that about 40 per cent of English words are likely to contain clusters ranging from two to four. In other words, consonant clusters are very important elements in word building in English. Their presence may create new words from existing words: word pairs like 'seem' and 'seemed'; 'pit' and 'spit'; 'well' and 'dwell'; 'food' and 'flood'; 'girl' and 'girls'; 'lay', 'play' and 'splay', among others, are instances where the second or third word in each pair containing consonant clusters has helped in the creation of new words.

Inability to produce appropriately the consonant clusters in one's spoken English, might likely result in the articulation of different words from the ones the speakers intended, since their presence in a word may change the word to another. If, for instance, an L2 speaker intends to pronounce the word 'spit' but ends up producing 'pit' following the syllable nature of his first language (L1), which does not permit two or more consonants in succession, the speaker is likely to produce a sound that generates or conveys a different meaning from that intended, and the listeners may find it difficult to understand. This is problematic to most L2 speakers as they may be unable to produce consonant clusters smoothly (Lo, 2001). Instead, they may insert an extra vowel in-between a cluster or they will skip or delete one or more consonants in a cluster. Second language learners and/or speakers will have pronunciation problems with the consonant clusters that do not match the pronunciation system of their L1, especially when their L1 has relatively few consonant clusters, or does not contain consonant clusters at all.

Lo (2001) notes that French speakers of English, for example, hardly see group of three or more consonant clusters, concluding that vowels like / ə, ɪ / are usually introduced as soon as there is a risk of gathering three or more consonants. And Yoshida (2012), in support of Lo, states that "students whose languages have different syllable structure rules than English may have trouble pronouncing some English words" (p. 11). Although the source further maintains that L2 speakers will find it difficult to cope with English clusters, coda clusters specifically are often more problematic than those of onset. Second language learners will unconsciously continue to reproduce these changes following their L1 in order to make words easier to pronounce (Lo, 2001, p. 20), even though it creates comprehension challenges for their listeners.

Nigerian speakers of English, being English language learners (ELLs), also encounter problems in producing English consonant clusters. Onuigbo (1996), for example, has argued that the majority of learners in Nigeria are likely to have difficulty with the complex consonant clusters of English. He maintains that learners may find it relatively easy to pronounce the word 'pit', for example, which contains no cluster. But the same learners will find it difficult to pronounce 'spit' or 'split', both of which contain two and three clusters at the onset, respectively. And Ukam (2015) has maintained that Erei language (a Benue-Congo language family of the Western subgroup of the Upper Cross River which in turn is a subgroup of the Delta Cross in the Niger-Congo family (Essien, 2003; Udoh, 2003; Inya, 2011; Ugot, 2013, Ukam, 2015; Uwen, 2018 and spoken by over 25,000 people in Biase Local Government Area of Cross River State in Nigeria) has a simple structure of V, VC, CV and CVC, and the onset and coda are made up of only one consonant. According to Ukam, "consonant clusters... are non-existent [in Erei].... This is one of the reasons why at times some Erei-English bilinguals insert vowels between the consonant clusters of English in order to fit in or obey Erei syllabic structure" (p. 63). As a result, Erei speakers, who use English as L2 like many Nigerians, are likely to find it difficult to produce consonant clusters correctly.

Some previous works (e.g. Lo, 2001; Gut, 2007; Gregova, 2010; Yuliati, 2014) on consonant clusters have been carried out on L2 speakers. Although studies have focused attention mainly on either onset or coda clusters, very little attention has been paid to both in a single study. Also, in spite of the amount of research carried out, the issue of consonant clusters in the speech of Erei-English speakers has not been adequate. Yet, these speakers use English as L2 as well as communicating with other speakers of English. Given that Erei syllable structure is different from that of English, there is bound to be variation in the speech of Erei-English bilinguals when producing consonant clusters.

Theories (such as error analysis, contrastive analysis, optimality theory, etc.) have been adopted to account for consonant clusters as produced by L2 speakers of English. But, not so much

has been done to account for the number of syllables in a word, especially as a result of consonant clusters, considering the fact that the addition of a vowel in-between a cluster can generate additional chest pulse. The present study, therefore, investigates the production of English consonant clusters in the speech outputs of Erei-English speakers, using chest pulse and sonority theories to account for their performance. The paper sets out to investigate the Erei-English learners' production of English onset and coda consonant clusters in isolation, and to examine the effects of miscue in consonant clusters in isolated English words. The following questions would be addressed; To what extent do Erei-English learners apply appropriately English consonant onset and coda clusters in isolated words?What are the effects of non- or inappropriate application of isolated consonant clusters among Erei-English language learners?

