

AN ANALYSIS OF SOMALI PRONUNCIATION ERRORS

by

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## CHAPTER ONE: INTRODUCTION

In my second year of teaching English as a second language (ESL), I started working with adolescent Somali immigrants at a middle school in a small school district in Minnesota. Because we had a great number of learners hailing from over twenty countries, we did not have a Somali interpreter, nor were any of the district's ESL teachers well versed in Somali culture. I had two beginning Somali students, but the majority were intermediate learners. Somalis made up a third of my intermediate English class. My students were generally patient with my ignorance of their language errors. While I was learning about the languages and cultures of my students, I realized each language group had unique challenges with English. I had a great deal to learn about the linguistic issues they faced, especially those students whose home languages were non-European such as the Arabic and Somali speakers.

My intermediate students had discernable accents, yet they were intelligible; however, reading and writing were challenging for all students. Within the first two months of school, one student in particular, "Fatuma," noticeably struggled with spelling. I was unable to comprehend her writing because she had a habit of using 'but' as a verb in her papers. I asked her to read a paper to me; when she read it, I realized that 'but' was actually 'put', a verb, not a conjunction. As soon as I switched 'p' and 'b' in her writing, I was able to understand her stories. Fatuma constantly confused 'p' and 'b' in

her writing. However, her errors were never consistent; sometimes she spelled words correctly with these letters. She might correctly use 'put' in one paper then spell it 'but' in her very next paper. Fatuma seemed to guess at which letter to use when she came upon the sounds. This was my first exposure to confusion between the phonemes /p/ and /b/ with Somalis.

Fatuma's spelling problem puzzled me; I had many questions about her. What caused her to have so many difficulties with these two letters? Why did not she consistently make the same errors? Were there other phonemes that caused problems for Somali learners? Part of my answer came later in the year when an Egyptian beginner asked me how to say 'p' in English. I asked if it was different in English than Arabic. She responded that there was no 'p' in Arabic and she had no idea how to make the sound. I knew that Arabic and Somali shared phonemes that did not exist in English, so I concluded that perhaps Somali did not have /p/ either. I asked the Somalis in my intermediate ESL class if they had /p/ in Somali and they told me it did not exist. Finally, Fatuma's spelling problem made sense to me. She was not hearing the distinction between the phonemes because the sounds are allophones in her first language. As a result she was unable to make the distinction between the letters in her writing and used the letters interchangeably.

Fatuma's problem was not entirely explained. She had two close Somali friends in class; however, the other girls did not make the same spelling errors in their writing as Fatuma. The friends had not been in the United States as long as Fatuma had. I asked

myself what was unique about her experience or the experiences of her friends. I wondered if it was difference in schooling or a disability. Fatuma's friends had lived in India and one spoke Urdu, the other, Hindi. The phoneme /p/ exists in both these languages; perhaps her friends learned the new phoneme while they lived in India. Fatuma, on the other hand, had been in a refugee camp before coming to America. She most likely did not have the same quality of education as her friends had experienced in India.

Over the past three years, I watched as the number of Somali newcomers increased twenty percent in my district (Minnesota Department of Education 2005). The new arrivals had less than two years formal education at best. I found understanding these students to be difficult. Occasionally, their speech was unintelligible to me. I noticed several phonemes that were mispronounced and consonant clusters that were modified through either deletion or epenthesis. I became concerned with issues of intelligibility, particularly because my Somali students are asking me how to find employment. Most of them are looking ahead to becoming productive members in American culture; on the whole, my students feel that there is little hope of being able to return to Somalia in the near future. They plan to continue their post-secondary education at American universities and to live in America as adults.

The new cultures Somalis are experiencing outside of their homeland are not necessarily negative. Somalis have experienced foreign linguistic influences within the confines of Somalia, European nations having had a presence there (Abdi 1998). The Somali public educational system of the twentieth century largely owes its organization

to the imperialist nations of Italy and Britain. Many well-educated Somalis are literate in one of these two European languages. Somalia has been culturally and religiously tied to Arabic-speaking nations of North Africa and the Middle East prior to the European presence. Somalia had a large number of religious schools, which were prevalent in rural areas. Somalis who attended these religious schools would learn Arabic and about the Muslim religion. The cultural ties with Arabic have influenced the Somali language; for example, in Somali the phoneme /x/ exists only in words borrowed from Arabic (Saeed 1999); it is not used in any words that are native to Somali.

#### Arabic Influence in Somalia

Somalis have had contact with Egypt and the Arabian Peninsula for centuries, perhaps dating back to the time of Prophet Mohamed (Farid and McMahan 2004). Historically, many groups from Asia, Africa and Europe have colonized Somalia. Somalia has been part of the Ottoman and Omani East Empires. It is religiously tied to other Muslim countries as the population is 99% Muslim (Minnesota Department of Human Rights 2005). Somalis have enjoyed trade and cultural ties with both Egypt and the Arabian peninsula; the Arabic language and Islam have been a large influence upon Somalis for centuries. Most men have Arabic personal names. Currently, Somalia is a member of the Arab League, an organization of Arabic countries. Despite the influence of Islam, Somalia does maintain a distinct culture apart from Arabic states and has a rich oral tradition.

Linguistically, Somalia is one of the few countries of Africa where nearly one hundred percent of the population speaks the same language: Somali. Somali has been the

official language of Somalia since 1972, when it became a written language. Prior to that, the official colonial languages of the Somali government were Italian in the South and English in the North. Arabic was also an official language due to Islamic ties dating to a pre-colonial era; its usage was scattered throughout the country. Somalis prayed in Arabic and many could read it as well. Somali has three distinct dialects (Saeed 1999). The Northern dialect is the standard and also somewhat misleading in its name. It is spoken in northern, western and southern parts of Somalia. Saeed infers that it became widespread due to clan migrations. This dialect is used most frequently by writers and politicians. The Benadir dialect is spoken along the coast of the Indian Ocean including Mogadishu, the capital of Somalia. These two dialects are fairly inter-comprehensible. The May dialect is spoken along the southern coast of Somalia and is incomprehensible to the other two major Somali dialects. May is rarely used in writing, so most speakers use the Northern dialect as a lingua franca to communicate with other Somali groups.

#### Somalis in America

After civil war erupted in the early 1990's, many Somalis fled to Kenya. The refugee generation frequently has had interruptions to their educations. Young Somalis have had to learn second or third languages in the country where their families sought refuge. There, children received little, if any, education in the camps. Those children who were educated in Kenya generally learned Swahili. Since the Somali government was racked by war in the infancy of the written Somali language, few Somalis actually learned how to read fluently in Somali. They did not have the luxury to pass literacy skills to their children while trying to survive as refugees of war.

Today most Somalis have found themselves among a second or third wave of migration where they are trying to learn literacy skills as adolescents and young adults. These young Somalis are finding themselves in Minnesota after having escaped Somalia and, in many cases, leaving a second state where refuge was originally sought. Many are trying to readjust to yet another language and educational system in a new country. Often they are the quickest to adapt in the family and frequently assist their older relatives in communicating. The challenge of learning English, adjusting to western culture, and interpreting for relatives presented to these children is daunting.

The concentration of Somalis in Minnesota, particularly the Twin Cities area, is greater than any other part of the country. Because so many of these immigrants cannot read or write fluently in any language, they will have to find jobs where they can use oral skills. Since so many Somalis are finding work in the service sector, it would be in our best interest as ESL instructors to assist this group with issues that affect pronunciation. I feel responsible to help my students become successful members of American society whatever their goals are. After watching Fatuma struggle with her 'p/b' spelling confusion, I became interested in learning why she frequently confused these two letters and how I could help her and other Somali learners with acquiring English. I wanted to know if there were other phonemes that could be problematic. My research questions developed from these questions.

I have three research questions that I intend to address. How do voice onset timing (VOT), vowel length and manner of articulation affect Somali pronunciation of English phonemes /p,b,t,d,f,v/? Does Somali pronunciation of these phonemes differ

from Standard English as described in literature? Do beginner and intermediate English language learners (ELLs) produce phonemes differently?

Several factors affect the phoneme that is ultimately produced by a speaker: vowel length, voice onset timing (VOT) and manner of articulation. Vowel length is defined as the length of time that a speaker produces a vowel sound. English speakers tend to slightly lengthen a vowel sound before a voiced stop as opposed to a voiceless stop (Celce-Murcia, Brinton, Goodwin 2004). Not making a distinction can actually make English listeners interpret a voiced sound as voiceless (Mitleb 1985). VOT shows when the vocal cords start to vibrate in anticipation of a voiced phoneme. This would prove whether a phoneme was voiced or voiceless. Manner of articulation is the way in which a speaker produces a sound. I also look at two fricatives in addition to stops because Somalis tend to articulate a word-medial stop as a fricative (Saeed 1999). A stop occurs when the air is stopped after articulating the phoneme. With a fricative, the airflow is pushed out of the lungs until the speaker articulates another phoneme or stops the flow word finally. I compare word-medial English stops with fricatives as produced by a Somali ELL. There appears to be little if any research on Somali pronunciation of English and there is a gap in literature pertaining to Somali ELLs.

In Chapter Two I look at a review of literature pertaining to phonological development in the target language. I review phonological challenges English learners face with English consonants. I complete a contrastive analysis of English and Somali consonants to determine where Somali ELLs might encounter difficulty with English phonological production. Finally, I discuss three studies that influenced methodology for

my study. In Chapter Three I outline the methodology of my study. I discuss the design, setting, triangulation, participants, and procedures. I analyze the data from my study in Chapter Four. I report the results and discuss the findings. In Chapter Five, I discuss dissemination, implications for teaching, and further research based on the study.

## CHAPTER TWO: LITERATURE REVIEW

I am studying Somali pronunciation of six phonemes because I want to discover which features could cause a Somali to be misunderstood by native speakers of English. I am looking to answer three questions with my research. How do voice onset timing, vowel length and manner of articulation affect Somali pronunciation of the English phonemes /p,b,t,d,f,v/? Does Somali pronunciation of these phonemes differ from Standard English as described in literature? Do beginner and intermediate ELLs produce phonemes differently? In the first chapter, I discussed my interest in helping my Somali students with the /p/ phoneme because it seems to be an ongoing issue with their pronunciation and it may lead to possible unintelligibility.

In this chapter, I examine the research on errors of pronunciation which may lead to unintelligibility because of interference from the native language. Secondly, I look at studies of stages of ELLs' pronunciation to analyze where issues may occur with voicing and to identify stages in the acquisition of pronunciation. Thirdly, because there is little, if any, research regarding Somali ELL pronunciation, I look at studies of Arabic, a prominent language that has a number of phonemic similarities to Somali. The fourth section compares phonemic differences between Somali and English in a contrastive analysis. Finally, I compare three studies on Hong Kong English relevant to my methodology. Through investigating the interference of native language on pronunciation

errors in a second language, Arabic consonant pronunciation problems in English, a contrastive analysis and studies on one particular English accent, I hope to gain a better understanding of the issues surrounding Somali pronunciation of English.

### Contrastive Analysis Hypothesis and Phonological Development

One area of second language acquisition (SLA) research looks at the ways in which second language errors are based on rules governing the first language (L1) of a speaker, which is referred to as interference. This interference causes the speaker to use constraints of her home language to produce sounds in the target language. Such errors are most pronounced in beginning learners who have not yet reset language constraints to the target language. An important aspect of SLA is the contrastive analysis hypothesis (CAH) (Eckman 1977). The CAH attempts to predict where language learners may encounter difficulty in the target language.

CAH and SLA are intimately linked to the idea of language universals. Certain principals or forms are 'universal' or known in every language, such as nouns, verbs and adjectives. A universal language challenge can involve the placement of phonemes within a word. For example, consonant clusters at the end of a word are difficult for humans to pronounce (English-speaking toddlers and ELLs face this challenge when pronouncing words like 'tasks'). A universally difficult phoneme placement is considered a marked phoneme (Greenberg 1966). Eckman (1977) suggests that if a learner encounters something that is more marked (challenging) in the target language than the corresponding feature in her native language, it will be difficult. The extent of the difficulty depends on how universally unusual the new aspect is.

