THE PRONUNCIATION OF /s/[ii] IN COMPLEX ONSET AND CODA CLUSTERS IN SOMALI-ACCENTED ENGLISH

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The pronunciation of /s/ in complex onset and coda clusters presents a formidable challenge to Somali English Language Learners (ELLs). There are two primary reasons why /s/ contributes to accentedness. First, in English /s/ occurs in a wide array of phonological environments in which it is not permissible in Somali. Secondly, many of the distributional patterns of the English /s/ violate the Sonority Sequencing Principle (SSP) and the Coda Condition, two widely attested constraints in world languages. This study shows that the Somali pronunciation of /s/ becomes less accented the more the speaker learns to violate these two constraints in the same way that native/proficient speakers of English do. Therefore, teachers can help their students produce /s/ successfully if they teach them two simple strategies: an exaggerated elongation of /s/ in complex onset and coda clusters and an exaggerated voicing of <-s> when it is added as a suffix to a voiced segment.

INTRODUCTION

The pronunciation of /s/ in complex onset and coda clusters presents a formidable challenge to Somali English Language Learners (ELLs). Complex onsets are understood in this paper as referring to syllables that contain two or more consecutive consonants before the nucleus. Similarly, complex codas are those that contain a sequence of two or more consonants after the nucleus. Faircloth and Faircloth (1973, p. 57) list /s/ as the fourth most frequent consonant in English, right after /n/, /t/ and /d/. It also occurs more frequently in onset and coda clusters than any other sound. In such environments, its pronunciations vary from [s] to [z] to [əz]. Whitley (2004) also notes that /s/ occurs in 87% of the world's languages. The frequency of /s/ in English and its pervasiveness in world languages can be both a source of positive and negative transfer. The segment /s/ is likely to be transferred positively because it has similar phonetic characteristics across a vast array of languages. However, /s/ can also be subject to interference because languages have various phonotactic constraints that govern its distribution. As a result, it is rare to find two languages where /s/ is pronounced identically in complex onset and coda clusters. This is especially true for the three Somali speakers whose pronunciation is the subject of this study. Because of the phonotactic differences between Somali and English, more often than not, the speakers fail to apply the rules that convert /s/ into [z] in the coda. In other instances, they epenthesize a schwa between complex onset and coda clusters involving /s/. Occasionally, they delete /s/ from complex clusters altogether. Not correctly applying the various rules that govern the pronunciations of the English /s/ often brings about an unmistakable

indexical feature of accentedness to Somali English. *The Sonority Sequencing Principle* and *The Coda Condition* are used in this paper to provide a principled account of this aspect of Somali pronunciation. These phonological principles will be explained later in the paper. The insights gathered from this analysis may lead to pedagogical strategies that teachers can use to help their Somali students improve their production of /s/ in various environments.

COMPARISON BETWEEN ENGLISH AND SOMALI SYLLABLE STRUCTURES

All languages organize phonemic materials into higher units called syllables. The basic syllable structure that has been attested in languages worldwide is the combination of a single consonant and a single vowel into a canonical structure represented as CV. However, languages are free to add more consonants before or after the vowel. For the purposes of comparison, let's contrast how English and Somali add consonants and vowels to the universal CV structure:

Table 1. *Comparison of Syllable Structures of English and Somali*

English Syllables	Percentage	Somali Syllables	Percentage
CV	32.49	CV	Not available
CVC	30.22	CVC[iii]	Not available
VC	16.34	VC	Not available
V	8.11	V	Not available
Total of simple onsets or codas	87.07		
CVCC	5.55		
CCVC	2.84		
CCV	2.64		
VCC	0.72		
CCVCC	0.60		
CCCVC	0.24		
CCCVCC	0.19		
CVCCC	0.12		
CCVCCC	0.02		
CCCV	0.01		
Total of complex onsets and codas	12.93		

The English data is taken from Faircloth and Faircloth (1973, p. 78) and the information about the canonical syllable structure of Somali comes from Saeed (1999, p. 25). It is worth noting right away that simple codas can become complex when the suffix <-s> is added to English words to form plural nouns, possessive noun phrases, or when the verb agrees with its third person singular subject in the present tense. So, if morphophonological rules are taken into account, the number of complex codas in English is significantly higher than those reported in

Table 1. Compared to English, Somali syllable structures are rather simple and straightforward: no complex onsets and no complex codas.