2.1 Review of concepts

2.1.1 Consonant clusters

Consonant clusters refer to the sequences or combinations of consonants found at the beginning or end of words and syllables (Lo, 2001; Catford, 1988). While Crystal (1991) avers that consonant clusters are those sequences of adjacent sounds occurring in restricted patterns at the beginning or end of syllable, Roach (2009) simply describes consonants clusters as occurrences "when we have two or more consonants together...." (p. 27). Roach (2009), therefore, groups consonant clusters at both onset and coda positions differently. To him, the initial three-consonant clusters (e.g. spring), for example, can be classified as pre-initial (e.g. /s/), initial (e.g. /p/) and post-initial (e.g. /r/), although he argues that only /s/, which is in initial cluster, whether in two- or three-consonant clusters, can be regarded as pre-initial. The author also groups coda clusters (e.g. prompts) into four different segments: pre-final (e.g. /m/), final (e.g. /p/), post-final 1 (e.g. /t/) and post-final 2 (e.g. /s/). Roach even goes further to explain that some English words (like 'sixths') may not have pre-final, but have post-finals 1, 2 and 3.

However, these groupings are somewhat difficult and complex, especially to ELLs. Instead, what should be the most important consideration is that in addition to accepting three-consonant clusters at the beginning of a word, English also accepts as many as four at the end of a word, all of which are pronounced in succession without dropping anyone of them.

2.2 Previous studies on consonant clusters

A number of scholars (e.g. Uzoezie, 1992; Eka, 1996; Onuigbo, 1996; Cruttenden, 2001; Lo, 2001; Roach, 2009; Gregova, 2010; Rungruang, 2017; Ukam, 2020) have conducted studies on English consonant clusters not only on onsets, but also on codas.

Lo (2001), for instance, investigated consonant clusters in spoken English of Wolof speakers, using 50 participants and a structured questionnaire as well as employing error analysis as the theoretical framework in order to show the errors related to the production of consonant clusters in isolated words in reading passage and in free speech. Using diagrams to show the frequency of the errors according to the type of consonant clusters, the findings of the research showed that more than 70 per cent of the participants "had serious problems because they could not pronounce satisfactorily the consonant clusters, especially group of three and four consonant clusters" (p. 36). The findings further reveal that errors are consistently observed in vowel intrusion or consonant reduction, and that English native speakers may hardly understand Wolof speakers in their deployment of consonant clusters. The author concluded that pronunciation problem should be directed at articulatory phonetics in particular, and to the English sounds in general, suggesting that the teaching of consonant clusters should be a practical exercise.

Rungruang (2017) conducted a study on speakers whose L1 do not have consonant clusters at both onset and coda positions. His attention was on Thai speakers who learn English as a foreign language, using Markedness Differential Hypothesis (MDH) by Eckman (1977) as the theoretical model. He selected 34 participants aged 20-21 as the sampling population and a native American speaker. He collected 160 tokens – 40 onsets and 120 codas. The participants were administered Likert scale questionnaires on the selected tokens to test participants' listening and speaking skills. The findings show that the respondents had more difficulty in acquiring more marked clusters (three- or four-member clusters) than less marked one (two-member clusters). Second, the participants made more changes in the more marked clusters than the less marked ones; and thirdly, the respondents employed consonant deletion or a vowel insertion as repair strategies to modify English clusters to fit

their L1 inventory. He noted that the participants did well in onset clusters than in coda clusters, both in the pre-test and post-test exercises. He concluded that the theory worked well in coda clusters than in onset clusters, and that the participants were rated high in the marked tokens than unmarked tokens due to familiarity with the tokens selected (Rungruang, 2017, p. 225).

Gregova (2010), who compared English consonant clusters with those of Slovak, contended that English has about 55 two-consonant clusters at onset position and 55 at coda position, making a total of 110 two-consonant clusters. The source reported that at the level of three-consonant position, the total number for onset were nine, while those of coda were 40 which usually end with the following morphemes /s, z, t, d, θ/. When combined together, three-consonant clusters recognised in English were 49, whereas four-consonant clusters were only seven (7). For Slovak, the source had 139 two-consonant clusters, 85 three-consonant clusters (both of which outnumbered those of English) and seven four-consonant clusters, corresponding with those of English. The study concluded that word-initial and word-final consonant clusters showed that frequency, combination and distribution possibilities of the Slovak phonemes were higher than those of English. And that English consonant clusters could be accounted for by morphology unlike Slovak, which were not morphologically motivated.