Later research by Eckman, Elroy, and Iverson (2003) shows that phonemic problems for the language learner stem from three situations. In the first situation, neither phoneme in a minimal pair exists in the native language. A minimal pair is two words whose distinction hinges on a related feature within two phonemes, for example, 'bin' and 'pin'. In this case the voicing of the initial consonant provides the distinction. In the second situation, only one of the phonemes of a minimal pair exists in the learner's native language; it could be /b/ but not a /p/. The third case is that both sounds exist in the native language; however, they exist as allophones. In English we hear /p/ and /p<sup>h</sup>/ as allophones. The allophone /p<sup>h</sup>/ occurs word initially in 'pea'; /p/ occurs word finally in 'tap'. The two sounds will not be interchanged by a native speaker. Switching the distribution of each sound would cause a speaker to sound accented, but intelligibility wouldn't be hindered. In Hindi, /p<sup>h</sup>/ and /p/ are two distinct phonemes and interchanging them could lead to misunderstanding. Eckman et al (2003) found the last of the three, an allophonic split in the target language, to be the most difficult for language learners. Eckman et al found that language learners generally do well to expand first language schemata to learn a new target phoneme; that is, learners simply find a different way of classifying the new sound in their brains. With the allophonic split, most learners cannot hear the distinction between the two sounds. This poses a problem for a second language learner because their ear is not trained to hear the difference between the sounds. The ear needs to be retrained to hear a distinction between two sounds in order for them to produce the two distinct phonemes in the target language. Target language phonemes will

be most challenging to second language learners in instances where they are allophones in their native language (Eckman et al 2003).

Another area of analysis is stages of errors that ELLs make with pronunciation of English. Major (1994) worked with errors made with both initial and final consonant clusters with beginning and advanced Brazilian learners of English. He found that as learners advanced in English, they made fewer errors based on phonemic rules from Portuguese. His advanced subjects had fewer native language transfer errors and were able to substitute phonemes in a more target-like manner than his beginning subjects.

Eckman et al (2003) found that phonological development in English follows a set pattern of stages stemming from native language constraints and progressing to making a distinction between target language phonemes. The researchers illustrated the stages of acquisition using Korean learners. They looked at allophonic split and specifically chose Korean and Spanish subjects because allophones that exist in both Korean and Spanish are two distinct phonemes in English. Samples were elicited through pictures and a definition of the word in question.

Eckman et al (2003) suggest three stages of learning based on a distinction between basic and derived contexts for pronouncing phonemes. A basic context lacks an affix; their study used the pair 'she' and 'sea' as an example of a phonemic distinction in a basic context. A derived context involves an affix; their study used 'meshing' and 'messing' as an example of a phonemic distinction in a derived context. In the first stage, learners applied the native language rule in both derived and basic contexts, so that a Korean learner pronounced the pairs 'sea' and 'she' and 'messing' and 'meshing'

homophonously, as /ʃi/ and /meʃɪŋ/. In the second stage, learners made the contrast in basic contexts, pronouncing 'sea' and 'she' correctly but produced 'messing' and 'meshing' homophonously. In stage three, learners abandoned their native constraints in both derived and basic contexts, pronouncing all four words correctly.

#### ELL Interlanguage and Intelligibility

Another area of exploration consists of examining interlanguage pronunciation. Interlanguage is an emerging language system of a learner who is learning still using constraints of L1 and has not adopted constraints of L2 into their schemata (Selinker 1972). Eckman et al (2003), Archibald (1998), Major (1994), Lin (2001) and Tench (2003) isolate problems with phonemes and phonology with speakers of Chinese, Korean, Brazilian Portuguese, and Arabic. A number of issues affect ELLs' production of consonants. Eckman and Archibald discuss the difficulty of a native language allophonic pair becoming two distinct phonemes in the target language such as /l,r/ for Koreans. Major addresses stages of phonetic language acquisition; he looks at the changing interlanguage as Brazilians became more familiar with English. Lin looks at how formality of speaking tasks affects the oral errors of Chinese ELLs. Finally, Tench examines how well native English listeners' comprehend speech produced by Korean ELLs. While studies of Asian ELLs will not provide direct answers to problems Somalis might have, they can be instructive for finding phonemic issues.

In one such examination of intelligibility, Munro and Derwing (1995) study the connection between accent, pronunciation, and intelligibility; they conclude that accent does not make learners incomprehensible. The researchers recorded two English

speakers and ten Chinese speakers. English-speaking listeners rated both the Chinese ESL speakers and native English speakers by accent and transcribed what each speaker said. All subjects made phonemic errors, which caused words to sound non-native. The researchers found there was a significant correlation between accentedness and phonetic or phonemic errors. However, there was no significant correlation between accentedness and intelligibility nor errors and intelligibility. The listeners sometimes rated an utterance as strongly accented, yet they were able to transcribe it perfectly. Munro and Derwing's study shows that a strong foreign accent does not necessarily preclude intelligibility when speaking English.

A study by Mitleb (1985) contrasts the findings of Munro and Derwing. Mitleb studied ten Arabic ELLs' production of English phonemes /p,b,t,d,k,g,f,v,s,z/. The samples were played for eight native speakers of English to determine how well the ELLs produced English consonants. Listeners understood what was being said in most cases. However, one phonemic pair did cause unintelligibility. Listeners misperceived /b/ as /p/ in 24% of all cases. Mitleb determined that there is an intelligibility problem for the /p,b/ contrast of Arabic ELLs. Between the studies of Mitleb and Munro, further research is needed in perception analysis of ELLs.

After reviewing the research of both Munro and Mitleb, I wondered how my students would be understood by a native English listener. I normally do not have difficulty understanding my more advanced students; however, I frequently ask beginning Somali ELLs to clarify words with /p,b/. Based upon my own experience with

Somali newcomers, I imagine many of my beginning Somali learners would be misunderstood as were the Arabic ELLs in Mitleb's study. I hope to make a contribution to this area of research; the outcomes of my study might shed light on this argument.

An example of further research of ELL intelligibility, Chan and Li (2000) completed a review of literature and contrastive analysis of English and Cantonese, the dialect of Hong Kong. They specifically examined phonemic, phonological and suprasegmental differences between of English and Cantonese. Chan and Li sought to establish common mispronunciations with phonological systems that can harbor misunderstanding between a Hong Kong speaker and an English listener. Chinese ELLs often substituted a phoneme articulated in the same manner or changed the voicing if they could not produce the target. Speakers replaced a /θ/ with a /t/ or a /n/ with a /l/. Hong Kong English speakers' pronunciation of consonants and clusters tends to be difficult to predict according to the information that Chan and Li reviewed. The researchers also concluded that English vowel length and diphthongs are a problem for Hong Kong learners; ELLs tend to not make enough of a distinction between long and short vowels. Chan and Li felt more studies into intelligibility needed to take place.

I am interested to see if Somalis might make the same errors in their English pronunciation as the native Cantonese speakers did from the preceding study. Both Cantonese and Somali have simpler syllable structure (Saeed 1999) than English, so Somalis may replace difficult target consonants with a more familiar phoneme. I also wonder if beginning Somali learners will be able to lengthen and shorten English vowels because it posed difficulty for the Cantonese learners in the Chan and Li study. Somalis

may follow patterns similar to those of the Chinese and replace challenging English phonemes with ones that are more familiar.

In further research on intelligibility, Tench (2003) suggests that communication breakdown is not only production but perception of language as well. He states that there is a void in research in the area of receptive competence of ELLs, as researchers tend to focus on speaking abilities. In the study, twenty Korean university students listened to samples of native English speakers and transcribed the phonemes. While participants made occasional errors with initial consonants, final consonants caused more listener errors. He postulated that a reason for the difference in perception between initial and final consonants might be the lack of attention given to final phonemes. With most world languages an open syllable (one that ends with a vowel) is more common than a closed syllable (Celce-Murcia et al 2004). In addition Tench concludes that words out of context are always more difficult to perceive than those within a sentence.

I found this study interesting as for two reasons. The first being we often tend to rely on what our ELLs produce. Beginning Somali ELLs may not begin to recognize differences between English and Somali phonemes and therefore, ELLs will not produce them correctly. Secondly, given the universal preference for open syllables, Somali ELLs may have difficulty articulating word and syllable-final consonants as Tench's participants did.

These studies, although instructive for analyzing where potential phonemic issues might arise with regard to allophones, voicing, and stages of acquisition, do not apply to directly to ELLs of African descent. Asian ELLs have different phonemic constraints

than Africans. There are very few studies on African ELLs. However, there are a few studies on Arabic ELLs. Because Arabic and Somali share many phonemes, I examine this research for insight about how a Somali might pronounce English words.

#### Arabic Problems with English

One of the closest languages to Somali that has been researched by experts in second language acquisition is Arabic. Nearly all Somalis are Muslims, and therefore pray in Arabic; many have some literacy skills in Arabic as well. The first attempt to write Somali was an adaptation of Arabic script (Warsame 2001). Based on my own experience with native speakers of Arabic and Somali, some of their English errors are similar. Neither group has /p/ or /v/ in their language inventories. After looking at a few studies on Arabic speakers of English, I find that both Arabic and Somali speakers might share similar problems with stops.

Flege (1980 & 1981) conducted extensive research into Arabic ELLs' pronunciation of the English stops /p,b,t,d,k,g/ in his dissertation and subsequent studies; he was interested in the perception of accent in Arabs' English. He used a wavelength to determine the VOT in milliseconds of voiced and voiceless phonemes, vowel length, and aspiration differences between Arabic and English speakers. Each of these factors might influence a native English speaker perceiving an accent in an ELL's English. Flege recorded a group of Saudis who have been in America for more than two years, a group of Saudis who had been in America less than two years, and a native English speaker pronouncing the same words in English, and compared the results. He concluded that English listeners frequently hear Saudis' /p/ as /b/. The Saudi ELLs' /p/ VOTs were very

short and glottal pulsing occurred during the closure of the phoneme. Listeners were able to detect a distinction between /t,d/ and /k,g/ because the VOTs of these phonemes were closer to English values. The group of Saudis who had been in America for longer than two years were approximating phonetic norms of English whereas the group that had been in America less than a year still produced sounds close to Arabic.

Like Flege's studies, Moustafa (1979) and Mitleb (1985) both studied Arabic speakers' production and perception of English consonants. Mitleb focused on the same phonemes as Flege, but added /s,z,f,v/. Mitleb was less interested in the logistics of phonemic production and focused more on what native English speakers perceived to be intelligible utterances. Eight English speakers rated the errors of 10 Arabic speakers. Of all the pairs, English listeners had the most difficulty distinguishing the difference between /p,b/ than any other pair of consonants even when the speaker's attention was knowingly directed to the final consonant. Mitleb, like Flege, concludes that Arabic speakers make no distinction between the length of vowels occurring before final voiced and voiceless stops. It would be interesting to see if Somalis are able to produce a distinction in vowel length prior to word-final stops. Native English speakers lengthen the vowel before a voiced stop (compare the /æ/ in 'pat' and 'pad'). Therefore, English speakers will expect to hear a difference in vowel length depending on whether a final stop is voiced or voiceless. Because the Saudis did not lengthen or shorten the vowel, he concluded that this differentiation in vowels causes English-speaking listeners to

understand the final consonant as voiced, instead of voiceless, /kit/ would be perceived as /kɪd/.