DATA ANALYSIS AND METHODOLOGY

The data that serves as the basis for this analysis comes from the George Mason University (GMU) Speech Accent Archive (http://accent.gmu.edu/browse_language.php). As of August 19, 2010, researchers at GMU have compiled 1,309 recorded readings of the text below:

> Please call Stella. Ask her to bring these things with her from the store: Six spoons of fresh snow peas, five thick slabs of blue cheese, and maybe a snack for her brother Bob. We also need a small plastic snake and a big toy frog for the kids. She can scoop these things into three red bags, and we will go meet her Wednesday at the train station.

The goal of the project (as stated on the GMU website) is the following:

> The speech accent archive uniformly presents a large set of speech samples from a variety of language backgrounds. Native and non-native speakers of English read the same paragraph and are carefully transcribed. The archive is used by people who wish to compare and analyze the accents of different English speakers.

Many of the recorded texts have been transcribed by trained graduate students using the International Phonetic Alphabet (IPA) characters and symbols but many more are awaiting transcription. There are six recordings by Somali speakers and three of them have been transcribed phonetically. It is these transcribed texts that serve as the data for my analysis of Somali-accented English.

Table 2. *IPA Transcriptions of Somali Data*

Speaker 1 female, Mogadishu (Speech Accent Archive)	**Speaker 2** male, Erigavo (Speech Accent Archive)	**Speaker 3** female, Borama (Speech Accent Archive)
[plis kal əstɛla æskə her tŭ bũ̃ŋk ḑoʐ fĩŋs wįt her fɹom ðə stɒr sikəs spũns ʌf fɹɛʃ snoʊ pis: faɪf ʂ stɪk θlæbəs ʌf blu ʧiʐ ænd mɛbi ẵ snæk for her bɹʌðer bab wi also nid ẵ smal plæstik əsnæg ænd big˥ tˤɔɪ ʃ foɹk for ðə kʰɪts ʃi kæ̃n əskjup ḑoz fĩŋk ɪn ðə θri ɹɛd bægs æn wi wɪl go mið her wɛnəsdeɪ æt˥ tren stɛʃən]	[pli:s kʰɔl əstɛla æskĭ her tu briŋ ðis θĩŋz wið her frõm dɪ stoɹ sɪks ĭspũns of frɛʃ ĩsno pi:s faɪv t̪ik slæbz əv blu ʧi:s ę̃n meɪbɪ e snæk for her braðer bob wɪ ɔlso ni:d e smol plæstik snek ę̃n eɪ bɪg tɔj frɔg for dɪ kidəs ʃɪ kæ̃n sku:p ḑi:z θiŋz ĩntu θri rɛd bægs ę̃n wɪ wɪl go mi:t her wĩnsḑeɪ ætə dɪ treĩn stɛʃən]	[plis kɔl ɪstila askə xar: tu briŋ dis θiŋks wɪθ xar: frʌm ḑi stoɹ sikəs ɪspũns ŏf fəreʃ: sno pis faɪy θik ɪsɪslɪps ŏy blu: tʃis æ̃n meɪbi ĕ sneɪk for xar bɹaðəɹ bop wĭ ɔlso nid ĕ smol blastɪk snæk æ̃n ĕ bɪk tɔɪ fɹɔŋk for ðə kɪrəs ʃi kæ̃n sku:p ḑis θiŋgəs ɪntŭ t̪ri: reḑ˥ bægs æ̃n wi wɪl go mi:t xar wensdeɪ æt ḑə treɪn steɪʃɔ̃n]

There are advantages and disadvantages in using a standardized text such as this one for phonological analysis. One main disadvantage is that the text may not be representative of the phenomenon under investigation. Though this is often true, in the present case, this disadvantage is mitigated by the fact that the text under consideration was carefully constructed to cover the main sounds of English that contribute to accentedness. In fact, all the phenomena under consideration are amply represented in the recording except for /s/ deletion in the coda. Moreover, the fact that the texts are transcribed by trained phoneticians is an added bonus because I do not have to rely on my own impressionistic judgments. According to the GMU website, utmost care has been used in transcribing all their texts. So, the transcribed texts are taken as prima facie evidence of Somali-accented English without second-guessing the accuracy of the data. I have listened to the recordings numerous times and have perceived only very minute and inconsequential disparities between the proposed IPA transcriptions and my own perception of the pronunciation of specific words. Furthermore, the disparities in question have to do with the transcription of vowels, not that of consonants. In addition to the information available of the GMU website, I have also consulted two M.A. theses (Lindsey, 2006; Admuson-Cisse, 2009) devoted to the pronunciation patterns of Somali ELLs. Now that all the caveats are firmly in place, let us embark on the analysis of the data.