Chen (2011) investigated nine Taiwanese students using tokens selected from onsets only. Using both MDH and Interlanguage Structure Conformity Hypothesis to account for the changes involved in the testees' utterances, the findings show that since consonant clusters were non-existent in Chinese phonological inventory, the respondents had difficulty in more marked structure (i.e. three-member clusters) than in less marked structure (i.e. two-member clusters). The respondents instead employed consonant deletion and extra vowel insertion as repair strategies in order to modify the foreign sounds to fit their L1 inventory.

While Chen (2011) studied onset clusters, Yuliati (2014) investigated codas, without any attention paid to onsets to show how Bahasa Indonesian speakers of English constantly deleted plural, third person and past tense form morphemes in clusters. Although the author did not introduce a theoretical model to show why Indonesian-English speakers prefer one strategy to another, the study further reveals that Indonesian speakers of English did better in the production of more than two consonants in a row. Nevertheless, they usually devoiced final consonant clusters, replacing them with voiceless sounds: they replaced clusters ending with voiced consonants such as /b, g/ with their voiceless counterparts /p, k/. Also, while obstruent consonants disappear to the most devoicing ones, consonant deletion is another repair strategy employed by Indonesian speakers in their spoken English.

The empirical studies reviewed reflect the idea that English consonant clusters pose some pronunciation difficulty for L2 learners. To account for the causes and to make a prediction of the difficulties, many theories have been deployed by researchers, namely MDH, interlanguage structure conformity hypothesis, optimality theory, sonority sequencing principle, error analysis and contrastive hypothesis, among other theories. However, sonority and chest pulse theories have not been adequately deployed as models for accounting consonant clusters. The present study, therefore, employs both theories as theoretical models to account for Erei-English learners' production of English consonant clusters.

3.1 Methodology

3.1.1 Data

Ten Erei-English participants were purposely selected. The respondents have completed senior secondary school, and are in preparation to higher institution within the age bracket of 18 to 20 years. The respondents were selected because it was expected that they will read English words successfully without much difficulty.

Seventeen words containing onset and coda clusters were selected for the analysis; all words or tokens were randomly selected from previous studies (e.g. Onuigbo, 1996; Lo, 2001; Chen, 2011; Ukam, 2020). They were divided into two groups: onset clusters and coda clusters. Seven tokens were selected from English onset clusters, and they were further divided into two sub-groups: two-number (CC) onset clusters and three-number (CCC) onset clusters. Ten tokens or words were collected from English coda clusters, and they were further divided into three sub-groups: CC-coda clusters, CCC-coda clusters and four-member (CCCC) coda clusters (see Table 1 and Figure 1). The researchers

recorded, saved and subjected the tokens to Praat, a computerised linguistic speech analysis. The recording was done in a manner that the respondents were not influenced in any way.

Table 1: Classification of words or tokens collected for the study

Onset clusters				**Coda clusters**		
	Word	**Cluster**		**Word**	**Cluster**	
1.	‘blue’	bl-	CC	8. ‘eighth’	-tθ	CC
2.	‘new’	nj-	CC	9. ‘seemed’	-md	CC
3.	‘dwell’	dw-	CC	10. ‘backed’	-kt	CC
4.	‘bottle’	-tl	CC	11. ‘tests’	-sts	CCC
5.	‘square’	skw-	CCC	12. ‘mostly’	-stl	CCC
6.	‘splay’	spl-	CCC	13. ‘country’	-ntr	CCC
7.	‘strong’	str-	CCC	14. ‘prompts’	-mpts	CCCC
				15. ‘sixths’	-skθs	CCCC
				16. ‘glimpsed’	-mpst	CCCC
				17. ‘thousandths’	-ndθs	CCCC

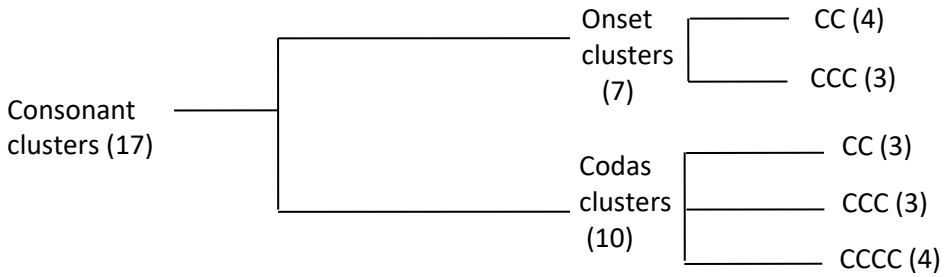

Figure 1: Grouping of consonant clusters (onset and coda clusters) selected for the study

3.1.2 Theoretical models

Two theories – chest pulse theory and sonority theory (or sonority sequencing principle) – were used for the study.

