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## The Role of Syllable Structure in the Acquisition of American English by Three Native Amharic Speakers

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# THE ROLE OF SYLLABLE STRUCTURE IN THE ACQUISITION OF AMERICAN ENGLISH BY THREE NATIVE AMHARIC SPEAKERS

TONJA BROWN

## 1.0 Introduction

For many non-native English speakers, certain aspects of the English language can cause significant pronunciation difficulties. One such problematic area is within complex consonant clusters, both in the onset and in the coda. The onset, for instance, may be challenging for some non-native English speakers because English is one of only a few languages that allow two or more consonants in the onset of a syllable (Koffi, p. 135). For languages like Amharic, which do not allow for complex onset clusters, (except in very specific, rare instances), transfer of L1 knowledge to English may actually hinder the way that the Amharic speaker pronounces English onset clusters.

A consonant cluster is a grouping of two or more consonants that occur without a vowel in between the consonants. For example, <speak> has a complex *onset* consonant cluster of [sp], because [sp] occurs at the beginning (onset) of the syllable. The word <grand> has a complex *coda* cluster because [nd] is after the nucleus (vowel) of the syllable. Importantly, a consonant cluster is not simply two consonants next to each other in a word, but a differentiation between sounds. For example, <the> has no consonant cluster because <th> is realized as one sound [θ]. However <three> is a consonant cluster as <thr> is realized as [θr].

The Amharic language is described as not having complex onset clusters and few complex coda clusters; therefore, it could be presumed that English would present difficulties in pronunciation to native Amharic speakers when encountering these situations. To show the differences between the Amharic and English allowable syllable structures, I have included below a comparison of the simple and complex codas encountered in American English and Amharic languages (Table 1):

**Table 1:** Comparison of Syllable Structures of English and Amharic

| English Syllables                            | Percentage   | Amharic Syllables | Percentage    |
|--|--------------|-------------------|---------------|
| CV   | 32.49        | CV                | Not available |
| CVC  | 30.22        | CVC               | Not available |
| VC   | 16.34        | VC                | Not available |
| V  | 8.11         | V                 | Not available |
| <b>Total of simple<br/>Onsets or codas</b>   | <b>87.07</b> |                   |               |
| CVCC   | 5.55         | CVCC              | Not available |
| CCVC   | 2.84         | CCVC*             | Not available |
| CCV  | 2.64         | CCV*              | Not available |
| VCC  | 0.72         | VCC               | Not available |
| CCVCC  | 0.60         |                   |               |
| CCCVC  | 0.24         |                   |               |
| CCCVCC                                       | 0.19         |                   |               |
| CVCCC  | 0.12         |                   |               |
| CCVCCC                                       | 0.02         |                   |               |
| CCCV   | 0.01         |                   |               |
| <b>Total of complex<br/>Onsets and codas</b> | <b>12.93</b> |                   |               |

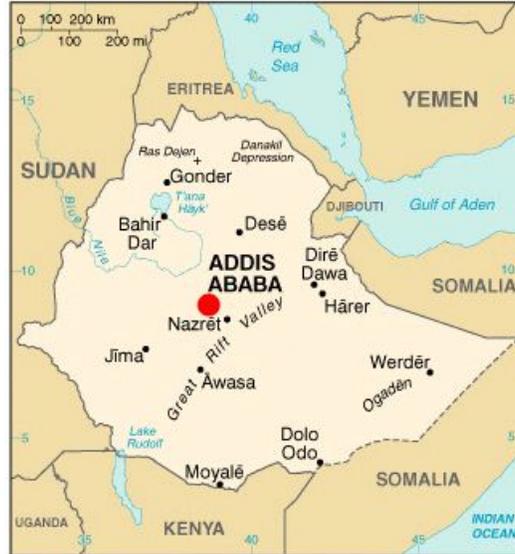
## 2.0 Data Analysis and Methodology

The pronunciation data and IPA text transcriptions that were used for this study were taken from the George Mason University (GMU) Speech Archive web page: <http://accent.gmu.edu>. The English text is as follows:

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 for the kids. She can scoop these things into three bags, and we will go meet her Wednesday at the train station.

There are 15 total recorded speech samples on the GMU archive list for the Amharic language. Of these samples, eight are male and seven are female; fourteen of the fifteen speakers originate from Addis Ababa, and one from Gonder. Because the majority of the samples are from one location, it is not possible within the scope of this analysis to do a good investigation of how or what the differences in English pronunciation might be by individual Amharic speakers based on geographical origins of birth. I did, however, include the one sample from Gonder in this paper to provide an alternate example from the two from Addis Ababa.

**Illustration 1:** *Location of Gonder and Addis Ababa*



<http://accent.gmu.edu/maps/addisababa.gif>

For this study, I used three of the female Amharic speakers, numbers 10, 11 and 12, for comparison, as they are relatively similar in their stated ages (24-29 years old) and age of English language onset (15-19 years old). The native language for all three speakers is Amharic. Amharic speaker #10 is a 29 year old female born in Gonder, Ethiopia. She moved to the United States at age 19, where she acquired her knowledge naturally as opposed to formal academic learning. Amharic speaker #11 is a 24 year old female born in Addis Ababa, Ethiopia. She lived in the United States for 9 years, and learned her English at age 17 in an academic setting. Amharic #12 is a 26 year old female who has lived in the United States for 10 years. She learned English at age 15 in an academic setting as well. Below are the three samples of their IPA transcripts from the above listed text:

**Table 2: IPA Transcriptions of Amharic Data**

| Speaker 10: female, Gonder<br>(Speech Accent Archive)  | Speaker 11: female, Addis Ababa<br>(Speech Accent Archive)   | Speaker 12: female, Addis Ababa<br>(Speech Accent Archive)   |
|--|--|--|
| [pǝlɪz kəl stela ask f askə hɜ tsu:<br>bɪŋ dəs θɪŋ wɪz hɜ fɪŋm də sɪtɪ<br>sɪks əspɪn ɔf fɪɛf snous pɪnz faɪf<br>tɪk sleəp ɔf blu tʃɪz æn meɪbi ɛ<br>snæk fɪ hɜ bɪɔdʰ hɜ bɪɔðə bəb<br>wi alʸso nidʰ ?ə sməl plæstɪk snæk<br>ænd ə bɪg tʰɔɪ fɪð fɪa: fɪa dɜ kɪts ðə<br>kɛn skup dɪs fɪŋ tu ɪntu dɛ ɹedʰ bæŋ<br>ænd wi wɪlʸ gou mitʰ hɜ wɪnzdeɪ<br>at də treɪn steɪʃən] | [pʰlɪs kol ɪstela ask ɛɪ tu bɪŋ dɪs<br>fɪŋs wɪt hɛɪ fɪŋm də sɪtɪ sɪks<br>ɪspɪns ɔf fɪɛf ɪsno pɪs faɪf tɪk<br>slep əb blu: tʃɪz ɛnd meɪbi ɪ<br>snæk fɔ hɜ bɪɔdʰə bəb wi ɔlʸso<br>nid ɪ sməl plæstɪk snæk ɛn ə bɪk<br>tʰɔɪ fɪɔŋ fɪŋm də kɪts fɪ kʰən<br>skup dɪs fɪŋs ɪntu tʃɪ ɹedʰ bæks<br>ænd wi alʸs: wi: wɪlʸ gə mit hɜ<br>wɪnstɛɪ æt də tɪɛn steɪʃən] | [pǝlɪz kəl stela ask f askə hɜ tsu:<br>bɪŋ dəs θɪŋ wɪz hɜ fɪŋm də sɪtɪ<br>sɪks əspɪn ɔf fɪɛf snous pɪnz faɪf<br>tɪk sleəp ɔf blu tʃɪz æn meɪbi ɛ<br>snæk fɪ hɜ bɪɔdʰ hɜ bɪɔðə bəb<br>wi alʸso nidʰ ?ə sməl plæstɪk snæk<br>ænd ə bɪg tʰɔɪ fɪð fɪa: fɪa dɜ kɪts ðə<br>kɛn skup dɪs fɪŋ tu ɪntu dɛ ɹedʰ bæŋ<br>ænd wi wɪlʸ gou mitʰ hɜ wɪnzdeɪ<br>at də treɪn steɪʃən] |

For this paper, I am not questioning the accuracy of the transcriptions. This has been done by others to their and my own satisfaction (Koffi, p 133) and I will make use of the transcripts as they are written on the GMU Archive web site.

### 3.0 The Sonority Sequence Principle (SSP)

The sonority principle is a numerical formulation describing what happens with the sonority between sounds in a word. “Between any member of the syllable and the syllable peak, a sonority rise or plateau must occur” (Blevins, 1996). Sonority, according to Yavas (2011) is described as such: “Sonority of a sound is primarily related the degree of opening of the vocal tract during its articulation. The more open the vocal tract is for a sound, the higher its sonority will be” (p. 135). There are different suggested hierarchies of sonority; however, this paper uses the one chosen by Koffi (2011) who used Goldsmith (1990) in his research for the index representation and all such analysis done in this paper reflects these numerical values:

**Table 3:** *List of Sonority Indexes*

| 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 <sup>vi</sup> |
| [b, d, g]    | 1                | voiced stops             |
| [p, t, k]    | 0.5              | voiceless stops          |

#### 4.0 The Violation of the SSP and Amharic Speakers

What the above chart and SSP describe, is that in any given syllable, the sonority rises to a peak (based on a numerical value listed in the above sonority index), and then falls from there. If at any time within a syllable, there is any other pattern, this variation is termed a *violation* of the Sonority Sequence Principle (SSP). One example of such SSP violation occurs with English onset /s/ clusters which include /p, t, k/. In addition, within any given language there is a minimal allowable distance that is tolerable within the clusters in any particular language. English allows a minimal distance in an upward flow of 6-2 between two consonants in an onset. However, in the example I just listed, the /s/ clusters result in a negative sonority, which is a violation of the upward movement to a peak before falling.

#### 4.1 Amharic and Complex Onset Consonant Clusters

Table 4 shown below lists the words in the GMU readings which have complex onset clusters, and inventories the three realizations of the Amharic speakers analyzed in this paper. There are twenty words, equaling a total of sixty realizations all together. I have listed Amharic speakers IPA transcriptions in their respective numerical order:

**Table 4:** *Complex Onset Clusters and Amharic Realizations\**

| Words     | Clusters | Occurrences | Amharic Realizations 10,11,12  |
|-----------|----------|-------------|--------------------------------|
| <Please>  | [pl]     | 2           | [pǝliz] [pʰlis] [pʰlis]        |
| <Stella>  | [st]     | 3           | [stɛla] [ɪstɛla] [ɪstɛɻ]       |
| <bring>   | [br]     | 2           | [bɹiŋ] [bɹiŋ] [bɹiŋ]           |
| <from>    | [fr]     | 3           | [fɹom] [fɹom] [fɹom]           |
| <store>   | [st]     | 3           | [s:tɔɹ] [stɔɹ] [stɔɹ]          |
| <spoons>  | [sp]     | 1           | [ɔspũn] [ɪspuns] [ɪspũn]       |
| <fresh>   | [fr]     | 3           | [fɹɛʃ] [fɹɛʃ] [fɹɛʃ]           |
| <snow>    | [sn]     | 3           | [snɔʊs] [ɪsno] [sno]           |
| <slabs>   | [sl]     | 1           | [slɛɔp] [slɛp] [ɪslɔps]        |
| <blue>    | [bl]     | 1           | [blu] [blu:] [blu:]            |
| <snack>   | [sn]     | 3           | [s:nɪæk] [snæk] [snæk]         |
| <brother> | [br]     | 2           | [brɔð] [bɹɻðɛ] [bɹɻðɛ]         |
| <small>   | [sm]     | 1           | [smɔl] [smɔl] [smɔl]           |
| <plastic> | [pl]     | 2           | [plæstɪk] [plæstɪk] [pʰlæstɪk] |
| <snake>   | [sn]     | 3           | [snæk] [snæk] [ɪsnak]          |
| <frog>    | [fr]     | 3           | [fɹɑ:] [fɹɔg] [fɹɔg]           |
| <scoop>   | [sk]     | 1           | [skɔp] [skɔp] [ɪskɔp]          |
| <three>   | [θr]     | 1           | [dɛ] [tri] [tri]               |
| <train>   | [tɹ]     | 1           | [treɪn] [tɹən] [tɹən]          |
| <station> | [st]     | 3           | [steɪʃɔn] [steɪʃən] [steɪʃən]  |