Moustafa (1979) looked at the full range of English obstruents, /p,b,t,d,k,g,f,v,θ,ð,s,z,ʃ,ʒ,tʃ,dʒ/, using Egyptian learners. She was interested in Egyptians' perceptions of spoken English. Twenty subjects listened to a native English speaker say a pair of words. The subjects determined if the pairs had like or unlike phonemes. The data was analyzed with phonemes in initial, medial and final positions. Moustafa assumed that /p,b/ and /f,v/ distinctions would be difficult for Egyptians to perceive because one of the phonemes in each pair is not in the phonemic inventory of Arabic. She found that if /ð/ was in the same environment as /t/, Arabic listeners often mistook it for /d/. This result was unexpected as /ð/ exists only in classical or literary Arabic. She found that the contrastive analysis hypothesis could not always predict the difficulty that learners encountered in the target language.

Flege, Mitleb, and Moustafa all find that native English listeners had difficulty distinguishing the difference of Arabic ELLs' /p,b/ phonemes in English. Arabic ELLs struggle with English values for VOT, vowel length, and glottal pulsing for these two phonemes. Native English listeners misunderstand /b/ for /p/ when produced by Arabic speakers.

In this section I reviewed literature pertaining to interlanguage that ELLs produce before they reset their phonetic schemata to English patterns. ELLs frequently substitute

familiar phonemes from L1 for challenging phonemes in L2. From studies of Arabic speakers, I found that English phonemes /p,b/ and vowel length are challenging for ELLs. However, due to differences between Arabic and Somali, there may be other issues that may arise for the Somali ELL, so next I look at some of the phonemic differences between English and Somali in a contrastive analysis. I attempt to identify phonemes which exist in English but not Somali. These phonemes will become the focal point of my study.

#### Contrastive Analysis: English and Somali

Since there is a gap in phonemic analyses of Somali ELLs, I start with a contrastive analysis to identify where differences exist between English and Somali. A phonemic contrastive analysis attempts to predict where possible difficulties for a Somali ELL speaker might arise based on inventories of both languages. With further research, three other factors governing consonant production become pertinent to my study: manner of articulation, voicing and phonemic distribution. Manner of articulation refers to the airflow type when a consonant is produced. Speakers can create constant friction with a fricative such as /z/. Speakers can create a burst with airflow as with stop such as /b/. Voicing is the vibration or lack thereof of vocal cords. Vocal cords vibrate when producing /b/, a voiced consonant. Vocal cords do not vibrate when producing /p/, a voiceless consonant. Distribution refers to the position of a phoneme within a word based on constraints of a language. The consonant in English /p/ can occur in English in word-initially as in 'pea'. It can occur medially as in 'pepper'. It occurs word-finally in 'cap'.

Table 1 lists English and Somali consonants. Most of the information on Somali phonology came from Saeed (1999).

Table 1: Overview of English and Somali Consonants<sup>1</sup>

Method of Articulation	Bilabial	Labio-dental	Dental	Alveolar	Retroflex	Palatal	Velar	Glottal	Uvular	Pharyngeal
<b>Stops</b>										
E	p			t			k	ʔ		
S	b			t	ɖ		k	ʔ	g	
				d			g			
<b>Fricatives</b>										
E		f	v	θ	ð	s	z			
S		f				s		h		
						ʃ	ʒ		ħ	ʕ
						ʃ		h	χ	ħ
<b>Affricates</b>										
E						tʃ	dʒ			
S						tʃ				
<b>Nasals</b>										
E	m									
S	m			n			ŋ			
				n						
<b>Trill</b>										
S					r					
<b>Laterals</b>										
E				l						
S				l						
<b>Approximates</b>										
E	w							y		
S	w				r			y		

<sup>1</sup> E represents English phoneme; S represents Somali phonemes.

## Consonants

### Manner of Articulation

Stops. The distribution pattern governing stops in English and Somali differ greatly, so English stops could be difficult for Somali ELLs. Stops, or plosives, occur when the airflow is blocked before it is released. English has 6 common oral stops: /p,b,t,d,k,g/. These phonemes can occur in words in initial, medial and final positions of English words, as in the word ‘tag’. Additionally, English has a glottal stop /ʔ/ as in the negative ‘uhuh’ /ʔʌʔʌ/ or ‘kitten’ /kɪʔn/, where the movement of air through the throat stops for a moment. Glottal stops occur most frequently in initial and medial positions of English words.

Somali has 6 of the 7 English stops; /p/ does not exist in Somali. In addition to the stops shared with English, Somali also has /ɢ/, a voiced or voiceless uvular stop. Pronouncing /ɢ/ either voiced or voiceless is correct. The Somali distribution of stops is very different from English. The voiced sounds /b,d,g/ as in ‘bull’, *dibi* /dibi/, tend to lose voicing both word-initially and word-finally and resemble their voiceless pairs /p,t,k/. Moreover, /b,d/ weaken to a corresponding fricative medially. The sound /b/ becomes /β/ as in ‘ten’, *toban* /tɔβan/; /d/ changes to /ð/ as in ‘sheep’, *ido* /iðɔ/. The phoneme /g/ is the only voiced plosive that does not have a fricative allophone word-medially. The Somali phoneme, /ɢ/, follows the same distribution and weakening as

/b,d/. The voiceless phonemes /t,k/ occur only at the beginning of a syllable and are aspirated as in English. Neither phoneme weakens to a fricative word-medially. The glottal stop /ʔ/ is used in vowel-initial syllables. It comes just before the onset of the vowel; it gives a consonant to the vowel as in the Somali word for ‘cloth’: *or* /ʔor/. It is also inserted between two adjacent vowels and following a word-final vowel. The voiced retroflex stop, /ɖ/, written as *dh*, is pronounced as a flap /ɾ/ between vowels in the Northern dialects as in ‘to close’ *xidh* /hiɖ/. In Southern Somali varieties, *dh* is pronounced as a rolled /r/ at the medial and final position of a word as with /hir/. The exception to this rule being where the long consonant *dhdh* is used in the Northern Standards; *cadhdho* /ʕæɖɔ/ ‘scabies’ is pronounced identically in either standard.

Fricatives. Both Somali and English have a large number of fricatives. A fricative occurs when air is pushed past the two articulating organs creating consonant friction. The friction can be maintained as long as air continues to flow through the oral cavity. English has 9 fricatives /f,v,θ,ð,s,z,ʃ,ʒ,h/. English fricatives occur in all positions of a word as in ‘voiced’ and ‘beige’.

Somali has 7 fricatives; /f,s,ʃ,h/ are shared with English. These four phonemes are found in all positions within a Somali word. Somali has three additional fricatives which are articulated in the back of the oral cavity. The phoneme /χ/, a voiceless uvular fricative, is only found in loan words from Arabic as in ‘sheikh’ *shiiq* /ʃhr:χ/. The

phoneme /h/ is a voiceless pharyngeal fricative as in ‘chief’, *madax* /maðah/; /ʕ/ is its voiced counterpart, as in ‘drink’, *cab* /ʕab/. Somali fricatives do not have the same distribution constraints that Somali stops have. All fricatives can occur in words initially, medially, or finally. The fricative /ʕ/ retains voicing in all word positions. Voicing varies with /h/; word-initially and finally, it is voiceless. If it is found medially as in *duhur*, /duhur/ ‘noon’, it is voiced.

Affricates. Affricates are a combination of stop and fricative. The air is built up then released through a narrow passage creating some friction. Affricates are not very common in either English or Somali. English has two affricates /tʃ,dʒ/. Affricates can occur in all positions of a word in English as in ‘child’, ‘judging’, and ‘peach’. Somali has one affricate, /tʃ/ as in ‘bag’ *kiish* /ki:ʃ/. The Somali affricate is a phoneme with two allophones containing English phonemes /tʃ,dʒ/. The dialect determines which of the variations of the allophone are used. For Somali words, the affricate is used in the beginning of syllables. In words borrowed from Arabic, it occurs syllable finally.

Nasals. English nasals have a greater distribution than Somali; this feature might cause some difficulty for the beginning ELL. Nasals are articulated when the oral cavity is closed and the air is pushed into the nasal cavity. English has three nasals /m,n,ŋ/. /m,n/ can occur anywhere within an English word as in ‘mama’ and ‘noon’. /ŋ/ occurs word-finally as in ‘sing’ /sɪŋ/.

Somali has two nasals /m,n/. The first, /m/ occurs in Somali word initially or medially, never word finally. The root for all Somali words relating to ‘man’ is *nim*, but since /m/ cannot take a final position of a word, ‘man’ is spelled *nin* and pronounced /nm/. The phoneme /n/ occurs word initially, medially and finally. At the end of a syllable, /n/ can be colored to resemble the vowel that precedes it. Following a long vowel, /n/ is shortened and devoiced. After a short vowel, /n/ is longer and more pronounced. The English nasal /ŋ/ is not a Somali phoneme; therefore, beginning ELLs might simplify it to /n/.

Approximants and Other Consonants. Approximants should not present difficulties for Somali ELLs. Approximants are sounds produced with little obstruction from oral organs. Approximants are subdivided into two categories: liquids and semivowels. English has two approximants in each subcategory. The phonemes, /r,l/ are liquids as found in ‘roll’; /y,w/ are semivowels as in ‘yellow’. Approximants occur in any position of an English word.

Somali has the four English approximants /r,l,y,w/. Somali /r/ is trilled so that the tongue taps or vibrates against the alveolar ridge. The liquids /r,l/ occur in all positions of a word in Somali. Both semivowels /w,y/ function as independent consonants in syllable onsets or tied to a vowel in a diphthong

## Vowels

Vowels can be described as the peak of a syllable. The vocal cords vibrate continuously when they are produced. Vowels are classified according to heights and positions of the tongue in the mouth. In addition to the eleven ‘pure’ vowels, English contains three diphthongs where the tongue has to move to in order to produce the two non-adjacent sounds.

Somali has ten vowels which are divided into ‘front’ and ‘back’ series depending on where articulation occurs within the oral cavity. For every ‘pure vowel’ in Somali, there is a corresponding diphthong as well. Each vowel has both a long and short version. Very little changes in quality of the vowel between long and short sounds; vowel length is orthographically represented by doubling the vowel. Long and short sounds do constitute minimal pairs. *Tag* ‘go’ /taɡ/ and *taag* ‘strength’ /ta:g/ are distinguishable due to the length of the vowel. Vowels should not cause Somali ELLs difficulty.

### Potential Pronunciation Issues for Somali ELLs

Based on the contrastive analysis, one cannot assume that Somalis ELLs will struggle with all English-specific phonemic constraints. As Eckman et al (2003) suggest, second language phonemic acquisition comes in stages. Two distinct phonemic issues will challenge a Somali ELL. In the first of these, half of a target language pair exists in the native language, as with English /s,z/. Of this pair, only /s/ is a Somali phoneme. A Somali ELL must learn how to voice /z/. The second situation is an allophonic split. Two sounds are considered allophones of the same phoneme in Somali, but in English they are

two separate phonemes, as with /p,b/. In this study, I analyze which English phonemes might give Somali learners the most difficulty in English using Eckman's criteria.

With regard to English consonants /f,v,s,z,ʃ,ʒ/, one can see that Somali does not have all six in its phonemic inventory. In fact, Somali has just the voiceless sounds, /f,s,ʃ/, in each voiced-voiceless pair. Somalis know how to articulate all six of these phonemes. Somali ELLs may encounter difficulty voicing the phonemes. They have to learn to vibrate vocal cords to produce the voiced sound. It is easier to maintain the airflow for a voiceless fricative than to add voicing as well. It might take some time to get used to the sound and production of these voiced consonants, but this should pose fewer difficulties than the following allophonic split.