3.1.2.1 Chest pulse theory

Chest pulse theory, also known as expiratory theory or pulse of air pressure, was propounded by a psychologist, Stetson (1951). The theory emphasises that each syllable is marked by a burst of air called chest pulse. Each syllable corresponds to one expiration or chest pulse; two chest pulses equal two syllables, three chest pulses equal three syllables, and so on. In other words, one chest pulse must be assigned to one syllable, and a new expiration determines the syllable boundary of a word (Gimson, 1980, p. 56). Therefore, the number of chest pulses equals the number of syllables in a word.

However, as important as the chest pulse theory is, in discussing syllable, it is heavily criticised. According to Ladefoged (1967), although the theory can help to determine syllable boundary, there is certainly insufficient basis for pulse of air pressure of the syllable in normal speech, because it cannot account for cases when two vowels occur together or one after another in a syllable. For instance, Gimson (1980) argues that it is doubtful whether a double chest pulses can be evident in a word like ‘seeing’ /siːɪŋ/. While the theory will classify the word as having one syllable only, in reality, the word contains two syllables. But no matter the shortcomings of the theory, it is still very relevant in the study of the syllable structure, and will also be important in analysing the data for the present study.

3.1.2.2 Sonority theory

The theory is also known as prominence theory. It was first formulated by Sievers (1876) and later modified by Jespersen (1904) to explain instances and tendencies of how some segments are more

sonorous than others within a syllable. Sonority is mainly on the auditory judgment and/or perceptibility. Unlike the chest pulse theory, the pulses of pulmonic airstream in speech production correspond to peaks of sonority. The sonority of a speech sound is discussed as "its relative loudness compared to other sounds" (Giegerich, 1992, p. 132), and each syllable corresponds to a peak in the flow rate of pulmonic air. Sonority theory states that the number of syllables in a word is determined by the number of peaks of prominence. This means that the notion of sonority is very important when discussing syllable, because it is a property that ranks segments in a syllable hierarchically from most sonorous sound to the least one. Speech sounds, therefore, can be ranked based on their intrinsic sonority according to sonority scale: voiced sounds are more sonorous than voiceless ones; sonorants are more sonorous than obstruents; vowel sounds are moresonorous than consonants and open vowels are more sonorous than closed ones. The order of hierarchy is shown in Figure 2:

The hierarchy in Figure 2 shows that the most sonorous segments tend to form the peak in a syllable: vowels, therefore, are the most sonorous sounds; the number of vowels or peaks is associated to the number of syllables. One peak equals one syllable; two peaks equal two syllables; three peaks equal three syllables, and so on. However, in the absence of a vowel in a syllable, syllabic consonants (liquid or nasals) can function as the peaks, especially when surrounded by other consonants.

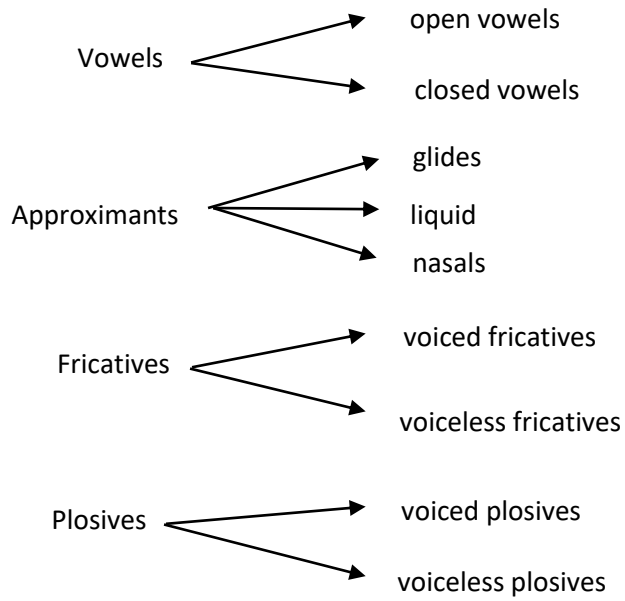

Figure 2: The ranking of phonemes in terms of their sonority hierarchy

< The theory, like chest pulse, also has its own limitations. First, it cannot predict the number of syllable boundaries; or simply, it does not account much in discussing syllable division. Second, it does not tell how many phonemes a syllable may contain. And lastly, it cannot tell the type of phonemes that follow each other in a language. Based on the limitations of the two theories, it might not be adequate enough to analyse Erei speakers' utterances in their handling of English consonant clusters using only one theory. Both theories will be meaningful, because when an extra vowel, for instance, is added in-between a cluster, it will form an extra syllable, resulting in more than the required chest pulses.