After doing analysis on the patterns in the clusters), I divided the clusters into three categories: non /s/ clusters, clusters with /s/ that did not violate SSP, and clusters with /s/ that violated SSP (Table 5). There was a clear pattern in the types of errors made by the three speakers. Onset clusters that had an /s/ comprised 60% of the violations, with the /s/ clusters that violated the SSP having the majority (40%) of the errors. In addition, there was a very close amount of errors between the total of *all* the non-violating SSP (12%) and the total of the three violating clusters /sk/, /sp/ and /st/ (10%). This suggests that Amharic speakers' primary difficulties—at least statistically—are with the three English /s/ clusters that violate the SSP rule, and seek to accommodate for SSP adherence in other ways.

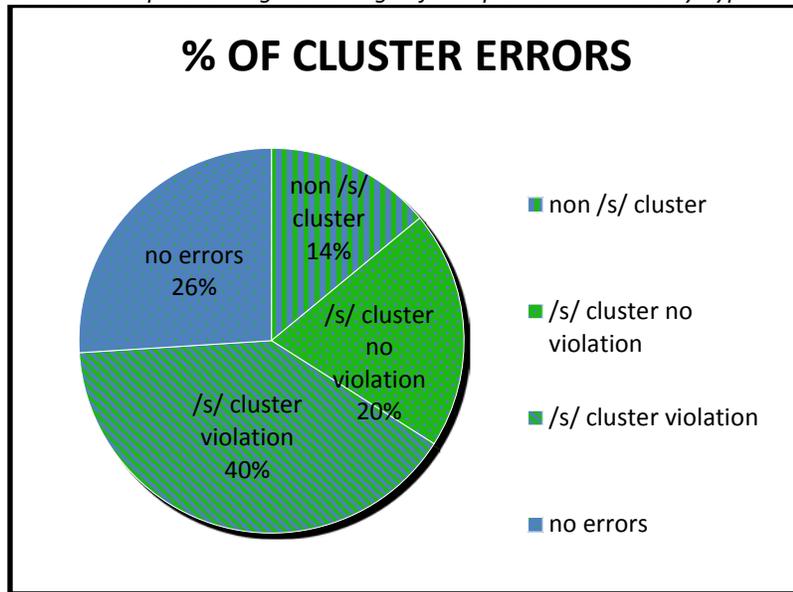
**Table 5: Complex Onset Errors by Cluster Type**

|                                 | Cluster Type | # of Tokens | # of Errors | % of Errors in Word |
|---------------------------------|--------------|-------------|-------------|---------------------|
| <b>NON /s/ CLUSTERS</b>         |              |             |             |                     |
|                                 | [bl]         | 30          | 0           | 0.00                |
|                                 | [pl]         | 30          | 2           | 33.00               |
|                                 | [br]         | 30          | 0           | 0.00                |
|                                 | [fr]         | 30          | 1           | 33.00               |
|                                 | [tr]         | 30          | 0           | 0.00                |
|                                 | [θr]         | 30          | 1*          | 33.00               |
| <b>TOTAL</b>                    |              | <b>30</b>   | <b>4</b>    | <b>14.00%</b>       |
| <b>/s/ CLUSTER NO VIOLATION</b> |              |             |             |                     |
|                                 | [sl]         | 15          | 1           | 33.00               |
|                                 | [sm]         | 15          | 0           | 0.00                |
|                                 | [sn]         | 15          | 2           | 22.00               |
| <b>TOTAL</b>                    |              | <b>15</b>   | <b>3</b>    | <b>20.00%</b>       |
| <b>/s/ CLUSTER VIOLATION</b>    |              |             |             |                     |
|                                 | [sk]         | 18          | 1           | 33.00               |
|                                 | [sp]         | 18          | 3           | 100.00              |
|                                 | [st]         | 18          | 2           | 22.00               |
| <b>TOTAL</b>                    |              | <b>15</b>   | <b>6</b>    | <b>40.00%</b>       |

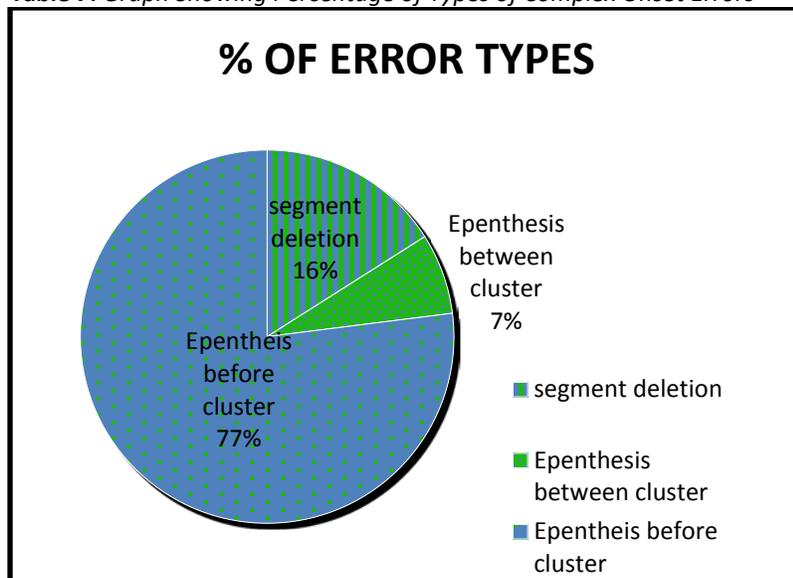
Of the 13 errors, only two words (16%) had a deletion of a consonant segment [fɔg] and [dɛ] with one word [pɛliz] using epenthesis between the two consonants (7%). The vast majority of the errors were epithetical (77%), placing a vowel in front of the consonant cluster.