The analysis of the recorded texts focuses only on the pronunciation of /s/ in complex onset and coda clusters. Though there are other phonological issues worthy of attention, they are not taken into consideration for this paper. The paper is organized into three main sections. The first deals with complex onset clusters, the second with complex coda clusters, and the third with suggested pedagogical strategies for addressing the pronunciation of /s/ in the environments mentioned in the two previous sections. The complex onset clusters represented in Table 3 will be the focus for our analysis in this section.

Table 3. *Complex Onset Clusters and Somali Realizations*

Words	Clusters	Occurrences	Somali Realizations
\<Please>	[pl]	2	[plis]/[pliːs]/[plis]
\<Stella>	[st]	3	[əstɛla]/[əstela]/[ɪstila]
\<bring>	[br]	2	[bɹɪŋk]/[brɪ̠ŋ]/[briŋ]
\<from>	[fr]	3	[fɹɔm]/[fr̥ɔm]/[frʌm]
\<store>	[st]	3	[stɒr]/[stor]/[stɔɹ]
\<spoons>	[sp]	1	[spu̯ns]/[ɪspu̯ns]/[ɪspu̯s]
\<fresh>	[fr]	3	[fɹɛʃ]/[frɛʃ]/[fərɛʃː]
\<snow>	[sn]	3	[snoʊ]/[ɪsno]/[sno]
\<slabs>	[sl]	1	[θlæbəs]/[slæbz]/[ɪsɪlɪps]

<blue>	[bl]	1	[blu]/[blu]/[blu:]
<snack>	[sn]	3	[snæk]/[snæk]/[sneɪk]
<brother>	[br]	2	[bɹʌðer]/[braðɛr]/[braðər]
<small>	[sm]	1	[smal/[smɒl]/[smɔl]
<plastic>	[pl]	2	[plæstik]/[plæstik]/[blasʈik]
<snake>	[sn]	3	[əsnæg]/[snek]/[snæk]
<frog>	[fr]	3	[fɔɹk]/[frɔg]/[fɹɔŋk]
<scoop>	[sk]	1	[əskjup]/[sku:p]/[sku:p]
<three>	[θr]	1	[θri]/[θri]/[tri:]
<train>	[tɹ]	1	[tren]/[tr̥eɪn]/[treɪn]
<station>	[st]	3	[steʃən]/[steʃə̩n]/[steɪʃən]

The phonetic transcriptions of words in the fifth column reflect the order in which Speakers 1, 2, and 3 said them. Though as many as 20 onset (initial) clusters appear in the data, in this paper we will concern ourselves only with those that violate a quasi-universal phonotactic constraint called the Sonority Sequencing Principle (SSP). The English onset clusters that violate the SSP are /sk/, /sp/, and /st/.

OVERVIEW OF THE SONORITY SEQUENCING PRINCIPLE (SSP)

The SSP is widely used by phonologists in theoretical studies of the syllable. It is stated in Roca and Johnson (1999, p. 266) as follows:

> The Sonority Sequencing Principle[iv] - The sonority profile of the syllable must rise until it peaks, and then it falls.

The SSP has attained the status of a universal principle even though it was not initially formulated as a language universal. Goldsmith (1990, p. 111) cautions that the SSP is only intended "as a necessary condition for basic syllabification, not a universal statement of possible syllables in any language." In spite of this cautionary note, most analysts today view the SSP as a universal principle or as an "emergent" universal constraint. The SSP owes its "elevated" status to the fact that it is applicable to a very large number of languages. Linguists have depended on sonority levels between sequences of sounds to describe specific languages and offer generalizations. Each phoneme is deemed to have a sonority scale, as explained by Ladefoged (2006, pp. 239-40): "The sonority of a sound is its loudness relative to that of other sounds with the same length, stress, and pitch." Taking cues from other linguists, Goldsmith (1990, p. 112) has assigned a fairly comprehensive system of numerical values to almost all

classes of phonemes. He defends his approach by arguing that "while there is considerable skepticism that the ultimate account of sonority is one based on an arithmetic system of this sort, there may be something right about an account that is sufficiently oriented to measuring sonority differences to be able to state unambiguously that liquids are halfway between obstruents and vowels." The analysis in this paper is based on Goldsmith's numerical values because they offer a quantifiable means by which one can account for Somali-accented pronunciation of /s/ in various complex clusters.