4.1 Presentation of data

Results of the respondents are presented in Table 2. The table reveals the extent to which Erei speakers of English apply consonant clusters (i.e. onset and coda clusters) in their spoken English. The table further shows the level of consonant deletion and vowel insertion in a cluster by the informants as well as the percentage of poor application of consonant clusters of each word.

Table 2: Production of onset and coda clusters by native Erei speakers of English

Word	**Cluster**	**Consonant deleted**	**Vowel inserted**	**Percentage of wrong production**
Onset clusters				
'blue'	bl-	--	(ʊ)	4(40%)
'new'	nj-	(j)	(ʊ)	5(50%)
'strong'	str-	(t)	(ɪ),(ə)	6(60%)
'square'	skw-	(s)	(ɪ),(ʊ)	7(70%)
'bottle'	-tl	--	(ʊ),(ə)	8(80%)
'splay'	spl-	(s)	(ɪ),(ʊ)	8(80%)
'dwell'	dw-	--	(ɪ),(ʊ)	9(90%)
Coda clusters				
'backed'	-kt	(t)	--	4(40%)
'country'	-ntr	--	(ɪ)	5(50%)
'seemed'	-md	(d)	--	7(70%)
'tests'	-sts	(ts),(s)	--	8(80%)
'mostly'	-stl	--	(ɪ)	8(80%)
'sixths'	-skθs	(kθs),(θs),(s)	--	8(80%)
'eighth'	-tθ	(t),(θ)	--	9(90%)
'glimpsed'	-mpst	(m),(st),(s),(ps),(p)	--	9(90%)
'thousandths'	-ndθs	(dθs),(θs),(θ),(d),(s),(ds)	--	9(90%)
'prompts'	-mpts	(m),(ts),(s),(pt)	--	0(100%)

4.2 Discussion

From the analysis displayed in Table 2, it shows that Erei speakers of English are yet to understand the right production of English consonant clusters when they occur in words. As stated earlier, it is an established fact that English permits up to four consonants in succession without an intervening or intruded vowel, but Erei does not permit consonant clusters whether at the beginning, middle or end of a word (see Inya, 2011; Ukam 2015, for more discussion of Erei syllable structure). As a result, Erei-English bilinguals usually find it difficult to cope with the consonant clusters of English. From the results of the respondents, it was discovered that two major phenomena exist in the production of English consonant clusters by Erei-English speakers: the first is the dropping of any consonant in a cluster, and the second is the addition of an extra intruded vowel in-between a cluster. Both characteristics are employed by respondents to simplify the clusters for easier pronunciation, that is, some elements of the clusters are not pronounced, and the tendency for these learners is simply to delete some consonants or add a vowel: a reflex of the L1 Erei syllabic structure system where consonant clusters are non-existent, and where to every consonant is followed or preceded by a vowel.

The informants produced CC-onset cluster as CVC or CV. In 'blue' (CCV) and 'dwell' (CCVC), one often hears 'bulue' (CVC) and 'duwell' or 'diwell' (CVC), respectively where the vowels /ʊ, ɪ/ have been introduced to break up the cluster. Due to the introduction of intruded sonorous vowels, majority of Erei speakers produce the words with two chest pulses instead. In 'new' (CCV), there is a total deletion of /j/ and introduction of an extra vowel /ʊ/ so that the pronunciation becomes 'nuw' in their spoken English. In 'bottle' (CVCC) where the last consonant serves as a syllabic consonant or peak of prominence, an extra /ʊ/ or /ə/ is introduced to separate both consonants, and therefore, forced the second consonant from functioning as a syllabic consonant to an ordinary consonant. The participants were unable to produce the two consonants at a go. This assertion aligns with the findings of Akindele and Adegbite (1999), who assert that Nigerians usually add extra vowels in-between a consonant and the following syllabic consonant, because they hardly could produce the two at once. Forty per cent (in 'blue'), 50 per cent (in 'new') and 90 per cent (in 'dwell') of the total respondents had a wrong production of the words.