One important note on Amharic onset syllable structure is the rare allowable instances of a complex consonant onset only if the second consonant is a liquid [r] or [l]. This could account for the lower errors in these types of words along with the SSP, although the speakers were not consistent with errors in relation to these two sounds. There were a total of 33 [r] and [l] word tokens: /pl/, /sl/ and /bl/ accounted for 12, with 3 errors (25%); /br/, /fr/, /tr/ and /θr/ totaling 21 tokens with only 2 errors (.09%) for a total of 5 out of 33 errors (15%). However, even accounting for this allowance, the primary difficulty with onset complex clusters for Amharic speakers still remains with the original problem of the SSP rule.

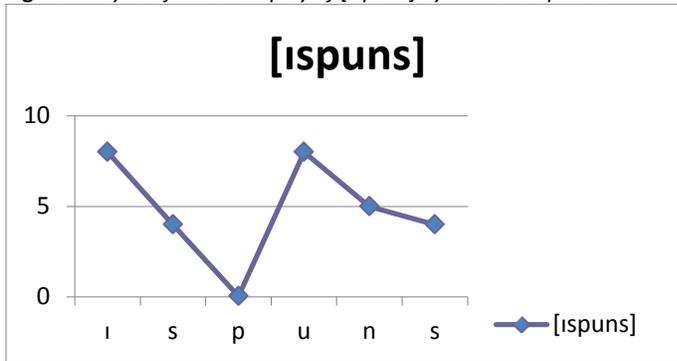
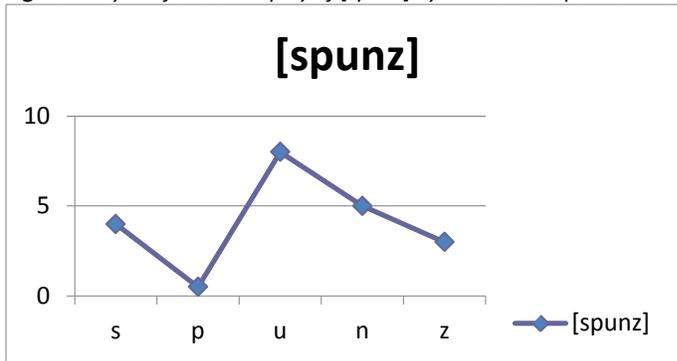
**Table 6:** Graph Showing Percentage of Complex Onset Errors by Type



**Table 7:** Graph Showing Percentage of Types of Complex Onset Errors



Of the three /s/ violating onset clusters, all three speakers had difficulties with /sp/ in <spoons>. The structure of the onset in this word is CCV where the SSP drops between /s/ and /p/ then rises again for /u/. To correct for the violation in the SSP rule, all of the Amharic speakers resyllabified the word by adding a vowel before the onset, to make the new syllable VC. The adjustment then changed the word from monosyllabic to two-syllables [ɔs•pūn] [is•puns] [is•pūn]. Here is an example of how <spoons> is pronounced by Minnesota #143 speaker (Figure 2) compared to Amharic speaker #11(Figure 1) and how the SSP looks for both of the pronunciations:

**Figure 1:** Syllabification display of [ispuns] by Amharic Speaker 11**Figure 2:** Syllabification display of [spunz] by Minnesota Speaker 143

Based on the examples represented in this paper, I have, therefore, concluded that Amharic speakers do have difficulties with English words that have complex onset clusters. The primary method that the Amharic speakers use to accommodate this challenge is through a resyllabification of the onset with a vowel just prior to the initial consonant. By resyllabifying the word, the speakers adjust for possible SSP violations.

#### 4.2 The Nucleus and Vowel Inventory

In general, when comparing the three Amharic speakers with Minnesota English speaker #143, the three Amharic speakers had *individualized* difficulties pronouncing vowels, with each speaker having an error rate of 33%, 32% and 33% respectively. In one instance, Amharic speaker #10 had a large error rate between [i] and [ɪ] vowels, where she tended to raise the lax vowel to a tense vowel; this error, however, was not nearly as prevalent with the other two speakers in this study as it was for #10. This could be a vocalic difference between English and Amharic languages, as [ɪ] is not a naturally occurring Amharic phoneme, rather an allophone (Hayward, p.47), or it could be a dialectical difference between the speakers, as #10 was the one speaker in this study from Gonder. It is also true that Amharic speaker #10 learned English naturally, opposed to academically, as did the other two speakers who may have been taught the [ɪ] pronunciation. What I determine is that with the exception of the schwa and six other words <these>, <plastic>, <frog>, <from>, <slabs> and <red> in the recordings, none of the errors between the three speakers were consistent. With the first five of these words I listed, there was

a tendency to raise the low English vowels to a [ɔ] by all three of the speakers. This is consistent with what the speakers did with the schwa when they changed the [ə] sound. The last word <red> seemed to be an error correction from Minnesota English #143, where he pronounced the vowel as an [e], and the Amharic speakers pronounced it as [ɛ].

One of the most troublesome vowels for the Amharic speakers was with the schwa [ə] (Table 8). However, the difficulty did not lie with internal word syllable structure, as much as the problem was with how the speakers treated the schwa within parts of speech (Table 9). According to Celce-Muria et al (2010), “One of the more striking characteristics of English is the frequency with which reduced vowels occur in the stream of speech” (p.131). One situation in which a vowel will occur in an unstressed position is when it is in “unstressed function words” (p.133). In the chart below (Table 9), it becomes clear that there is significant error most particularly with prepositions, and auxiliary verbs.