Table 4. *The Arithmetic of Sonority*[v]

Sounds	Sonority Indexes	Features
[a, æ, ə]	10	low vowel
[e, o]	9	mid vowels
[i, u, j, w]	8	high vowels
[r]	7	rhotic
[l]	6	liquid
[m, n, ŋ]	5	nasals
[s]	4	sibilant
[v, z, ð]	3	voiced fricatives
[f, θ]	2	voiceless fricatives
[tʃ, dʒ]	1.5	affricates[vi]
[b, d, g]	1	voiced stops
[p, t, k]	0.5	voiceless stops

English complex onset clusters behave in two ways with respect to the SSP. In most cases, they conform to it. In other cases, they violate it. Various attempts have been made to explain away the violation of the SSP. Roca and Johnson (1999, pp. 290, 488) resort to a suspicious historical argument to claim the /s/ in /sk/, /sp/, and /st/ onset clusters should be considered extrasyllabic, namely that it is a syllable all by itself. However, doing so violates another important syllabification principle, Exhaustive Syllabification, which requires that all non-sonorant segments be part of a syllable. Since /s/ is not a sonorant, it would be strange to make an exception for it and postulate that it is a syllable all by itself. For other attempts to deal with the violation of the SSP, see Cho and King (2003, p. 185).

The syllable structure rules of many world languages do not permit two or more consonants to occur in the onset of a syllable. In fact, English is in the company of only a small number of languages that allow two or three consonants at the beginning of syllables. Therefore, English complex onset clusters violate the SSP. This paper seeks to provide some insight on accented English by attempting to answer the following question: What happens when a person whose first language conforms to the SSP wants to learn a language such as English that violate it? Research done by Guffey (2002) and others on Spanish speakers learning English has found that the SSP is a major contributor to accentedness. The disparity between English and Spanish

complex onset clusters is the main reason why English words such as [spɔrt] <sport>, [stʌdi] <study>, and [ski] <ski> are pronounced by many Hispanics as [ɛspɔrt], [ɛstʌdi] and [ɛski] respectively. Hispanics who are learning English as a second language transfer their simpler onset structure into English. How do Somali speakers fare when they are confronted with English /sk/, /sp/, and /st/ onset clusters?

The Violation of the SSP and Somali Speakers

The data in Table 3 shed some light on the question raised in the previous paragraph. There are 30 complex onset clusters in the data containing an initial /s/. The three Somali speakers had a hard time pronouncing 10 of them accurately. This represents an error rate of 33.33%. More specifically, 15 of these 30 words begin with /sk/, /sp/ and /st/ clusters. The Somali speakers mispronounced six of them, that is, an error rate of 40%. A case in point is the pronunciation of [stɛlə] <Stella>. All three Somali speakers realized it either as [əstɛla], [əstela], or [ɪstila]. Let's see how the syllabification displays depict the sonority profile of <Stella> as produced by Minnesotan Speaker 143[vii] and that of Somali Speaker 1:
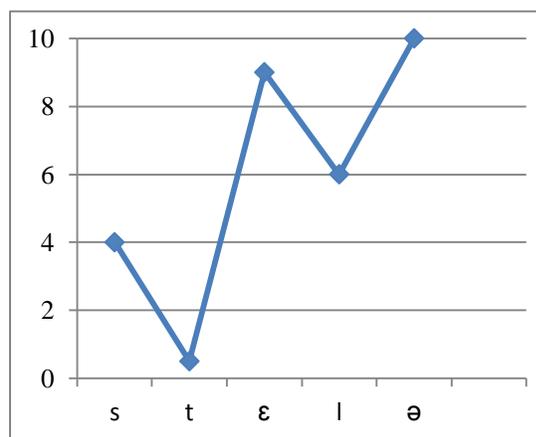

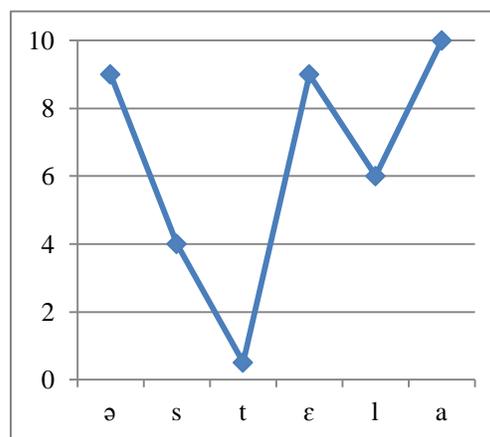*Figure 2*. Syllabification display of [stɛlə] by speaker 143