The allophonic split may prove to be much more challenging to Somalis. Somali has three pairs of allophones which are distinct English phonemes: /p,b/, /f,v/, and /tʃ,dʒ/. In Somali each of the sounds is used in a specific placement within a word. Initially and finally /b/ is devoiced, so it resembles an English /p/. Somalis pronounce *hilib* 'meat' as /hilip/. That means a beginning Somali speaker might be trying to say 'tab' according to rules of her home language. A native English listener might interpret it as 'tap'. The phoneme /p/ presents a challenge to my students. Voiceless /f/ is a Somali phoneme and voiced /v/ is not. A beginning ELL would probably produce /f/ instead of /v/. However, the voicing distinction between the two phonemes of this fricative pair /f,v/ is generally not as dissimilar as a pair of stops might be. Fricative voicing is sometimes very light,

even by a native English speaker. The Somali speaker might not be as likely to be misunderstood when producing a fricative. The third allophone /tʃ,dʒ/ has no set distribution as to which one is employed in specific environments. The Somali dialect governs where each sound is used (Saeed 1999). Therefore, with no set distribution constraints, predicting challenges is difficult for the researcher. These three phonetic pairs should prove to be the most challenging aspects of pronouncing English.

English vowels should not be problematic for Somali ELLs in the way consonants are. The Somali front and back vowels series are more marked than English vowels (Saeed 1999). The one aspect that might cause an issue for a Somali speaker is learning the English pattern of lengthening a vowel before a voiced final stop or fricative. Native English listeners rely more heavily on the length of the vowel than on voicing the final consonant to distinguish the difference between /pi:s/ 'peace' and /pi:z/ 'peas' (Celce-Murcia, Brinton, Goodwin 2004). Like English, Somali has long and short vowels. Somali vowels occur more frequently than English vowels because Somali has a simpler syllable structure than English and lacks consonant clusters. Given the similarity of vowels in English and Somali, vowels should not be as problematic as consonants for Somali ELLs.

After completing the contrastive analysis, I extrapolate the phonemes which might be the most challenging for a Somali ELL. The current study focuses on two of the three allophone pairs, /p,b/ and /f,v/, which cause Somali ELLs difficulty. After selecting the two test pairs, a 'control' group is needed to compare the transfer of this known pair

between Somali and English. Ideas for the control group were taken from literature on Arabic. Research by Flege (1980) and Mitleb (1979) shows that English listeners often mishear Arabic ELLs due to stop differences in the VOT and vowel length. VOT and vowel length could be a factor with Somali ELLs as well. I selected /t,d/ to be the control group, and looked for an appropriate design to get the timing and sets of samples. Three studies in particular have aspects that would apply to an analysis of Somali phonemic errors.

#### Studies Related to Methodology

While designing the study, I reviewed literature for studies that may provide guidance on my methodology. Three studies were particularly applicable: two analyzing the intelligibility of the accent of Hong Kong English speakers (Hung 2000 and Stibbard 2004), and one analyzing Arabic speakers (Flege 1980). These researchers analyzed VOT and vowel length to determine differences between standard and ELL English. The two Hong Kong studies are applicable because Cantonese (the dialect of Hong Kong) lacks many English phonemes and has a much simpler syllable structure than English. The Arabic study is useful because of similarities between Arabic and Somali. Some of the phonemic issues Arabic ELLs have might apply to Somali speakers also. These studies provide direction on designing my experiment and compiling the information on Somali pronunciation errors.

The first Hong Kong study, (Hung 2000) attempts to establish a pronunciation norm for phonemes in different positions of an English word by Hong Kong ELLs. Hung's focus is twofold: to inventory phonemes in the variety and to examine variations

in pronunciation based on phonemic placement within a word. Hung had 15 undergraduates read lists of randomly placed minimal pairs. He elicited key English phonetic contrasts that are problematic for Hong Kong speakers of English. He found that Hong Kong English speakers display a smaller phonemic inventory, a lack of vowel length contrasts, and a lack of fricative voicing contrasts.

Based on my contrastive analysis, some of the same issues that cause difficulty for Hong Kong speakers might apply to Somali ELLs as well. Neither Cantonese nor Somali have /v/ in their phonemic inventories. Cantonese, like Somali, has devoiced ‘voiced’ stops that are distinguishable from voiceless stops by voice onset timing (VOT). Hung’s Cantonese speakers did not make a perceptible distinction in English length contrasts between voiced and voiceless final consonants. Somalis have long and short vowel sounds, but they may not have the vowel length contrast before final consonants. Hung’s word list was an efficient method of eliciting specific target phonemes.

While Hung’s study serves as a starting point for methodology, I am critical of his choice to gather data solely with lists of minimal pairs. Granted, word lists are efficient and a researcher is able to control the phonemes and distributions as she sees fit. However, when reading lists aloud, speakers tend to pay careful attention to pronunciation. Conversations provide a more authentic assessment of participants’ typical pronunciation and errors. Moreover, a guided conversation or story retell can elicit specific target phonemes.

With these considerations in mind, I analyzed a second study of phonemic errors by speakers of Hong Kong English. Stibbard (2004) suggests that previous researchers of

Hong Kong English (HKE) look at phonemic errors in isolation. He analyzes co-occurring phonemic errors within words involving place of articulation. He used two interactive information-giving tasks and a story retell to obtain speech samples of seventeen undergraduate subjects. Stibbard's participants made a variety of errors for each target word; 'bridge' was pronounced as beach /bitʃ/, bitch /bitʃ/, and peach /pitʃ/. Out of context the participants would be misunderstood. Stibbard concludes since there are many possibilities for mispronunciation within one word, there cannot be a Standard English of Hong Kong.

Stibbard's study focuses on errors made by manner of articulation. It is influential because Somalis may turn medial stops into fricatives and devoice initial/final voiced stops within the same words based on their native language constraints. Using both methods of data collection appears applicable as Hung and Stibbard had opposing conclusions to their studies. Hung used word lists and Stibbard uses authentic speech samples. Stibbard's main criticism was that Hung sought isolated phonemic errors and he collected data with word lists. Stibbard's methodology produced dramatically different results. He found no stability of phonemic errors, in sharp contrast to the findings of Hung. Due to the stark contrasts of the findings of both Hung and Stibbard, I used both a word list with a story retell in the methodology.

The final study which influenced my methodology is an examination of stops pronounced by Arabic learners of English. Flege (1980, 1981) compares voiced/voiceless pairs of phonemes in words pronounced by Saudi speakers in both Arabic and English.

He looked at the duration of vowels and stops, voice-onset time and glottal pulse<sup>2</sup>. These factors may vary between languages even when the speaker is producing the same phoneme. These differences might cause target language listeners to perceive an accent or diminished intelligibility from a foreign speaker. Flege studied two groups of Arabic speakers (distinguished by length of time they had spent in the US) plus a group of Americans to use as a control; each group had six participants. The participants read CVC (consonant, vowel, consonant) words from a list; analyses were made with a spectrogram. Flege found that problems of intelligibility were only partially caused by mispronunciation of phonemes that do not exist in Arabic. The other issues with pronunciation lay in the fact that Arabic speakers did not lengthen the vowel before voiced final stops as native English speakers do. The Americans in Flege's study kept the closure intervals free of glottal pulsing when pronouncing /p,t,k/. In contrast, both Saudi groups produced glottal pulsing with the same phonemes. The Saudis shortened VOTs on English stops closer to the VOT norms of Arabic. In the case of /p/, an allophone of /b/ in Arabic, Flege showed that Saudis understood a /p/ is a voiceless /b/ and tried to articulate it as such, even though American listeners often heard a final /b/ where a /p/ exists in English (1980). With each task, Flege found that the more experienced Saudi speakers of English were able to better approximate English norms than the less experienced group. Flege's goal was to explain how native language transfer influences

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<sup>2</sup> The voicing or lack thereof during the closure interval of a stop. It often distinguishes the difference between voiced and voiceless stops.

production of target language sounds and the way they are perceived by a native speaker of the target language.

Flege's research influences the current study for three reasons. First, he studies Arabic speakers. Arabic is similar to Somali in several ways. Arabic has given Somali loan words, and both languages lack /p/. Secondly, he seeks to distinguish linguistic timing differences that lead to misunderstanding in a target language. Helping students communicate more effectively in English is a goal I have as an ESL Teacher. Thirdly, Flege's methods include examining VOT differences of Saudi ELLs to see if they are better able to approximate native speakers over time. The timing of stops is a method of examining if Somali ELLs are able to approximate timing of native English speakers.

These three studies influenced the design of my research methodology. Word lists were included to elicit specific phonemes. Conversational pronunciation was used to gather an authentic speaking sample. Finally, VOT and vowel length were analyzed as in the Flege study. In the current study VOT, vowel length and manner of articulation were examined in speech samples of Somali and English to discover how students from beginning to intermediate learners produce phonemes in Somali and English.

In this chapter, I discussed studies that influence my research questions: How do voice onset timing (VOT), vowel length, and manner of articulation affect Somali pronunciation of the English phonemes /p,b,t,d,f,v/? Does Somali pronunciation of these phonemes differ from Standard English as described in literature? Do beginner and intermediate ELLs produce phonemes differently? I discussed second language acquisition and stages of second language adaptation. I found there was a large amount of

research where English language learners' pronunciation is examined in stages of phonological development. However, most studies center on Asian, European ELLs and learners from the Americas; there is a gap in research with learners who speak Arabic or African languages. I focused on Arabic studies due to some phonemic similarities with Somali to get ideas for issues Somali ELLs may have. In my contrastive analysis, I examined how /p,v/ might be a potential issue for Somali ELLs because neither phoneme exists in Somali as a starting point for specific Somali and English phonemic differences. Finally, I discussed three studies which influence my methodology: two on Hong Kong English and one on Arabic English. In looking at three specific studies influencing my methodology, I found that although a word list may be artificial, specific phonemes can be examined in different positions throughout a word. In Stibbard's study a dialogue or story made it more difficult to isolate specific phonemes, but the speech is more authentic than in reading a word list. Flege found that in order to start to discuss accent and interlanguage by Arabic ELLs, a researcher must first gather data production in the native language. In Chapter Three, I outline my research design and methodology.

### CHAPTER THREE: METHODOLOGY

I am wondering if there is a difference in production of the phonemes /p,b,t,d,f,v/ in Somali and in English when a Somali ELL speaks each language. I would like to know if Somali ELLs produce phonemes in English as a native speaker would. Finally, I would also like to discover which of these phonemes are difficult for beginning ELLs and which phonemes become easier when a Somali ELL gains more oral proficiency in English.

In Chapter Two, I looked at language universals and stages of language acquisition. In addition, I examined general problems of Asian and Arabic ELLs with English pronunciation. I compiled a contrastive analysis of Somali and English phonemes to anticipate areas where Somali learners might encounter pronunciation problems in English. Finally, I evaluated three studies relating to Chinese and Arabic speakers of English, which influenced my selection of phonemes, features to study, and tasks. In this chapter I describe my selection of the phonemes /p,b,t,d,f,v/, research design, setting, participants, technology, and data collection. I also cover additional considerations which may influence the study and outcome of my research.

The emphasis of this study is learning whether the absence of two English phonemes in Somali causes problems for the Somali ELL. The study focuses on the pronunciation of /b,p,d,t,f,v/ by Somali ELLs. The phonemes /p,v/ do not exist in

Somali; I want to see if the phonemes were pronounced as /b,f/, the voiced and voiceless counterparts to /p,v/, or if the subjects make a slight distinction between each voiced/voiceless pair. As a control, the phonemes /t,d/, are used since both phonemes exist in Somali. The analysis also focuses on the distinction made between stops and fricatives within different positions of the word.

Three elements are considered in the analysis of the phonemic production. The first factor, VOT, is the interval between the release and voice of a stop phoneme; it is measured in milliseconds. In English VOT varies depending on aspiration, stress and position within a word. An initial /b/ is generally around 15 milliseconds (ms) and initial /p/ is closer to 55 ms (Ladefoged 2001). The second factor, vowel length, is measured in milliseconds like VOT. A native English speaker lengthens the vowel that precedes a voiced stop or affricate (Celce-Murcia et al 2004). The final factor for consideration is the manner of articulation. With a stop, a speaker stops the air that passes through the oral cavity, whereas, a speaker articulates fricatives with a steady stream of air passing through the cavity that continues into the following phoneme. Somalis articulate medial stops as fricatives in some cases. It was important to see if beginning students transferred Somali pronunciation rules to English. Finally, to see if Somali speakers made a difference in production of phonemes between Somali and English, participants produced words in both English and Somali. VOT and vowel length are examined to determine if there are any differences in production of phonemes between the two languages.