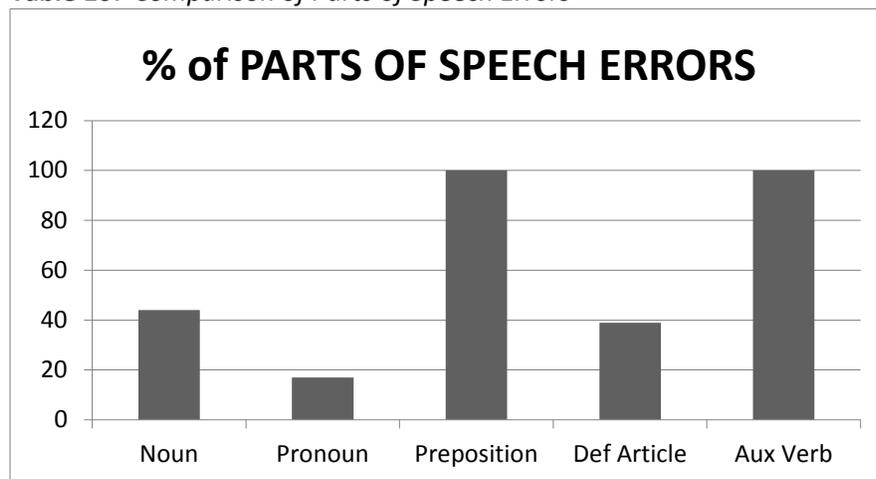
**Table 8:** Words using the Schwa and the Amharic Realizations

| <b>Form of the Word</b> | <b>Vowel Inventory</b> | <b>Vowel Inventory</b> |
|-------------------------|------------------------|------------------------|
| <Stella>                | [ə]                    | [a] [a] [ʌ]            |
| <her>                   | [ə]                    | [ɛ] [ɛ] [ɜ]            |
| <to>                    | [ə]                    | [u:] [u] [u]           |
| <her>                   | [ə]                    | [ɛ] [ɜ] [ɜ]            |
| <the>                   | [ə]                    | [ə] [ə] [ɛ]            |
| <of>                    | [ə]                    | [ɔ] [ɔ] [ɔ]            |
| <of>                    | [ə]                    | [ɔ] [ɔ] [ɔ]            |
| <a>                     | [ə]                    | [ɛ] [ɪ] [ə]            |
| <her>                   | [ə]                    | [ɛ] [ɜ] [ɜ]            |
| <brother>               | [ə]                    | [ɜ] [ɛ] [ə]            |
| <a>                     | [ə]                    | [ɔ] [ɪ] [ə]            |
| <a>                     | [ə]                    | [ɔ] [ə] [ə]            |
| <for>                   | [ə]                    | [ɔ̃] [ɔ] [ɔ]           |
| <the>                   | [ə]                    | [ɜ] [ə] [ɛ]            |
| <can>                   | [ə]                    | [ɛ] [a] [ɛ]            |
| <her>                   | [ə]                    | [ɜ] [ɜ] [ɛ]            |
| <the>                   | [ə]                    | [ə] [ə] [ə]            |
| <station>               | [ə]                    | [ɔ] [ə] [ə]            |

*Adapted from: The Vowel Project, Spring 2012*

**Table 9: Words and Parts of Speech that use the Schwa**

| Word                  | Part of Speech   | # of Tokens | # of Errors | % of Errors   |
|-----------------------|------------------|-------------|-------------|---------------|
| <b>NOUNS</b>          |                  |             |             |               |
| <Stella>              | noun             | 3           | 3           | 100.00        |
| <brother>             | noun             | 3           | 0           | 0.00          |
| <station>             | noun             | 3           | 1           | 33.00         |
| <b>TOTAL</b>          |                  | <b>9</b>    | <b>4</b>    | <b>44.00%</b> |
| <b>FUNCTION WORDS</b> |                  |             |             |               |
| <her>                 | pronoun          | 12          | 2           | 17.00         |
| <to>                  | preposition      | 3           | 3           | 100.00        |
| <of>                  | preposition      | 6           | 6           | 100.00        |
| <for>                 | preposition      | 3           | 3           | 100.00        |
| <a>                   | definite article | 9           | 5           | 56.00         |
| <the>                 | definite article | 9           | 2           | 22.00         |
| <can>                 | auxiliary verb   | 3           | 3           | 100.00        |
| <b>TOTAL</b>          |                  | <b>45</b>   | <b>24</b>   | <b>54.00%</b> |

**Table 10: Comparison of Parts of Speech Errors**

The implications of the errors in the vowels suggests that the Amharic speakers' difficulties with the reduced vowels is more tied to the problematic area of connected speech flow in English, and the development of stress and timing than it is with overall systematic difficulties with English vowels.

### 4.3 The Coda Condition

Just as the sonority sequencing principle has a rise between about 2-6, reaching a peak and then flowing downward, the Coda Condition creates the opposite effect for coda clusters (Yavas, p. 143). The peak of a syllable should be the nucleus (vowel) and then should drop on the closest consonant, with a continued drop until the last coda is reached in that syllable (Koffi, p. 138). The English language allows for up to 4 codas if /s/ is included as one of the consonants. Other languages, Amharic being one, do not allow for this same rule. However, Amharic does allow for a syllable combination of CVCC and VCC if the word is a verb, so there is precedence for allowable complex codas in the Amharic language (Sherwin, p. 4).

### 4.4 Amharic Coda Clusters and the Coda Condition

As is the case with the sonority sequencing principle, if the sonority does not fall through all codas in the syllable, the Coda Condition has been violated. The Amharic language does allow for certain coda clusters, so there would be the assumption that coda clusters might not pose as significant a problem to English learning than do the onset clusters.