Figure 3. Syllabification display of [əstɛla] by Somali speaker 1

The pronunciation of Speaker 143 violates the SSP because the sonority index drops from [s] (4) to [t] (0.5). The SSP constraint requires the sonority profile to rise, not to drop. How do Somali speakers deal with this violation of the SSP? They completely resyllabify the word [stɛlə]. Instead of it being a two-syllable word [stɛ•lə], it becomes a three-syllable word in Somali-accented English [əs•tɛ•la]. The complex onset cluster [st] becomes [əs]. The restructured syllables in Somali English conform to the SSP. The insertion of the schwa allows [əs] to become a full-fledged syllable. The sound sequence [tɛ] also becomes its own syllable, and so is [la]. As noted earlier, the resyllabification of English words such as <scoop>, <spoon>, and

<Stella> that contain /sk/, /sp/, and /st/ in the onset accounts for 40% of complex onset errors. In general, if an English complex onset does not violate the SSP, Somali speakers have less difficulty with it. Thus, the pronunciation of /s/ in words such <snow>, <snack>, and <small> has a higher degree of accuracy. There are however, some surprising findings. Though, one would expect the speakers to have some difficulty with <store> and <station>, they did not. Conversely, even though the /s/ in <slab> does not violate the SSP, two speakers mispronounced the word. These "anomalies" show that Ladefoged (2006, p. 240) was right in saying that "a sonority theory of the syllable will not, however, account for all observed facts." Yet, the SSP can also help answer teachers' questions as to why Somalis generally insert the vowel [ə] at the beginning of /sk/, /sp/, and /st/ clusters.

THE PRONUNCIATION OF <-S> IN THE CODA

The three speakers produced a total of 30 coda clusters involving <-s>, as shown in Table 5. The pronunciation of <-s> (which may be either [s] or [z]) in 26 of its 30 occurrences shows a deviation from expected norms. This represents a mispronunciation rate of 86.6%. This underscores the fact that <-s> is more often mispronounced in coda clusters than in the onset clusters.

Table 5. *Complex Coda Clusters*

Words	Clusters	Occurrences	Somali Realization
<ask>	[sk]	1	[æskə]/[æskɪ]/[æskə]
<bring>	[ŋ]	1	[bɹiŋk]/[brɪŋ]/[briŋ]
<things>	[ŋz]	2	[fɪ�প̪s]/[θɪ̪ŋz]/[θɪŋks]
<six>	[ks]	1	[sikəs]/[sɪks]/[sɪkəs]
<spoons>	[nz]	1	[spu̞ns]/[ɪspu̞ns]/[ɪspu̞s]
<slabs>	[bz]	1	[θlæbəs]/[slæbz]/[ɪsɪlɪps]
<kids>	[dz]	1	[kʰɪts]/[kidəs]/[kɪɾəs]
<things>	[ŋz]	2	[fɪ̪ŋk]/[θɪŋz]/[θiŋgəs]
<bags>	[gz]	2	[bægs]/[bægs]/[bægs]
<Wednesday>	[nz]	2	[wɛnəsdeɪ/wɪnsdeɪ/[wensdeɪ]

The pronunciation difficulties encountered by Somali speakers can best be accounted for by the Coda Condition. The SSP and the Coda Condition are like the two sides of the same coin. The SSP accounts for accented pronunciation in complex onsets while the Coda Condition sheds light on the pronunciation difficulties in complex codas. Kenstowicz (1994, p. 254) states the Coda Condition as follows:

Coda Condition **-** Codas fall in sonority from the nucleus.

Yavaş (2006, p. 139) elaborates on the Coda Condition by observing that "this means that optimal codas should have the sonority dropping as we move from C_1 to C_2." English can allow up to four consonants in the coda if the inflectional suffix <-s> is included in the count. According to the Coda Condition, the sonority must fall from the nucleus down to the closest consonant. The sonority must continue falling from that consonant until we reach the last consonant in a complex coda. If the sonority does not fall, then the Coda Condition has been violated. The coda structure of English syllable structures differs in significant respect from Somali coda structure, where only one consonant is allowed. As a result, pronunciation difficulties in the coda are to be expected.