### Paradigm

A quasi-experimental design allowed for gathering and comparing of several different types of data (Brown & Rodgers 2004). This type of design let the researcher collect data for two different groups and analyze a number of variables within a uniform setting. The research questions for this study asked how certain factors, VOT, vowel length, and manner of articulation, affected production of six English phonemes, and how these target phonemes differed between Somali and English. For each of the three factors, data was gathered to find a mean and standard deviation. The means were compared for the variables: ELLs' English samples to standard English samples as defined by literature, beginning to intermediate ELLs, and ELLs' Somali samples to ELLs' English samples. The design differed from traditional quasi-experimental designs because it did not involve a treatment or learning strategy on to test on two groups of participants. It did allow for examination of how two different groups responded to a set of phonemic data.

My three research questions deal with comparing two sets of data for each question, so a quasi-experimental design allowed me to efficiently collect and compare a large amount of data in one interview with each participant. I needed data from each participant in both English and Somali to compare the differences between phonemic production in each language. I needed to compare Somali ELLs' English speaking samples to compare how they were similar to or differed from those that a native English speaker might produce. Finally, I needed to compare samples of beginning and intermediate Somali ELLs to compare and contrast their English speaking samples in

order to analyze which phonemes were easy to produce in both languages and which phonemes proved to be problematic to produce.

### Design

The first aspect of the research looks at how ELLs' samples differ from Standard English. Similarities will allow the researcher to understand what aspects of the six phonemes transfer easily for Somali ELLs. Differences between the two groups of data help predict where Somali ELLs might struggle with English. This information can be used to assist ESL teachers in deciding what part of phonetics to teach Somali ELLs explicitly.

The second factor in this study is the level of the participant. A comparison of beginners to intermediates shows what aspects are most challenging by looking at how beginners produce VOT, vowel length, and manner of articulation. It also demonstrates what is learned relatively easily by intermediates using existing teaching methods. Problems with intermediates' English production indicate an aspect of English phonetics that might need explicit instruction for Somali ELLs due to continued pronunciation problems or misunderstanding. The data provide a snapshot in time. The comparison between different levels accounts for progression in language learning and accent reduction.

The final factor is the comparison of ELL Somali and ELL English samples. This variable allows the researcher to compare the differences in production between the two languages. This information can indicate what is actually being transferred from native language and what might be a guess at target phoneme production.

### Triangulation of Data

Three different speaking tasks were developed for the participants: a word list, a story retell, and identification of Somali words. Target phonemes were collected in different speaking tasks to determine if speaking context influenced pronunciation. In one of the studies from the literature review, researchers comment on effect of formality of the tasks. Lin (2001) claims that the formality of a speaking task changed how Korean learners broke up consonant clusters. Lin's participants produced more errors in free speech than while reading word lists. Stibbard (2004) believed that participants would speak more carefully on a reading list than in an information sharing situation.

In contrast to the formality of the word list, participants provided more authentic speech in the story retell. Samples were compared to see if there are any differences between formal and informal speech. The third activity was one where the subjects are the experts. They looked at pictures and named the Somali words for the items depicted. Phonemes were compared in English and Somali to analyze whether participants were able to approximate native English pronunciation. Finally, pronunciation differences were analyzed between the beginning and intermediate learners in English.

### Setting

The setting was designed so that individual pronunciation was a priority. Data collection took place at an elementary school in a pullout setting during the school day. Participants were not kept after school. They were interviewed privately in an ESL classroom. My participants were in a familiar situation where they could feel

comfortable. Each participant was recorded on an individual basis, so that listening to the pronunciation of other students would not skew the results of the study.

### Participants

Girls were studied for two reasons. First, much of the traditional Somali culture tends to focus around males; Somali girls often get overlooked in matters outside of the home. Moreover, Somali girls tend to spend more time in the house helping their mothers with domestic chores while boys have more freedom to explore outside the home. Due to the different traditional expectations of gender and resulting experience, there could be a difference between the speech of boys and girls. Boys are more subjected to influences of friends and mainstream America whereas these influences outside of the home are more limited for Somali girls.

Eight female Somali speakers from a single Twin City elementary school served as the participants. With the exception of one girl who was born in the United States, all the participants had lived in Kenya before immigrating to America (Table 2). The participants were classified into two groups: beginning and intermediate ELLs. Three of the students had been in the US for two years or more. They created the core of the intermediate group. The fourth member had previous English experience in Kenya. The other four participants had been in the US for a year or less; they formed the beginning group.

Table 2: Participants' Grade Level, ESL Level, and Length of time in US

Speaker	A	B	C	D	E	F	G	H
Time in USA	.5	1	11	2	2	1	.5	.5
ESL level	month Beg.	year Beg.	years Int.	years Int.	years Int.	year Int.	month Beg.	years Beg.
Grade	3	4	5	5	4	4	5	4

### Data Collection Techniques

#### Word Lists

For the first sample, students read a list of minimal pairs. The words were ordered in the list so that words containing contrasting pairs did not appear next to each other (Appendix A). To offset lack of phrases, students used a carrier sentence (“I say \_\_\_\_ again”) while reading the list. The emphasis of this task was to elicit from participants specific phonemes that exist in English but not Somali. An emphasis was placed on eliciting specific phonemes initially, medially and finally within a word. The analysis focused on differences in VOT, vowel duration, and manner of articulation depending on the position within the word for each phoneme. Target phonemes were selected to be challenging to a Somali based on my contrastive analysis. The word lists contained minimal pairs of phonemes where two English phonemes are actually a Somali allophone /p,b/ and /f,v/. For example, ‘tab’ and ‘tap’ were selected because Somali has all the phonemes of the former, but is missing the final phoneme of the latter. The Somali ELLs’ pronunciation of English phonemes was compared to standard pronunciation of the English phonemes by a native speaker, as described in the literature.

### Story Telling

The second sample involved retelling a story from pictures. A comic strip was used (Appendix B) which contains pictures but no words. Certain nouns were pictured containing phonemes that I wanted to elicit from my participants, such as: 'bike' and 'turtle'. The story was told to each student with specific target words, in an effort to point out any unknown vocabulary and clarify which words to use. They in turn repeated the story as best they could. This part of the research was designed to get an authentic sample of each participant speaking in English.

### Picture Prompts

The third sample was meant to elicit phonemes in Somali in order to compare them with the English samples. Participants were shown pictures (Appendix C) and were asked to say what each word was in Somali. Again a carrier phrase was used ("say \_\_\_\_ again"). Like the previous samples, I chose Somali words to include all four target Somali phonemes /b,t,d,f/ in initial, medial and final environments. The phoneme /t/ did not occur word or syllable finally, so the amount of phonemic variation was more limited than with English words. The Somali language samples were intended to see when Somali ELLs start to reset their phonemic inventories to a second language.

### Technology

Speech samples were collected with a Memorex personal cassette recorder MB1055. Participants spoke into a Sony ECM-MS907 microphone. They held the microphone themselves about two inches from their mouths. Samples were transcribed and analyzed using Speech Analyzer software. The Analyzer has different components to

analyze speech samples. The waveform is one component required to measure VOT and vowel length. A second component, the spectrogram, is used to analyze voicing and manner of articulation. This speech analyzer software is downloaded from Summer Institute of Linguistics (2007).

#### Additional Considerations

There are two additional factors that could contribute to the outcomes of the study: the age of arrival of the ELLs and other languages they may have learned. Age of arrival can affect pronunciation of ELLs, as it is generally much easier for children who learn a second language younger than eleven to lose an accent than it is for adolescents and adults (Celce-Murcia et al 2004). Because elementary students, who learn second languages more easily, were studied, I wanted to be sure to include those students who have arrived in America within a year of my study and still had rather marked accents.

Other languages that students may have learned before coming to America were a consideration when analyzing their speech. Many Minnesotan Somalis are part of a second wave migration. After leaving Somalia, they lived in another country before coming to Minnesota. The languages they encountered after departing Somalia may have had phonemes that Somali doesn't have, which they learned to pronounce in those languages despite lacking the phoneme in Somali. If Somali ELLs learned a second language with /p/ in the phonemic inventory as young children, they should be able to produce a /p/ English phoneme more easily than those Somali ELLs who have never encountered it until arriving in America. Somalis frequently fled to Arabic speaking countries of North Africa or the Arabian Peninsula, or to neighboring Kenya. The

phonemic inventory of Arabic also lacks /p,v/ whereas Swahili, the native language of parts of Kenya has /p/ in its phonemic inventory. Somalis who are able to speak Swahili may be able to produce /p/ with more accuracy than Somalis who sought refuge in a country where Arabic was the native language.

The participants in my study have all lived in Kenya before immigrating to the United States with the exception of the one US born student. This data needs to be taken into consideration because my participants had two advantages that many Somali adult refugees do not have. The participants are young; they arrived in America and they speak a second language with a /p/ phoneme. They may be better able to produce /p,v/ more accurately in a shorter period of time than the average adult Somali who is currently working and having to communicate in English in the United States.

#### Data Analysis

The speech samples were transcribed and analyzed using Speech Analyzer software available from Summer Institute for Linguistics. Two components were used: the waveform and the spectrogram. I was looking for voice onset timing, vowel length, and manner of articulation to show how each phoneme was being produced.

VOT is measured from the beginning of the burst of aspiration following a stop to the first striation of the following vowel. It is rounded to the nearest 5 millisecond mark. Voicing was measured using the spectrogram. A bar appeared at the bottom of the spectrogram when a consonant was voiced. Vowel length is measured from the onset of energy of the vowel to the offset of energy. Vowel length is rounded to the nearest 5

millisecond. Manner of articulation required a spectrogram. The spectrogram shows either a stop with traces of color near the 0 to 1000 hertz range; by contrast a fricative showed frication around the 3000 to 5000 hertz range. Stops have a burst with articulation, whereas fricatives have a continuous stream of spectrogram energy (Ladefoged 2001).

After completing the analysis with the speech analyzer, samples of the participants' utterances in English were compared to those that are defined as Standard English by both Celce-Murcia et al (2004) and Ladefoged (2001). Samples of the beginning and intermediate speakers' were compared to one another. Finally, differences between participants' pronunciation of phonemes in English and Somali were analyzed. This concludes my discussion of the methodology. In Chapter Four, I report the results of my study. In Chapter Five, I discuss the additional research that is needed to have a better understanding of Somali phonetics, the classroom applications for ESL teachers, and the personal implications regarding my Somali students.

## CHAPTER FOUR: RESULTS

I am researching how voice onset timing, vowel length, and manner of articulation influence the production of the phonemes /p,b,t,d,f,v/ by Somali ELLs in both English and Somali. I compare how production of these six phonemes differs between ELL English and Standard English as described by literature. I analyze phoneme production for both beginning and intermediate ELLs to learn what phonemes may become easier to produce over time.

In the previous chapter, I discussed my methods, participants, tasks, and additional considerations. In this chapter, I report the results of the study in three sections: first, Somali data from the word identification, secondly, English data from the word list, and finally, data from the story retell. Within each data set I look at individual phonemes where I compare participants' English to Standard American English, results between beginners and intermediates, and differences Somali and English phonemes.

### Somali Analysis

In this section, results of samples of /b,t,d,f/ are presented for words in the Somali language. There are no results for /p,v/ because the phonemes do not exist in Somali. For each stop /b,d,t/ voice onset timing (VOT) in word-initial, word-medial and word-final position is given. For /f/, a fricative, the voicing is discussed. In addition, this section

looks at the effect of vowel length on phonemes. Finally, the effect of word position and manner of articulation is shown.