In CCC-onset cluster, there is also both consonant deletion and vowel insertion. There is deletion of initial fricative consonant /s/ in 'square' (CCCV) and 'splay' (CCCV). Both words are produced as CVCCV where an intruded vowel has been added. It is important to note that the deletion

of initial consonant in 'splay' causes the word to form a new word 'play' morphologically, making their pronunciation a miscue. Two different more sonorous sounds /ʊ, ɪ/ are also inserted in-between the first two consonants by native Erei speakers of English so that both words which are produced with one chest pulse are rendered with two chest pulses. Seventy per cent and 80 per cent of the participants produced the words as 'siquare' or 'suquare' (CVCCV) and 'siplay' or 'suplay' (CVCCV), respectively. Only 3(30%) in 'square' and 2(40%) in 'splay' produced the words correctly. In 'strong' (CCCVC), respondents not only dropped the middle consonant /t/ in the cluster, but they also introduced more sonorous sounds /ɪ, ə/ in-between the first two consonants so that like 'square' and 'splay', it is then produced with two chest pulses by the subjects. Although 40 per cent of the respondents had the correct pronunciation of the word, majority of the informant (60%) produced the same word wrongly.

For coda clusters, beginning with CC-coda cluster, we found also consonant deletions, but no vowel intrusion in 'eighth' (CVCC), seemed (CVCC) and 'backed' (CVCC). In 'eighth', the informants produced the word as CVC, thereby deleting either /θ/ or /t/. Although Erei-English speakers found it difficult to produce the two consonants together, they did not delete both at the same time. Also, the English regular past tense marker '-ed', derived as /t/ or /d/, were dropped by the participants in words like 'seemed' and 'backed'. They produced the words as 'seem' (CVC) and 'back' (CVC) without differentiating them from their present tense counterparts. Nine respondents or 90 per cent (in 'eighth'), 7(or 70% in 'seemed') and 4(or 40% in 'backed') could not produce the words correctly. Only few respondents, when put together, articulated the words correctly: 60 per cent produced 'backed' correctly, one per cent produced 'eighth' correctly and three per cent produced 'seemed' correctly.

The words 'tests' (CVCCC), 'mostly' (CVCCCV) and 'country' (CVCCCV) in CCC-coda cluster, the informants dropped some consonants and inserted an intruded /ɪ/ in-between the clusters. Whereas some respondents dropped /ts/ so that the production of 'tests' becomes 'tes' (CVC), others skipped the regular noun plural marker '-s', the last consonant in the word, in order to reduce a CCC-coda cluster to two, and therefore, produced the word as 'test' (CVCC) instead. Eighty per cent of those tested skipped any consonant in the cluster, reducing the number of consonants from three to two or one so that they can produce it without much difficulty. In 'mostly' and 'country', none of the informants dropped a consonant. Instead, they inserted an extra intruded vowel /ɪ/ in each cluster of the words, and the results of their pronunciation become 'mostily' (CVCCVCV) and 'countiry' (CVCCVCV). Both words are, therefore, produced with three chest pulses each, producing three syllables, instead of two. Eighty per cent of the respondents had a poor pronunciation of the words 'tests' and 'mostly', while 50 per cent had the same poor performance on 'country'. Only two testees (20%) pronounced 'tests' and 'mostly' correctly, and five (50%) rendered 'country' correctly.

In CCCC-coda cluster, we experienced a lot of consonant dropping such that any consonant could easily be dropped by participants, although no case of vowel insertion was noticed. In 'prompts' (CVCCCC), for example, some respondents either dropped two consonants in a row /ts, pt/ or one out of them as in /m, s/. In their production, they reduced a CCCC-coda cluster to two, pronouncing 'prompts' as 'promp' or 'proms' (CVCC). Or they reduced the same CCCC-coda cluster to three: they, therefore, articulated the word as 'propts' or 'prompt (CCVCCC) in their spoken English. None of the respondents produced the word correctly.

For 'sixths', respondents skipped any consonant that comes their way in the cluster /skθs/ (CCCC). Some deleted the last three in a row so that the word is produced as 'sik' (CVC) with just one coda. Some also deleted two consonants in a row, while others only deleted one consonant as shown in Table 2. The most to be deleted by the subjects is the noun plural marker '-s', the last consonant in the cluster. Eighty per cent of the respondents did not produce the consonant at all.