The singular focus of this section of the paper is on the English plural suffix <-s> when it is added to syllable codas ending in /p, b, t, d, k, g/. The inflectional morpheme <-s> has three allophones: [s], [z], and [əz]. Only the first two pronunciations of <-s> violate the Coda Condition. The pronunciation [əz] does not violate the Coda Condition because [ə] has a sonority index 10 and [z] is 3, a drop of sonority. How do the three Somali speakers deal with the plural suffix <-s> when it is added to syllables whose codas are /p, b, t, d, k, g/? To illustrate this, let's compare the pronunciation of [kɪdz] <kids> by English Speaker 143 and by Somali Speaker 2.
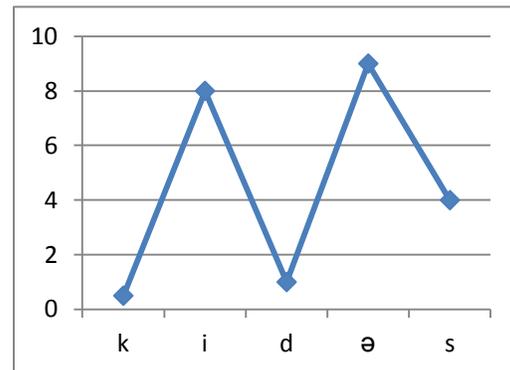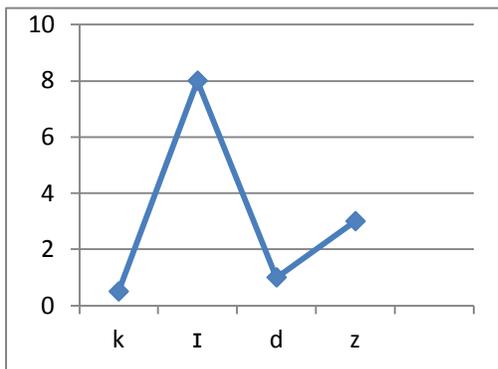

Figure 5. Syllabification display of [kɪdz]   *Figure 6*. Syllabification display of [kidəs]
by Speaker 143   by Somali speaker 2

The Coda Condition is violated in English because the sonority index drops from the nucleus [ɪ] (8) to [d] (1) and then rises again to [z] (3). How do Somali speakers generally respond when English words violate the Coda Condition? In the case of [kɪdz], they resyllabify the word by introducing a [ə] between [d] and [z]. The coda clusters in the data which violate the Coda Condition are [bz], [dz], and [gz] in the words [slæbz] <slabs>, [kɪdz] <kids>, and [bægz] <bags>. There are nine occurrences of such codas clusters in the data and eight of them are mispronounced. This represents an error rate of 88%. Moreover, in such cases, more often than not, Somali speakers fail to voice <-s> even when it occurs after a voiced consonant.

Pronunciation difficulties when the Coda Condition is violated extend beyond the inflection suffix <-s>. It also happens when the grapheme <x> occurs in the coda, as illustrated by the pronunciation of [sɪks] <six>:
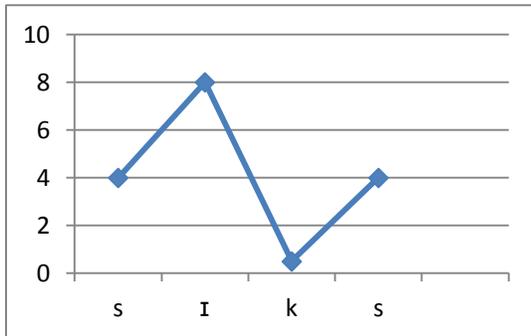
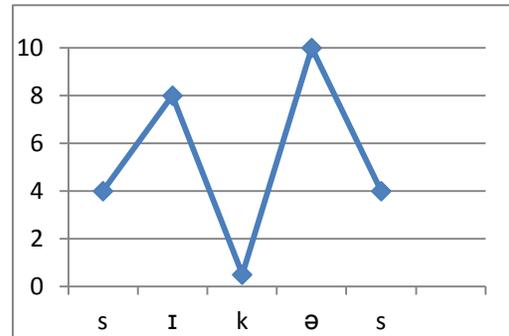*Figure 7*. Syllabification display of [sɪks] by Speaker 143

Figure 8. Syllabification display of [sɪkəs] by Somali speaker 3

The grapheme <x> consists of a sequence of two sounds [k] and [s]. In [sɪks]<six> the sonority level drops from [ɪ] (8) to [k] (0.5), and then rises again to [s] (4). The rise from [k] to [s] in the pronunciation of Speaker 143 violates the Coda Condition. Somali speakers 1 and 3 respond to this violation by resyllabifying [sɪks] into [si•kəs], as shown in Figure 8. The propensity of Somali speakers to resyllabify English coda clusters that violate the Coda Condition has also been attested in the spelling of college students. Admundson-Cissé (2009, p. 88) cites erroneous spellings of <parents> and <symbolism> as <paran**t**es> and <symbolis**i**m>, respectively.