### Voice Onset Timing

Looking at the VOT, five aspects of Somali pronunciation of stops emerge. First, VOT lengthened as the phoneme is articulated farther back in the oral cavity. For example, the bilabial stop /b/ has a shorter VOT than the alveolar stops /t,d/ (Table 3). Secondly, word-initial VOTs are shorter than word-final VOT; medial stops tend to have the shortest VOT of all three positions within a word. Thirdly, voiced stops, /b,d/, are devoiced in sometimes initial and always final positions of words. Fourth, word-medial voiced stops are articulated as fricatives in over 50% of all samples. Finally, the distinction between /t,d/ in Somali seems to rely on factors other than VOT and voicing. The VOTs for both phonemes are very close. Word-initial /d/ is devoiced in over 60% of the samples. In this study finding the distinction between voiced and voiceless phonemes resulted in looking for the voicing bar on the spectrogram. There was a contrast between the bursts of /t,d/. The burst for the phoneme /t/ was defined through the entire length of the spectrogram from 0-5000 hz. The burst for /d/ was smaller; it went from 0-400 hz. Each stop is subsequently examined in further depth.

Table 3: Mean VOT (Standard Deviation) for Somali Stops in Milliseconds with Percentage of Voiced Stops

	Word-initially	Word-medially	Word-finally
	35 (12)	25 (4)	64 (21)
	43%	100%	0%
/d/	42 (17)	34 (10)	58 (20)
Percent Voiced	33%	86%	0%
/t/	40 (13)	36 (9)	Does not occur
Percent Voiced	0%	6%	word-finally

The first phoneme I examine is /b/. All eight participants produced ‘buug’, four produced ‘basali’, and five produced ‘buluug’. For word-initial /b/, VOTs range between 32 ms and 41 ms (Table 4), with the longest VOT for ‘buug’ also having the greatest standard deviation. In the initial position, participants pronounced a devoiced ‘b’ as /p/ as in ‘buug’ *book* /pu:k/ in 65% of all words. Word-medially, seven of eight participants produced ‘toban’ and ‘todoba’, and six said ‘abeh’. The phoneme /b/ was articulated as a voiced fricative. ‘Abeh’ *dad* was an exception; it was produced as a fricative by five participants; the other three participants produced it as a stop. Word-finally, eight participants produced ‘hibil’ and ‘kab’, six said ‘koob’. Mean VOT for /b/ was around 60 ms. The final consonant was devoiced by every participant.

Table 4: Mean VOT (Standard Deviation) for Somali /b/ in Milliseconds with Percentage of Voiced Stops

	Word-initially		Word-medially		Word-finally	
VOT	buug	41 (14)	abeh	25 (4)	hibib	64 (21)
Percent voiced	29%		100%		0%	
VOT	basali	33 (8)	todoba	(fricative)	kab	60 (12)
Percent voiced	0%		100%		0%	
VOT	buluug	32 (7)	toban	(fricative)	koob	55 (14)
Percent voiced	80%		100%		0%	

There were a few inconsistencies in some of the words. The first was voicing in word-initial /b/. With ‘buluug’ *blue* /bulu:k/, most of the samples were voiced. However, participants voiced the other two word-initial words, ‘buug’ and ‘basali’, only 33% of the time. Devoicing initial ‘b’ seems to be a norm. A similar situation occurred with /b/ as a word-medial fricative in ‘abeh’ *dad*. It was produced as a voiced medial fricative, /aβɔ/, and as a voiced stop, /abɔ/. The VOT of /abɔ/ was 25 ms. This VOT was the shortest of all /b/ VOTs for the Somali words. Despite the three stop samples of ‘abeh’, producing a medial fricative seemed to be a norm for the phoneme as the twenty-one remaining medial phonemes were articulated as fricatives.

Somali /d/ had many of the same phonetic patterns as /b/. Initial mean VOT were close, (Table 5) ranging from 37 ms in ‘dibi’ to 48 ms in ‘diyaarad’. Eight participants said ‘diyaarad’ and ‘dooro’, four produced ‘dibi’. Word-initial /d/ was devoiced a little over 60% of the time by the participants. Word-medially, all eight participants produced

‘saddex’, seven said ‘todoba’ and ‘siddeed’. The VOT of /d/ was 30 ms at the shortest mean in ‘todoba’. The longest mean was 41ms in ‘siddeed’. In the medial position ‘d’ was pronounced as a stop in 82% of all samples mostly with voicing. In the remaining 18% of samples, it was articulated as a voiced fricative /ð/. In the final position participants produced every phoneme as a voiceless stop /t/. Word-final mean VOT had the largest range from 48 ms in ‘koofiyad’ to 61 ms in ‘siddeed’. As with /b/ the word-final phoneme /d/ was devoiced 100% of the time. Word-final /d/ sounds identical to English /t/.

Table 5: Mean VOT (Standard Deviation) for Somali /d/ in Milliseconds with Percentage of Voiced Stops

	Word-initially		Word-medially		Word-finally	
VOT	diyaarad	48 (14)	todoba	30 (8)	diyaarad	58 (15)
Percent voiced	38%		86%		0%	
VOT	dooro	42 (19)	saddex	31 (9)	siddeed	61 (26)
Percent voiced	40%		100%		0%	
VOT	dibi	37 (16)	siddeed	41 (9)	koofiyad	48 (3)
Percent voiced	33%		71%		0%	

Word-initial VOT for /d/ varied a great deal among the individual participants: the highest being 75 ms and the lowest 25 ms within the same word ‘dooro’. In the word-initial positions, most participants voiced at least one of their phonemes. The exceptions were two girls who devoiced word-initial /d/ in each sample: /tiya:rat/, /to:ro/ and /tiβi/.

The Somali phoneme /t/ had fewer variations than either /b/ or /d/ (Table 6). The distribution is restricted to word-initially and medially. The participants all produced ‘toban’ and ‘tufaax’; seven said ‘todoba’. Word- initially the mean VOT was 40 ms. Word-initially, /t/ was always voiceless. Medially, the mean VOT averaged 36 ms. Eight participants produced ‘takhtar’, seven said ‘konton’, and four said ‘hotel’. All but one word of medial /t/ were voiceless; one participant voiced word-medial /t/ in ‘takhtar’ *doctor*. Of the three stops, /b,d,t/, I examined, /t/ had the least amount of phonemic variation.

Table 6: Mean VOT (Standard Deviation) for Somali /t/ in Milliseconds with Percentage of Voiced Stops

	Word-initially		Word-medially	
VOT	todoba	37 (11)	konton	39 (8)
Percent voiced	0%		0%	
VOT	toban	48 (14)	takhtar	34 (9)
Percent voiced	0%		13%	
VOT	tufaax	37 (11)	hotel	33 (6)
Percent voiced	0%		0%	

There is no VOT for fricatives, so the data for /f/ is reported for voicing only.

Moreover, word-final /f/ is not common in Somali so the target words for that particular position had only two items.

The data for the fricative /f/ was consistent across all word environments (Table 7). Word-initially, all participants said ‘fure’, five said ‘fiyare’, and four said ‘far’. In

medial words all eight participants produced all three items. Word-finally seven participants produced ‘laf’; three produced ‘khasif’. Every participant produced a voiceless fricative for each /f/ phoneme no matter where it occurred within the word. The voicing of /f/ was more consistent than any of the stops.

Table 7: Percentage of Voiced /f/ Phonemes

	Word-initially		Word-medially		Word-finally	
Voiced	far	0%	afar	0%	laf	0%
Voiced	fiore	0%	koofiyad	0%	khasif	0%
Voiced	fure	0%	tufaax	0%		

### Vowel Length

Somali has both short and long vowels; they are orthographically represented as a single vowel for a short sound and a double vowel for a long sound. The participants in the study followed many of the norms of their native language with vowel length, making short vowels shorter than long vowels. In this study vowel length is only measured for those vowels preceding a stop. This section considers only words with short vowels first followed by words with long vowels or a combination of short and long within the same word. There was a clear distinction between long and short vowels within the same word. The number of participants producing each target word in the vowel length section is the same as that from the preceding VOT section.

The short vowel length (Table 8) was between 66 ms and 95 ms in length. The values shown in the table reflect the vowels preceding a stop within the word. There is a consistent pattern to the short vowel lengths.

Table 8: Short Vowel Length (Standard Deviation) Measured in Milliseconds

koofiyad	68 (8)	dibi	68 (18)
saddex	66 (30)	toban	82 (36)
kab	95 (31)	hibil	78 (26)
hotel	68 (18)	todoba	66 (15)
diyaarad	85 (16)		

The data on words with long vowels demonstrates a consistent pattern of vowel length (Table 9). The long vowels ranged between 140 ms and 161 ms in length. I had one word where both long and short vowels preceded stops within a single word: ‘sideed’ /sidi:t/. The lengths of the two vowels contrast with the mean of the short vowel at 53 ms and the mean of the long vowel at 161 ms. There is a very consistent pattern for short and long vowel lengths in Somali.

Table 9: Long Vowel Length (Standard Deviation) Measured in Milliseconds

buug	145 (48)	koob	144 (41)
buluug	140 (70)	sideed	53 (8) 161(48)

### Manner of Articulation

Overall the manner of articulation of the Somali consonants studied was quite consistent (Table 10). The number of participants producing each target word in the manner of articulation section is the same as that from the preceding VOT section. The consonants in the study were either produced as stops or as fricatives. Each participant articulated /t/ as a stop in each word environment. The phoneme /f/ was a fricative in every word environment. With /b,d/, all word-initial and word-final items were

articulated as stops. Word-medially variations occurred for /b,d/. The phoneme /b/ was produced as a fricative 88% of the time; ‘abeh’ was the word that caused exception here since the medial ‘b’ was produced as both a stop and a fricative. The word-medial phoneme /d/ was a stop 60% of the time. This could be an influence of acquiring English or Swahili as second languages where word-medial /d/ is produced as a stop. Despite the word-medial voiced stops which caused a few exceptions, patterns in manner of articulation were very consistent.

Table 10: Percentage of Samples Articulated as a Fricative

	Initial	Medial	Final
/b/	0% - all stops	88%	0% - all stops
/t/	0% - all stops	0% - all stops	
/d/	0% - all stops	40%	0% - all stops
/f/	100%	100%	100%

### English Analysis

English data follow in two sections: first the more formal reading list; second, an authentic speaking sample, a story retell. In each section the phonemes /p,b,t,d,f,v/ are presented with beginning and intermediate learners. The mean VOT of stops is analyzed word-initially, medially and finally; voicing of fricatives /f,v/ is included. Next, the effect of vowel length preceding stops is discussed. Finally, the influence of phonemic word-position on manner of articulation is analyzed.

## Reading List

VOT

Four patterns emerged from the production of English stops by the participants. First beginners' VOT increased as the place of articulation moved from front of mouth towards the back (Table 11). For example, mean VOT for /p/ is shorter than the VOT for /t/. Secondly, the intermediate group generally had longer VOTs for voiceless phonemes than for voiced; mean VOT for /p/ words is longer than the mean for /b/ words. Thirdly, both groups were more accurate with voicing word-initial and medial phonemes than with word-final phonemes. Many samples of voiced phonemes /b,d/ were devoiced in the word-final position.

Table 11: Mean VOT (Standard Deviation) for English Stops in Milliseconds with Percentage of Voiced Stops

Phoneme	Word-initially		Word-medially		Word-finally	
	Beg.	Int.	Beg.	Int.	Beg.	Int.
/p/	34 (17)	71 (31)	50 (7)	60 (15)	72 (30)	60 (36)
Percent voiced	9%	18%	50%	33%	18%	33%
/b/	33 (14)	31 (12)	54 (18)	31 (4)	65 (28)	60 (22)
Percent voiced	82%	66%	50%	42%	30%	36%
/t/	53 (26)	74 (21)	58 (18)	74 (17)	72 (17)	44 (12)
Percent voiced	9%	0%	0%	9%	11%	27%
/d/	45 (17)	33 (13)	55 (25)	35 (9)	41 (13)	42 (13)
Percent voiced	82%	83%	82%	100%	20%	75%

Pronunciation of English phoneme /p/ had varied results for the voicing and VOT when produced by Somali speakers (Table 12). All eight participants produced a word-

initial consonant for each of the three words. Word-initially the two groups had very different VOTs. Beginners produced unaspirated /p/ with mean VOT at 34 ms.