There are a total of twelve words, 36 realizations, in the IPA transcription from GMU archives which have complex coda clusters, including four words which violate the coda condition. These four words include <six>, <slabs>, <kids> and <bags>. In all four instances, the sonority drops from the nucleus to the first consonant (coda), but then rises again with the second consonant (coda). I have included a breakdown (Table 11) of the words and the Amharic realizations of the twelve words:

**Table 11: Complex Coda Clusters and Amharic Realizations**

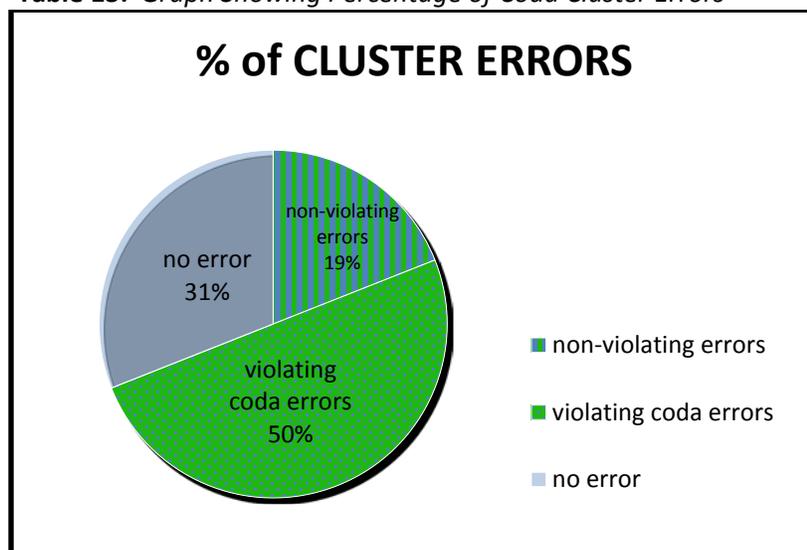
| Words       | Clusters | Occurrences | Amharic Realizations 10,11,12  |
|-------------|----------|-------------|--------------------------------|
| <ask>       | [sk]     | 1           | [ask] [ɑsk] [æskə]             |
| <bring>     | [ŋ]      | 1           | [bʌɪŋ] [bʌiŋ] [bʌiŋ]           |
| <things>    | [ŋz]     | 2           | [θɪŋ] [fɪŋz] [fɪŋz]            |
| <six>       | [ks]     | 1           | [sɪks] [sɪks] [sɪks]           |
| <spoons>    | [nz]     | 1           | [ɔspʊn] [ɪspʊns] [ɪspʊn]       |
| <slabs>     | [bz]     | 1           | [sleɒp] [slep] [ɪslɒps]        |
| <and>       | [nd]     | 2           | [æn] [end] [ɛn]                |
| <and>       | [nd]     | 2           | [ænd] [ɛn] [end]               |
| <kids>      | [dz]     | 1           | [kɪts] [kɪts] [kɪ:ts]          |
| <things>    | [ŋz]     | 2           | [tɪŋz] [fɪŋz] [fɪŋz]           |
| <bags>      | [gz]     | 2           | [bæg] [bæks] [baks]            |
| <Wednesday> | [nz]     | 2           | [wɪnzdeɪ] [wɪnstdeɪ] [wɛnstɛɪ] |

I then divided these words into two cluster types: non-violating coda clusters and violated coda clusters (Table 12) in an attempt to investigate if the Amharic speakers would have the same difficulties that they encountered in the onset complex clusters (note: this particular chart does not take into account errors caused between the devoicing of /s/, but just the coda condition violations):

**Table 12:** *Complex Codas by Cluster Type*

|                               | Cluster Type | # of Tokens | # of Errors | % of Errors in Word |
|-------------------------------|--------------|-------------|-------------|---------------------|
| <b>NON VIOLATING CLUSTERS</b> |              |             |             |                     |
|                               | [sk]         | 24          | 1           | 33.00               |
|                               | [ŋ]          | 24          | 0           | 0.00                |
|                               | [ŋz]         | 24          | 1           | 17.00               |
|                               | [nd]         | 24          | 3           | 50.00               |
|                               | [nz]         | 24          | 2           | 33.00               |
| <b>Total</b>                  |              | <b>24</b>   | <b>7</b>    | <b>29.00%</b>       |
| <b>VIOLATING CLUSTERS</b>     |              |             |             |                     |
|                               | [ks]         | 12          | 0           | 0.00                |
|                               | [bz]         | 12          | 2           | 67.00               |
|                               | [dz]         | 12          | 0           | 0.00                |
|                               | [gz]         | 12          | 1           | 33.00               |
| <b>Total</b>                  |              | <b>12</b>   | <b>3</b>    | <b>25.00%</b>       |

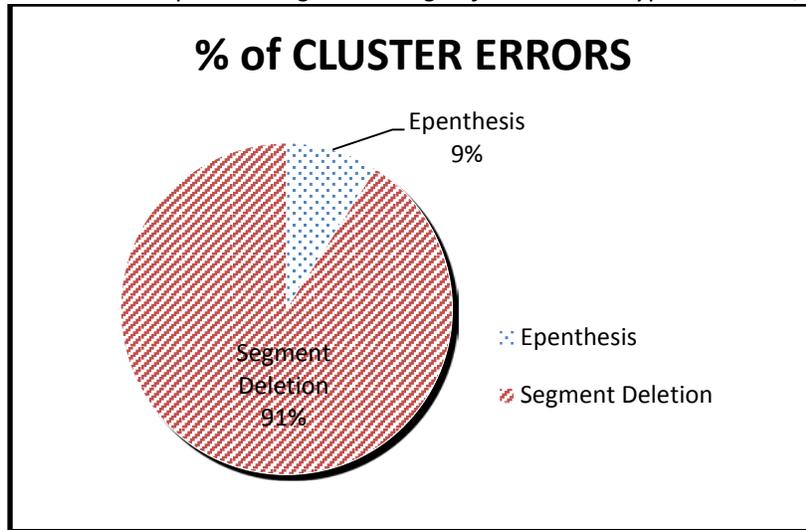
Similar to findings from other studies (Sherwin), my results did not indicate a large difference in pronunciation between non-violation coda conditions and violating coda conditions (Table 12). There was only a 4% differentiation between the two groups, which does not appear significant. However, when the coda clusters that had no errors were divided out (Table 13), the percentage of errors between the non-violating and violating coda clusters was more distinct:

**Table 13:** *Graph Showing Percentage of Coda Cluster Errors*

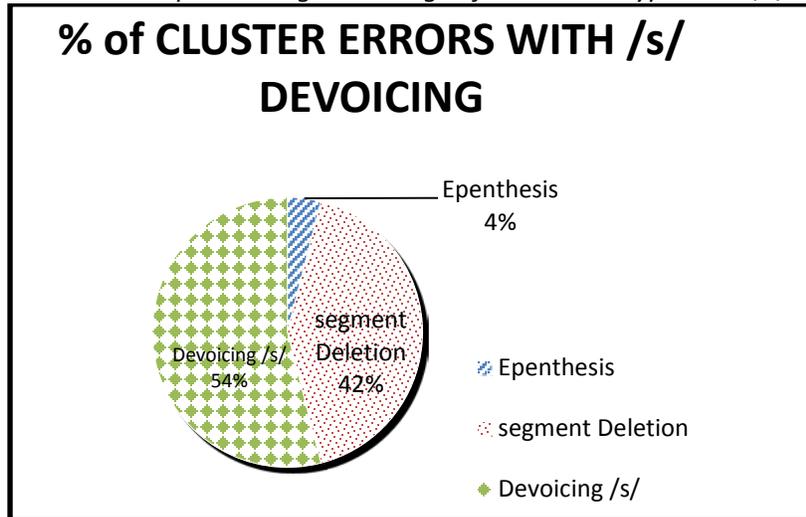
Particularly noticeable in the analysis were the types of cluster errors when clusters involving /s/ were separated out of the list (Table 15). These /s/ clusters included realizations with and without the devoicing of ending word /s/ errors. There were 11 structural coda cluster errors (an addition or deletion of a coda), with ten out of eleven indicating a drop of one of the consonant segments. However, there were an additional 13 incidences of coda errors that

involved /s/ devoicing in the final consonant position (codas did not change the structure, but just the pronunciation of one of the codas):

**Table 14:** Graph showing Percentage of Coda Error Types without /s/ devoicing



**Table 15:** Graph showing Percentage of Coda Error Types with /s/ devoicing



The most significant problem, percentage-wise, therefore appears to be in the realization in the sound of the error type of the consonant in the coda, primarily devoicing /s/ and deletion of a consonant segment.

Finally, of the twelve words, two are verbs (17%), <ask> and <bring> having only one error rate in the six realizations (17%). Since Amharic allows for complex coda clusters with verbs, it would make sense that there would be a relatively low error rate for English verbs with complex codas. Additionally, there are two instances of a conjunction <and> which has an error

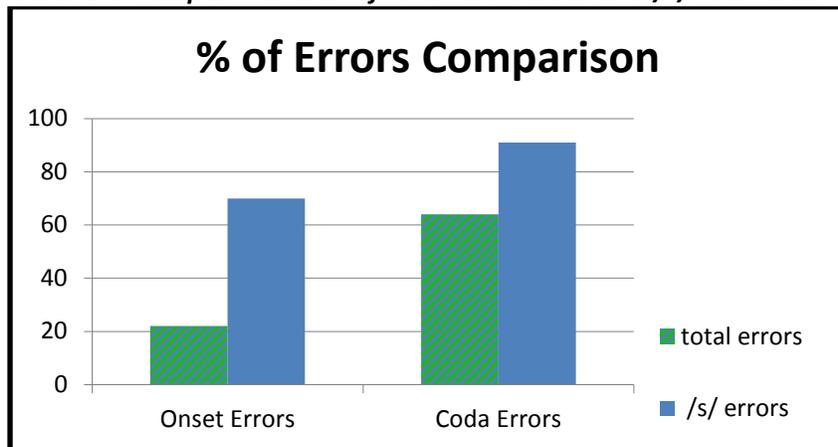
rate of 50%, and one adjective with no error. The remaining seven words are types of nouns. Of these, the error rate (including the devoicing /s/) was 20 out of 21 (95%). The total error rate for all non-verb words is 77%. It follows, therefore, that the Amharic learner would try to compensate in some manner for a non-verb complex coda by changing a feature of the words (devoicing the /s/ or segment deletion).

Within the scope of this paper's analysis, I conclude that complex coda consonant clusters do present challenges for Amharic speakers. It does not appear to be dependent upon whether the English word violates the Coda Condition, but is more dependent upon the type of coda cluster and part of speech. For English words with an /s/ in the final coda position, the Amharic speaker will compensate by devoicing the /s/ sound, or will drop the /s/ altogether from the word, thus eliminating the complex coda situation. As a side note, in the samples from the GMU text, the Amharic speakers also showed a propensity to drop the final coda segments when they encountered /d/ as well, but I do not have enough data to confirm the consistency of this situation to address properly in this paper.

## 5.0 Pedagogical Implications

There are pedagogical implications for the errors that the Amharic speakers make with regard to consonant clusters, in particular /s/ consonant clusters as shown in the table below:

**Table 16: Comparison chart of total errors with their /s/ consonant cluster**



In this study, ten out of twenty onset cluster words (50%) had /s/ clusters; whereas, eight out of twenty coda cluster words (67%) had /s/ clusters. This is not an equal comparison, but it does show that overall /s/ clusters in both areas were difficult for the Amharic speaker, as 70% of the onset cluster errors and 91% of the coda cluster errors were from /s/ clusters.

The primary difficulty that the ESL and ELL teachers need to be aware of, and make corrections to, are within English complex onset /s/ clusters—primarily the three that violate the SSP rule: /sk/, /sp/ and /st/. A natural tendency for the speakers in this study was resyllabification in which they added an extra vowel in front of the onset cluster to preserve the

English syllable structure and SSP rules. It is important to address this with the learners for a variety of reasons. First, there could be instances where the insertion of a vowel produces a completely different word, and this would hinder intelligibility. For example, *state* versus *estate*; *sleep* versus *asleep* and *steam* versus *esteem* (Celce-Murcia et al, p. 105). Second, using the strategy of epenthesis can interrupt the flow of speech and break the stream of the English sentence. A break down in the stress and rhythm of a sentence can cause the speaker to sound choppy and may impede the native English speaker from comprehending what the non-native speaker is saying. Teachers need to do some sort of noticing activities that bring the problem area to the attention of the speakers. The learners should be given listening discrimination exercises that focus primarily on the complex onset clusters that violate the SSP rule in English: /sk/, /sp/ and /st/ onset clusters, and then moving on to the other /s/ clusters such as /sl/ and /sn/ complex clusters. According to Celce-Murcia et al (2010), one listening discrimination exercise to help with noticing and pronunciation is extending the /ssssss/ sound out in words such as <scoop>, <stella> and <spoons> to practice speaking the sound without a vowel (p.105).