The same resyllabification strategy is used in the pronunciation of the word [æsk] <ask> by all three speakers. They pronounce it as [æs•kə] or [æs•kɪ], that is, they insert an epenthetic vowel to break up the complex coda cluster [sk] even though this cluster does not violate the Coda Condition. The sonority value of /æ/ is 10, that of /s/ is 4, and the one for /k/ is 0.5. The sonority profile of [æsk] falls from the nucleus, as expected. Why then do the three Somali speakers resyllabify [æsk] as [æs•kə] or [æs•kɪ]? The answer is that Somalis tend to resyllabify coda clusters whether they violate the Coda Condition or not. Lindsey (2006, p. 55) also reports that vowel epenthesis is a very noticeable feature of Somali-accented English:

> In a recent conversation with ELL teachers, I was asked by several of them why Somali speakers of English add an /i/ to the end of their words. I asked for some examples and was given the following words: [fɪrsti] <first>, [hɪrti] for <hurt>, [ʃarki] for <shark>, [kaʊnti] <count>, and [læsti] for <last>. It is also interesting to note that these words also fit the pattern of errors in words that I have observed my students say.

None of these examples violates the Coda Condition, and yet Somali speakers insert an epenthetic /i/ to break up coda clusters.

PEDAGOGICAL IMPLICATIONS AND APPLICATIONS

The various rates of accented pronunciations of /s/ in complex onset clusters and <-s> in coda clusters are as follows:
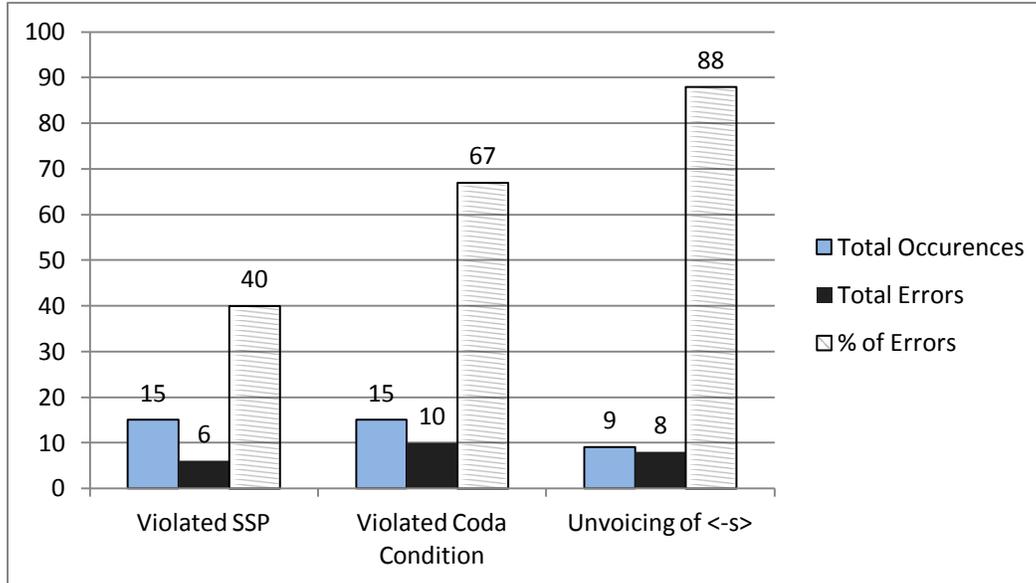

Figure 9. Ratio of errors per occurrence

The graphs show that coda cluster errors are more pervasive than onset cluster errors. Moreover, the percentage of errors increases tremendously when the suffix <-s> is not voiced.   Normally, the morphophonological rule dictates that the suffix <-s> be pronounced [z] when it is added to voiced segment, be it a consonant or a vowel. Koffi (2010) and Wardhaugh (2010, p. 148) discuss the fact that failure to comply with morphophonological rules invites a negative evaluation of the speaker. Consequently, teachers of Somali ELLs should see to it that the <-s> that occurs in the coda after voiced segments is properly voiced. I suggest, following Celce-Murcia et al. (2010, pp. 104-5) that teachers exaggerate the pronunciation of <-s> after voiced segments as [z]. So, the <-s> in <peas> and <bags> should be taught to Somali students as [pi:zzzz] and [bægzzzz] respectively.