Intermediates produced aspirated /p/ with mean VOT at 71 ms. Both groups devoiced most /p/ phonemes. Word-medially all four intermediate participants produced the words.

All four beginners produced 'pepper', three of four produced 'bopping', and two of four produced 'hopping'. With medial /p/, the mean VOTs for the two groups were not as

divergent. Both groups voiced word-medial /p/ more frequently than they did in the

initial position. Word-finally, all four intermediates produced the phonemes. Four

beginners produced 'rip' and 'cap', three of four produced 'tap'. In the final position,

beginners had a mean VOT of 72 ms and intermediates had a mean of 60 ms. In most

instances the speakers produced voiceless /p/. Beginners produced a voiceless final

consonant about 85% of the time; they were more accurate with their voicing.

Intermediates produced voiceless /p/ 66% of the time.

Table 12: Mean VOT (Standard Deviation) for /p/ in Milliseconds with Percentage of

## Voiced Stops

	Beginner	Intermediate
Pug - VOT	31 (13)	83 (29)
Percent voiced	25%	0%
Pack - VOT	30 (14)	75 (37)
Percent voiced	0%	25%
Pat - VOT	38 (23)	56 (23)
Percent voiced	0%	25%
Pepper – VOT	48 (3)	63 (14)
medial /p/		
Percent voiced	50%	25%
Bopping – VOT	50 (10)	65 (5)
Percent voiced	66%	50%
Hopping – VOT	55 (5)	54 (17)
Percent voiced	33%	25%
Tap – VOT	75 (12)	38 (11)
Percent voiced	0%	75%
Rip – VOT	80 (44)	84 (39)
Percent voiced	0%	0%
Cap – VOT	63 (16)	58 (27)
Percent voiced	50%	25%

The phoneme /p/ had three interesting features. The first was the large range for word-initial mean VOTs. The shortest initial VOT was 30 ms for ‘pack’ by the beginning group. The longest initial VOT was 83 ms for ‘pug’ by the intermediate group. The beginners’ VOTs were close to those of devoiced Somali /b/. The intermediate longer word-initial mean could be an attempt to reach American standards. The second distinction for this phoneme occurs word-finally with voicing. The beginners produced the target phoneme /p/ more frequently than the intermediates. In the case of ‘tap’, all the

beginners produced a voiceless phoneme, /tæp/. Three of the four intermediate participants voiced the final phoneme in ‘tap’, producing /tæb/. Beginners were following the pattern of Somali devoicing. The intermediates seem to be randomly voicing and devoicing word-initial and final /p/. The third feature was the medial voicing of both groups. At least a quarter of the medial phonemes were articulated as medial voiced fricatives. A part of the increase in medial voicing could be attributed to the difference in manner of articulation between medial and initial/final positions within the word. The VOTs for /p/ seem to fall into two distinct patterns: shorter for the beginners, and longer for the intermediates. The voicing patterns appear random particularly for the intermediates.

The participants varied pronunciation of /b/ in English as they did with /p/ (Table 13). In the initial position, both beginner and intermediate VOTs averaged around 30-35 ms. All eight participants produced every word-initial consonant, except one beginner did not say ‘bat’. Both groups of participants voiced most of the initial /b/. In the word-medial position, all participants produced every /b/ phoneme; however, one intermediate did not say ‘bubble’. Beginners produced mean VOT of 54 ms. The intermediates maintained a VOT of 31 ms, as in the initial position. The word-medial stop was devoiced in half the items for both beginners and intermediates. In a few cases, participants from both groups produced word-medial fricatives instead of stops. Word-finally all participants said ‘tab’, three beginners and all intermediates said ‘rib’, and three beginners and three intermediates said ‘cab’. In the final position the mean VOT

had the longest length of all environments. Word-final /b/ was not voiced by either group in the majority of their target words.

Table 13: Mean VOT (Standard Deviation) for /b/ in Milliseconds

	Beginner	Intermediate
Bug – VOT	34 (17)	42 (12)
Percent voiced	75%	100%
Book – VOT	39 (13)	26 (9)
Percent voiced	75%	50%
Bat – VOT	32 (8)	28 (9)
Percent voiced	100%	50%
Bubble – VOT	60 (22)	30 (4)
Medial /b/		
Percent voiced	50%	75%
Pebble- VOT	48 (10)	33 (3)
Percent voiced	50%	33%
Tab – VOT	74 (35)	48 (21)
Percent voiced	50%	50%
Rib – VOT	70 (15)	75 (20)
Percent voiced	0%	0%
Cab – VOT	48 (19)	48 (3)
Percent voiced	33%	66%

Two phonemic environments caused voicing issues. The first was word-medial /b/. Only one out of eight participants produced /b/ as a voiced stop for both ‘pebble’ and ‘bubble’. The remaining seven participants produced at least one phoneme without voicing or produced fricatives instead of stops. The second issue was word-finally. With ‘rib’ every participant devoiced the final consonant, /rɪp/. With ‘cab’ and ‘tab’ devoicing varied. No one participant voiced final /b/ in each word. The participants had difficulty producing /b/ as a voiced stop.

Most of the variation with the data for /t/ involved the timing in milliseconds.

Mean VOTs for each word-initial stop varied for both beginners and intermediates (Table 14). In word-initial items all eight participants produced every word with the exception of one beginner who did not say 'tusk'. Both groups produced voiceless consonants in every word. In the medial position, VOTs were much the same as they were for initial. Again, all word-medial /t/ phonemes were voiceless with the exception of one phoneme for 'eaten' which was a voiced fricative. Medially, all participants produced all words; one intermediate did not say 'atone'. The VOTs in the final position remained consistent for beginners while those for intermediates shortened VOTs. All participants produced all three word. Most samples of word-final /t/ were devoiced with the exception of two participants who voiced word-final /t/.

Table 14: Mean VOT (Standard Deviation) for /t/ in Milliseconds with Percentage of

## Voiced Stops

	Beginner	Intermediate
Tub- VOT	71 (31)	74 (18)
Percent voiced	0%	0%
Tusk – VOT	32 (8)	68 (20)
Percent voiced	33%	0%
Ton – VOT	50 (13)	83 (23)
Percent voiced	0%	0%
Hotel – VOT	65 (23)	75 (18)
Percent voiced	0%	0%
Eaten – VOT	55 (15)	67 (12)
Percent voiced	0%	25%
Atone – VOT	54 (13)	80 (18)
Percent voiced	0%	0%
Feet – VOT	58 (8)	38 (13)
Percent voiced	33%	25%
Seat – VOT	58 (12)	44 (11)
Percent voiced	0%	25%
Hit – VOT	85 (15)	46 (12)
Percent voiced	0%	25%

Compared with /p,b/, /t/ seems a consistent phoneme. There are two examples of how the intermediates were able to approximate /t/ as a native speaker would. One intermediate medial phoneme varied from the rest of the participants due to frication. An intermediate phoneme was turned into a fricative; ‘eaten’ was pronounced /iðɛn/, which could be an attempt to produce a short ‘tap’ as a native speaker would. In the next example, the two intermediates who had been in the US longest had longer VOTs than the rest of the intermediates. These two students frequently had VOTs in the 70s ms which raised the mean for the intermediates as a whole for these two word positions.

These two participants seemed to recognize that they need to increase aspiration to make a /t/ sound more ‘native’ to an American. One beginner seemed to struggle with producing the word-final /t/ phoneme. She said each word, but did not produce the final consonant on any of the three words. She did seem to be the exception to a consistently produced consonant. Overall, the participants were able to produce /t/ as a voiceless stop with relative ease.

The phoneme /d/ is the final stop in the analysis; it did not have a consistent pattern as /t/ did. Word-initial VOTs are shorter than /t/ (Table 15). All eight participants produced every word-initial consonant although one beginner did not say ‘done’. Both groups of participants voiced /d/ for ‘dusk’ and ‘done’. However, ‘dub’ was devoiced. Word-medially, all participants said ‘meadow’, one beginner did not say ‘padded’, and one intermediate did not say ‘indeed’. With medial /d/ the VOT averages were longer than for word-initial for both groups. Medial /d/ was voiced by all participants in each word with the exception of one beginner. Word-finally, every participant produced every phoneme. Word-final /d/ had the shortest mean VOT for the beginners at 41 ms and longest at 42 ms for intermediates. The beginners either devoiced final /d/ or eliminated the phoneme from the word. The intermediates voiced most word-final consonants.

Table 15: Mean VOT (Standard Deviation) for /d/ in Milliseconds

Target Word	Beginner	Intermediate
Dub – VOT	53 (8)	37 (20)
Percent voiced	50%	50%
Dusk – VOT	45 (18)	31 (4)
Percent voiced	100%	100%
Done – VOT	33 (19)	31 (6)
Percent voiced	100%	100%
Padded – VOT	65 (29)	42 (6)
Percent voiced	66%	100%
Meadow – VOT	68 (21)	40 (0)
Percent voiced	75%	100%
Indeed – VOT	38 (8)	27 (5)
medial /d/		
Percent voiced	100%	100%
Feed – VOT	30 (11)	55 (8)
Voiced	25%	50%
Seed – VOT	48 (10)	30 (4)
Voiced	0%	100%
Hid – VOT	43 (9)	36 (10)
Voiced	25%	75%

The phoneme /d/ had a number of variations in production. The VOT of /d/ in ‘dub’ was greater than the VOTs for the two other word-initial target words. The participants voiced ‘dub’ less frequently than the other two words. Word-medially, ‘indeed’ has a shorter VOT than other the other two target words. That could be due to word-medial /d/ in ‘indeed’ following a consonant, not a vowel, as with ‘padded’ and ‘meadow’. Medial /d/ had voicing and manner of articulation variations for beginners. One beginner produced a voiced medial fricative. Another beginner did not voice two of her three medial phonemes. Two intermediates produced a medial flap on ‘meadow’

/mɛrə/ as an American native speaker might. These two girls have obviously acquired the way in which an American would produce the word 'meadow'.

Final /d/ was difficult for both groups to voice. Not one of the beginners was able to voice every final /d/ phoneme. Intermediates also had more difficulty voicing word-final /d/ than those of the other two word positions. This is a characteristic that occurred with /b/ as well. It could be that because Americans tend to aspirate word-initial phonemes; Somalis have picked up the emphasis on word-initial phonemes, but not the subtlety of the word-final position.

The English fricative /f/ was very easy for the participants to produce correctly. Each phoneme in every position within the word: initial, medial and final was produced as a voiceless fricative without exception. Word-initially, eight participants produced 'few' and 'fine'; seven participants said 'face'. In the word-medial position, seven of eight participants produced the target words: 'effort', 'laughing', and 'effect'. Word-finally, all participants produced the samples: 'fife', 'half', and 'safe'.

My data clearly show that voicing /v/ is an acquired phoneme (Table 16). Word-initially all eight participants produced every target word. Beginners had one phoneme which was voiced; all other items were voiceless phonemes. Intermediates produced at least half of all initial phonemes with voicing. Both groups fared better with medial phonemes. Eight participants produced the target words: 'living' and 'even'; six said the word 'heaven'. The beginners voiced half of their phonemes while intermediates voiced

all medial phonemes. Word-finally, all participants produced every phoneme with the exception of one intermediate who did not say 'save'. Both groups had a more difficult time with voicing. The beginners did not voice any final phonemes. The intermediates ranged between 25% and 75% on voicing the final fricative. The intermediates, while still needing to master voicing for /v/, correctly produced the phoneme more frequently than beginners.