For coda clusters, teachers should be aware that for Amharic speakers the coda clusters that include a final-/s/ grouping need to have special attention paid to the pronunciation of the phonological sounds, because the speakers have a tendency to devoice the final /s/ sound. According to Koffi (2010), “The morphological rule dictates that the suffix <s> be pronounced [z] when it is added to a voiced segment, be it consonant or a vowel” (p. 144). The rule also states that the suffix <s> is pronounced as [s] after a voiceless segment (Celce-Murcia et al, p. 395). In this study, the two primary methods of error correction used by the Amharic speakers was the deletion of the final <s> or a devoicing of the final <s>, disregarding the English voicing/devoicing rules described above. (As a side note, the speakers also deleted <d> in the two words <and>, but since this was the only occurrence of [nd] coda ending, this study has no way to see if this deletion is common to all [nd] endings or just in this case. It may be that the speakers are attempting to use connected speech techniques such as linking.) Focus on words such as <Wednesday>, where the [s] and [z] are issues of accentedness is not a priority in teaching as this does not obstruct intelligibility. What is a priority, however, is that Amharic students are taught to retain an <s> at the end of plural words, because this is a situation where misunderstanding can occur. As Celce-Murcia et al (2010) state, “Third-person singular present tense and plural endings provide important grammatical signals and are never left off in order to simplify a cluster” by native English speakers, and so if the signal sounds are deleted, there could be a break down in communications. As determined by the three examples in this study, Amharic learners do not tend to have more difficulties with clusters that violate the coda condition, so this does not need to be a priority when teaching consonant coda clusters.

## ABOUT THE AUTHOR

Tonja Brown got her BA at SDSU with an emphasis in medieval literature and medieval history. While studying Old English during the undergraduate process, she became captivated with the historical development of the English language, and took numerous ESL classes for fun. In 2010, prior to entering the TESOL program at SCSU, Tonja achieved her MA in English at SCSU. She is currently teaching college ESL classes at SCSU while concurrently obtaining her MA in TESOL and Minnesota K-12 licensure in ESL. Her ultimate educational goal after licensure is to teach EFL in another country.

## Notes

\*All three speakers had difficulty with <three> as they changed /th/ to [t]. However, this did not appear to be a problem with onset cluster violations as much as difficulty pronouncing the sound. I did count the error made by speaker #10 who deleted the [r] in the onset cluster. The remaining two speakers left the cluster as [tr]. For the purpose of this paper, I did not count as violations of the SSP those changes the speakers made with lengthening of consonants, aspiration of consonants, nor the pronunciation of [r] to [ɹ].

## Appendix 1

### *Amharic Consonant Chart*

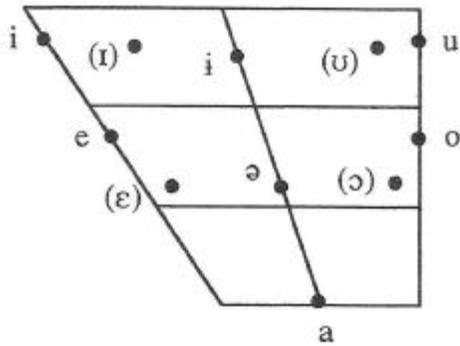
#### Consonants

|                     | Bilabial | Labio-dental | Alveolar | Post-alveolar | Palatal | Velar | Glottal | Labialized Velar              |
|---------------------|----------|--------------|----------|---------------|---------|-------|---------|-------------------------------|
| Plosive             | (p) b    |              | t d      |               |         | k g   |         | k <sup>w</sup> g <sup>w</sup> |
| Affricate           |          |              |          | tʃ dʒ         |         |       |         |                               |
| Nasal               | m        |              | n        |               | ɲ       |       |         |                               |
| Fricative           |          | f            | s z      | ʃ ʒ           |         |       | h       |                               |
| Tap/Trill           |          |              | r        |               |         |       |         |                               |
| Approximant         | w        |              |          |               | j       |       |         |                               |
| Lateral Approximant |          |              | l        |               |         |       |         |                               |
| Ejective Stop       | (p')     |              | t'       |               |         | k'    |         | k <sup>w'</sup>               |
| Ejective Affricate  |          |              |          | tʃ'           |         |       |         |                               |
| Ejective Fricative  |          |              | s'       |               |         |       |         |                               |

Additional labialized consonants: f<sup>w</sup>, b<sup>w</sup>, m<sup>w</sup>, p<sup>w'</sup>, t<sup>w'</sup>, h<sup>w</sup>

[http://sail.usc.edu/~lgoldste/General\\_Phonetics/Final\\_Project/Amharic.pdf](http://sail.usc.edu/~lgoldste/General_Phonetics/Final_Project/Amharic.pdf)

### *Amharic Vowel Chart:*



Note: vowels in parentheses are not independent phoneme rather allophones of the central vowels (p. 47) [http://sail.usc.edu/~lgoldste/General\\_Phonetics/Final\\_Project/Amharic.pdf](http://sail.usc.edu/~lgoldste/General_Phonetics/Final_Project/Amharic.pdf)

For interactive Amharic consonant & vowel experience, please see website:

[http://www.andrewbrotherton.com/languages/ipa/consonant\\_files/ipa\\_consonants\\_amharic\\_660pxwide.htm](http://www.andrewbrotherton.com/languages/ipa/consonant_files/ipa_consonants_amharic_660pxwide.htm)

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