The pronunciation of /s/ in /sk/, /sp/ and /st/ in onset clusters also needs attention because such sequences violate the SSP. Again, following Celce-Murcia et al. (2010, pp. 104-5), I suggest that teachers teach their Somali students to exaggerate the initial /s/ in the clusters mentioned above. I propose that the initial /s/ in the words <scoop>, <spoon> and <Stella> be elongated as /sssskup/, /sssspun/ and /sssstɛlə/. Pronouncing the initial /s/ accurately in these onset clusters is necessary lest Somali speakers are misunderstood by less cosmopolitan interlocutors who are not familiar with accented English. Word recognition experts who subscribe to the Cohort Model contend that the beginning of words is crucial for accurate word recognition. Byrd and Mintz (2010, p. 170) describe the Cohort Model as follows, "According to this theory, the first

phonological unit of a word, as recovered from the speech signal activates all the words in the listener's mental lexicon that begin with that sound." Since the Cohort Model relies on bottom-up processing, it can explain why, if an English word begins with an /sk/, /sp/, or /st/ cluster and if a Somali speaker pronounces it with an initial /ə/, this may cause the hearer to search in his/her mental lexicon for all the words that begin with a schwa. This miscue may actually cause some 250 milliseconds delay in recognizing the target word that the speaker is trying to say (Byrd & Mintz, 2010, p. 163). This may also cause the Somali speaker to have to repeat himself or herself more than once before being understood.

Coda cluster simplification by the deletion of one of the segments has been attested in Somali-accented English. Unfortunately, the text provided by the Speech Accent Archive does not give any evidence of it. Lindsey (2006, pp. 54-5), however, does not seem concerned by this pronunciation because "consonant cluster simplification by deletion strategies[viii] are used primarily by beginning students. As students progress to the intermediate level (where most of my students are), they tend to not simplify their consonant clusters by deletion. This has been confirmed by other ELL teachers of Somali who rarely speak of consonant cluster deletion as a serious problem." It should also be noted here that native and proficient speakers of American English do not think that coda cluster simplification by deletion is a serious problem because they too engage in it, as indicated by Yavaş (2006, p. 141):

> It would be appropriate to point out some modifications that are commonly observed with respect to deletions in the final clusters. When the word ending in a cluster is followed by a word that begins with a consonant, the final member of the cluster is deleted.

However, both Yavaş and Celce-Murcia et al. (2010, p. 107) add a very important caveat that needs to be heeded by teachers of Somali ELLs, namely that the suffix <-s> is rarely ever deleted by native/proficient speakers of English because of the vital grammatical load that it carries.

SUMMARY

The Sonority Sequencing Principle and the Coda Condition lend support to the notion that aspects of Universal Grammar may be responsible for accentedness. Somali speakers' pronunciation of complex onset clusters that begin with /s/ are less problematic when such words conform to the SSP. Similarly, complex coda clusters that conform to the Coda Condition are less difficult to pronounce than those that do not. If a teacher has Somali students in his/her class, all he/she needs to do is teach the students to explicitly and consistently violate the quasi universal SSP and Coda Condition constraints. The pedagogical strategy that seems to work best in this situation consists in teaching learners to elongate and exaggerate /s/ in /sk/, /sp/ and /st/ clusters into [ssssk], [ssssp], and [sssst]. As for <-s> in coda clusters, it should not only be elongated, but it should also be voiced. So, the words [bægz] and [pi:z] would be pronounced respectively as [bægzzzz] and [pi:zzzz].

[ii] The following conventions are used throughout the paper: < > represents the orthographic transcription of a grapheme, / / stands for the phonemic transcription, and [ ] for the phonetic transcription. Their use in the paper is not arbitrary but corresponds to the type of argumentation being presented.

[iii] Saeed (1999, p. 17) provides the following minimal pair [war•an] (spear) and [warr•an] (tell news) to show that a CVCC pattern is possible. However, in all such cases, the two contiguous CCs represent a lengthened consonant which can be transcribed phonemically as /C:/. Consonant lengthening is phonemic in some East African languages, including Somali.

[iv] For CV languages, the sonority profile of the syllable rises and peaks but it does not fall. So, the SSP applies mostly to CVC languages. Since English and Somali have CVC syllables, the SSP applies to both languages.

[v] Various sonority values have been proposed. Roca and Johnson (1999, p. 288) propose a slightly different system from the one given here. Guffey (2002, p. 3, 5, 10) lists at least four other scales. The one proposed by Goldsmith is used in this analysis because it is the most comprehensive. I have augmented Goldsmith's list of phonemes by including information from Yavaş (2006, p. 131).

[vi] Goldsmith omits to assign numerical values to affricates on p. 112. However, on the previous page he ranks their sonority level between that of stops and fricatives. Consequently, assigning the value of 1.5 is fairly accurate. Guffey (2002, p. 10) makes a similar observation.

[vii] The Speech Accent Archive identifies a 42 year-old male speaker from St. Paul, Minnesota as speaker 143. His speech is used throughout this paper as model of speech that Somalis who live in the state are more likely to hear.

[viii] "In the coda" is intended by the author but was not explicitly stated.

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