'Glimpsed' (CCVCCCC) and 'thousandths' (CVCCCC) had the highest deletion among the tokens tested. In 'glimpsed' some testees deleted the first consonant /m/, the middle two /ps/, the last two /st/ or only /p/ in their production of the word. One often hears 'glipsed' (CCVCCC), 'glimsed' (CCVCCC), 'glimt' (CCVCC) or 'glimp' (CCVCC), among others. Like 'dwell', 'eighth', 'thousandths', 90 per cent of the participants skipped any consonant in the cluster, and therefore, reduced a CCCC-coda cluster to either three or two. Only one testee was able to render the four consonants in succession correctly.

Like 'glimpsed', 'thousandths' (CVCVCCCC) was wrongly produced by majority of the respondents. The fricative and plural marker /s/ was the most frequently deleted, followed by /d/ and finally followed by /θ/. Only the nasal /n/ was not deleted. The deletion reduces a CCCC-coda consonant cluster to either three-number consonants: as in 'thousandth', 'thousanths' or 'thousands' (CVCVCCC); two-number coda consonants as in 'thousand' or thousanth' (CVCVCC); or one-number coda consonant as in 'thousan' (CVCVC), among others. Nine (or 90%) of the participants had a poor performance on the word. Only one participant could manage to produce the four consonants at once.

The performance of Erei-English speakers in their handling of English consonant clusters as shown in Table 2 above and Figure 3 below is relatively very poor due to the influence of Erei language where consonant clusters are not in existence. The subjects have first acquired Erei before learning English. They pronounced words containing consonant clusters following the syllable nature of Erei. However, the subjects tested are yet to understand the fact that two or more consonants in English can be pronounced in a row without dropping any consonant or inserting a vowel between clusters. Table 2, for instance, reveals that, while onset clusters, on the one hand, have less consonant deletions and more vowel intrusions, coda clusters, on the other hand, have less vowel insertions and more consonant droppings.

Figure 3 below is a graphic chart showing the general performance of each token as displayed by Erei-English learners or speakers. The chart reveals that coda consonant clusters were more wrongly pronounced than their onset counterparts. For instance, 'prompts' was wrongly produced by all respondents with 100 per cent of poor performance, followed by 'eighth', 'glimpsed' and 'thousandths': all with 90 per cent of poor performance. Only 'dwell' in onset cluster has the highest poor performance of 90 per cent. 'Tests', 'mostly' 'sixths' (in coda cluster) and 'bottle' (in onset cluster) have 80 per cent of poor articulations. While 'seemed' (in coda cluster) and 'bottle' (in onset cluster) both have 70 per cent of wrong performance, 'strong' containing an onset cluster, has 60 per cent of poor production. Those with the least poor manifestation of consonant clusters in the chart are 'blue' and 'backed' (40%) each, and 'new' and 'country' 50 per cent each.

Figure 3 and Table 2 further show that respondents did well in unmarked cluster (two-number consonant cluster) than marked clusters (three- and four-number consonant clusters). 'Blue', 'backed' and 'new', which contain unmarked clusters received less percentages of

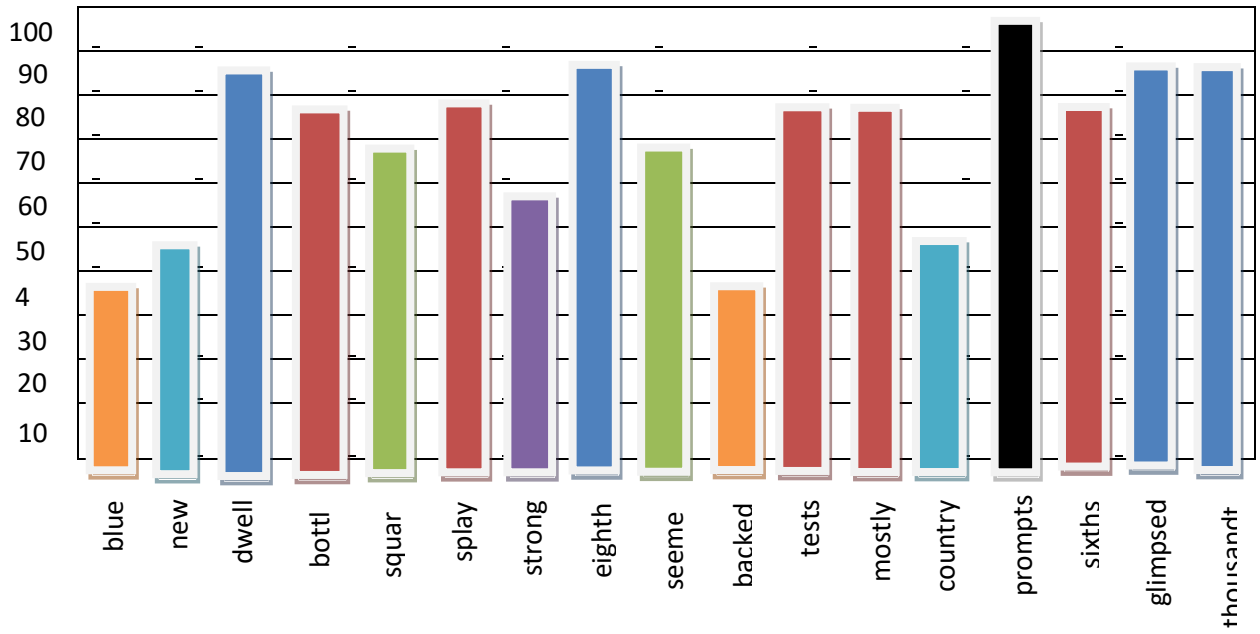

Figure 3: Production of consonant clusters in some selected words by native Erei speakers of Englishpoor articulation. Only 'bottle', 'dwell', 'eighth' and 'seemed', although unmarked, received higher percentages of poor performance, even though the percentages were not as higher as 'prompts', which contains a marked consonant cluster. Respondents also had a very poor display on the following words with marked clusters: 'thousandths', glimpsed', 'mostly', 'test', 'splay'. This observation corroborates with Rungruang (2017), who explains that Thai speakers of English usually find it difficult to articulate marked consonant clusters than less marked ones.

From the results and discussion above, it is believed that consonant clusters are difficult and problematic to handle among Erei learners and speakers of English. The following are found among Erei speakers in their process of pronouncing words containing consonant clusters at both beginning and end of a word:

(1) There is consistent consonant dropping or reduction in a cluster by Erei learners of English. Even though consonant cluster reduction could be observed among native speakers of English, especially the dropping of middle consonants in a cluster, Erei speakers or learners drop any consonant in a cluster. In a three- or four-consonant cluster, they may drop the first, the second, the third or the fourth consonant, irrespective of the order of occurrence. They do not notice the fact that when a consonant is dropped in a cluster, it may sometimes change the morphological meaning of the word, or change the entire word to another. In this study, the most dropped consonants in a cluster were regular past tense and plural noun markers. Learners are unaware of this mechanism, and may, therefore, produce unintelligible words when they drop consonants in clusters.

(2) In the case of Erei-English speakers, vowel intrusion is very frequent in the production of English consonant clusters. This is done in order to simplify or modify cluster(s) following their Erei L1. The participants employed more vowel insertion, especially in the onset clusters. They are, however, not aware of the fact that when an extra vowel is added to a word, an extra syllable has also been added. The respondents always added intruded vowel without noticing the fact that they had generated more numbers of syllables from the norm. This confirmation corroborates the findings of Lo (2001), who states that Wolof speakers of English do not only reduce some certain consonants in a cluster, but they also add extra vowels in order to simplify the cluster to suit the simple syllable nature of Wolof language. The assertion also agrees with the findings of Rungruang (2017), who noted that Thai speakers of English employed two repair strategies: consonant deletion and vowel insertion in order to modify English clusters to fit their L1 inventory.

In responding to Research Question 1, it was observed that Erei learners of English have a poor mastery of English consonant clusters at both onset and coda positions. They do not only insert extra vowels to break up the clusters, they also delete any consonant in order to simplify the cluster. They could delete the first, second, third or fourth depending on the number of consonants in the said cluster. To answer Research Question 2, it was noticed that the poor performance displayed by Erei-English speakers might result to unintelligible utterances whenever they speak. They may utter words that they did not intend to, or they will produce more syllables than necessary in English, which they also did not intend; thus, misleading their listeners.

5.1 Conclusion

The study sets out to determine the competence of Erei-English language learners when dealing with English onset and coda clusters with longer consonant sequences compared to those of Erei which has simple consonant combinations. Because Erei language has a simple syllable structure where consonant clusters do not exist, Erei speakers tend to simplify the clusters by either addition of an extra intruded vowel or dropping of some consonants in clusters, since they find it difficult to produce them in a row. While 52.9 per cent of the tokens have extra vowel(s) inserted in-between the clusters, 47.1 per cent of the tokens showed consonant reduction. The onset clusters received the most intruded vowels, whereas the coda clusters received the most dropped consonants. With these findings, it is important to note that consonant clusters need extra attention in English language instruction among ELLs in addition to constant practice by learners. Teachers need to draw the attention of ELLs to consonant clusters in English to assist learners overcome the difficulty of handling English consonant clusters.

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