Table 16: Percentage of Voiced /v/ Phonemes

Target word	Beginner	Intermediate
Vase		
Percent voiced	0%	50%
View		
Percent voiced	25%	100%
Vine		
Percent voiced	0%	75%
Living		
Percent voiced	50%	100%
Even		
Percent voiced	50%	100%
Heaven		
Percent voiced	50%	100%
Five		
Percent voiced	0%	50%
Have		
Percent voiced	0%	75%
Save		
Percent voiced	0%	25%

### Vowel Length

English vowel length is important because it signals voicing of a final stop to the listener. Vowel length was measured in consonant, vowel, consonant (CVC) words and also in syllables preceding stops /p,b,t,d/ from the study. A native English speaker would

lengthen the vowel preceding a voiced stop /b,d/. The data is presented as long (preceding a voiced stop) or short (preceding a voiceless stop). The number of participants producing each target word in the vowel length section is the same as that from the preceding VOT section.

Vowel length results differed between the two groups of participants (Table 17). Though vowel lengths seem to vary greatly between the two columns, two patterns emerge. The beginners have virtually identical means for the long vowels at 119 ms and the short vowels at 113 ms. The beginning group is not making a distinction in vowel length in English. The intermediates means differed between the lists; they averaged 103 ms for the long vowels and 89 ms for the short vowels. The intermediate group did make a slight difference. It appears that intermediates do understand the vowel lengthening. Although the distinction between long and short vowels is not pronounced for the intermediate group, the data demonstrate that intermediates better understand the pattern of English vowel length than the beginners do. The intermediate validate that this is an aspect of English that they are learning.

Table 17: Average Vowel Lengths for Vowels Preceding Stops (Standard Deviation) in Milliseconds

Vowel preceding voiced stop		Vowel preceding voiceless stop	
Beginner	Intermediate	Beginner	Intermediate
119 (34)	103 (23)	113 (23)	89 (20)

### Manner of Articulation

The analysis on manner of articulation includes not only the stops, but fricatives /f,v/ as well. Each phoneme is analyzed to determine if it is a stop or fricative. The placement of the phoneme is also taken into consideration. The number of participants producing each target word in the manner of articulation section is the same as that from the preceding VOT section.

There are distinct patterns with manner of articulation (Table 18). For both beginners and intermediates, all /f,v/ word-initial, medial and final phonemes were produced as fricatives. Transferring knowledge of fricatives between Somali and English is easy for the participants of the study.

Table 18: Percentage of Samples Articulated as a Fricative

	Initial		Medial		Final	
	Beg.	Int.	Beg.	Int.	Beg.	Int.
/p/	0%	8%	20%	9%	0%	8%
/b/	0%	0%	25%	25%	0%	18%
/t/	0%	0%	0%	9%	11%	11%
/d/	0%	0%	9%	10%	0%	0%
/f/	100%	100%	100%	100%	100%	100%
/v/	100%	100%	100%	100%	100%	100%

Stops were a bigger challenge to the participants. Word initially the beginners and intermediates produced /p,b,t,d/ as stops. Medially, beginners produced /p,b,d/ as fricatives in some words as they would in Somali. For intermediates /b/ was the biggest challenge to produce as a stop. In Somali words /b/ was produced as a medial fricative

more often than any other phoneme. The remaining intermediate medial phonemes /p,t,d/, were produced as stops in almost every word. Word finally, beginners produced stops for /p,b,t,d/. Intermediates produced /d/ as a stop; some /p,b,t/ phonemes were produced infrequently as fricatives. In this position, the final stop was joined to ‘again’ the last word of the carrier sentence and the phoneme became a voiced fricative. This fricative production follows the phonetic rules of Somali.

### Story Retell

The final task was a story retell where target words were connected in an authentic speaking environment. The section is divided into three subsections: pronunciation of stops and fricatives in word-initial, medial and final positions. In the second division, the vowel length preceding stops is measured. Finally, patterns pertaining to manner of articulation for the phonemes /p,b,t,d,f,v/ are examined.

The story retell includes a target word for each phoneme in each position. Data for percentage of voicing for each phoneme within the word environment is presented.

For word-initial /p/, the two groups had very different mean VOTs (Table 19). All eight participants produced initial /p/ phoneme in ‘Pepsi’, one beginner omitted the medial /p/ from this word. For both groups the word-initial and medial VOTs were consistent. Both groups of participants were better able to produce voiceless phonemes than on the reading list words. Three beginners were able to produce medial /p/ as a stop. The intermediates produced medial /p/ as a voiceless stop. Word-finally, all intermediates

produced ‘cup’. Only two beginners produced the word ‘cup’ and both those participants omitted the final phoneme on the word. Therefore, there is no beginners’ data for /p/ word-finally. The intermediate students produced the phoneme; the mean VOT 62 ms, was shorter than /p/ word-initially or word-medially. All intermediate word-final phonemes were voiceless.

Table 19: Mean VOT (Standard Deviation) for /p/ with Percentage of Voiced Phonemes

	Beginner	Intermediate
Pepsi-initial	40 (12)	96 (67)
Percent Voiced	25%	0%
Pepsi-medial	33 (6)	89 (23)
Percent Voiced	33%	0%
Cup	/p/ was not produced	62 (17)
Percent Voiced		0%

Participant level seemed to divide the results for the /p/ phoneme. The beginners had more difficulty while the intermediates managed to produce it correctly. The US born student produced ‘Pepsi’ with a lot of aspiration. Her initial /p/ had a VOT of 210 ms and the medial had a VOT of 125 ms. This is a word that she has no doubt heard frequently. She had little problem producing it correctly; it was very aspirated. Most beginners produced word-initial /p/ as voiceless. Three of the four beginners produced the word ‘Pepsi’. Two produced a voiceless stop /pɛpsi/, one produced a voiced fricative. The other beginner omitted the medial phoneme and produced /pɛsi/.

This task proved to be more difficult for beginners than for intermediates. The beginners tried to identify the target word from the story. The particular target word may

not have been a part of their vocabulary. The beginners may not have known the word ‘cup’ and therefore omitted it partially or completely from their retell. The intermediates by contrast knew what both ‘Pepsi’ and ‘cup’ were and managed to produce the /p/ phoneme correctly.

There was little variation between the two groups with /b/ (Table 20). All participants said the initial and medial words: ‘bike’ and ‘hamburger’. The mean VOTs for both groups were similar. Beginners still had difficulty voicing /b/. The intermediates were successful voicing word-initial and medial phonemes. Word-finally, three intermediates and one beginner produced the word ‘cube’. The beginner did not pronounce the final /b/. The three intermediate participants all devoiced final /b/.

Table 20: Mean VOT (Standard Deviation) for /b/ with Percentage of Voiced Phonemes

	Beginner	Intermediate
Bike - VOT	36 (4)	38 (8)
Percent voiced	50%	100%
Hamburger – VOT	43 (11)	34 (5)
Percent voiced	75%	100%
Cube – VOT	/b/ not produced	55 (5)
Percent voiced		0%

The same issues from /p/ seem to affect both groups for /b/ as well. Beginners were not familiar with all the target words like ‘cube’. The one beginner who had produced ‘cube’ had been in the country for two weeks prior to the study. She omitted the final consonants on all speaking samples in the ‘b’ category. She produced /bɪ/, /hambɪr/,

and /ku/. I assume that the other three beginners were not familiar with ‘cube’ and therefore did not say it in their retell. The intermediates fared well and were able to successfully voice /b/ with better consistency than on the reading list. The one phoneme they did not successfully voice was final /b/. Of the three /b/ words, I assume this is the one they have heard least.

For /t/ there was little variety with VOT and voicing (Table 21). Initially, all eight participants said ‘turtle’. The mean VOT had a large range. The two groups managed to have more similar VOTs for word-medial and final positions. All /t/ phonemes were voiceless. Medial /t/ in ‘vegetables’ caused the greatest variation for the participants. Three beginning and three intermediate participants produced ‘vegetables’. The pronunciation was /vɛgəbəl/ for one newcomer. The remaining two beginners produced /vɛgətəbəl/; two of the intermediates also produced ‘vegetables’ in this manner. The two intermediates who had been in the United States the longest amount of time pronounced /vɛgtəbəl/. Word-finally all participants produced the word ‘cat’ with the exception of one beginner. The VOT is similar to that of the medial position for both groups. The stop /t/ caused the least amount of variations on the reading list of the four stops. Most of the participants had some familiarity with the /t/ words, even if it was difficult to pronounce correctly as in the case of ‘vegetable’.

Table 21: Mean VOT (Standard Deviation) for /t/ with Percentage of Voiced Phonemes

	Beginner	Intermediate
Turtle – VOT	74 (14)	90 (18)
Percent voiced	0%	0%
Vegetables – VOT	60 (20)	53 (8)
Percent voiced	0%	0%
Cat – VOT	69 (8)	60 (4)
Percent voiced	0%	0%

The two groups had more variation with VOTs and voicing with /d/ than with /t/.

The /d/ VOTs for the beginning group were consistently longer than for the intermediate group (Table 22). Beginners did not always voice /d/ phonemes. The intermediate group voiced each /d/ in each word.

Table 22: Mean VOT for /d/ with Standard Deviations

	Beginner	Intermediate
Dog – VOT	53 (8)	33 (4)
Percent voiced	75%	100%
Mc Donald – VOT	37 (6)	35 (4)
Percent voiced	100%	100%
Ride – VOT	53 (3)	37 (10)
Percent voiced	50%	100%

Word-initially, all participants said the word 'dog'. Four intermediates and three beginners produced the word 'McDonald's'. In the final position, all intermediates and two beginners said the word 'ride'. The /d/ target words are common in American English. While the beginners frequently dropped the final /d/ on 'McDonalds'; each participant did voice the medial /d/. It is possible that all participants were more

successful with VOTs and voicing due to familiarity with the target words. With these groups of stops, the intermediate participants achieve greater accuracy with VOT and voicing than the beginners. These results do show that the intermediate are changing their phonetic constraints from Somali to English norms when pronouncing English words.

Voicing of /f/ was consistent for all participants as seen in Table 23. Three beginners and all intermediates produced ‘French fries’. Word-finally, three intermediates and one beginner said ‘laugh’. Both groups produced voiceless fricatives for all items in the story retell. The participants are able to transfer Somali knowledge of /f/ to English without any difficulty.

Table 23: Percentage of Voiced /f/ Phonemes

	Beginner	Intermediate
French		
Percent voiced	0%	0%
Fries		
Voiced	0%	0%
Laugh		
Voiced	0%	0%

Participants had variations in voicing /v/ in English (Table 24). Word-initially, three participants in each group said ‘vegetables’. Beginners voiced one item while the intermediates voiced two of their initial items. Word-medially two beginners and all intermediates produced the word ‘having’. Here, both groups increased voicing. Word-finally one beginner and all intermediates said ‘love’. The beginner did not voice final /v/ on her item. Intermediates voiced half of their word-final items. As with the stops in

the retell, the intermediates show evidence of conforming to English voicing because they achieve greater accuracy than the beginners do.

Table 24: Percentage of Voiced /v/ Phonemes

	Beginner	Intermediate
Vegetables		
Percent voiced	33%	66%
Having		
Percent voiced	50%	100%
Love		
Percent voiced	0%	50%

### Vowel length

All words in the vowel length analysis are CVC. As in the previous English reading list section, the overall patterns of vowel length are analyzed for the beginning and intermediate groups. The number of participants producing each target word in the vowel length section is the same as that from the preceding VOT section.

The vowel lengths demonstrate a consistent pattern of learning (Table 25). The mean vowel length for beginners' long vowel words is 119 ms. The mean for their short vowel words is 128 ms. The beginners' mean for short vowels was actually longer than the mean for long vowels. The intermediates had a mean vowel length of 156 ms for the long vowels and 111 ms for short vowels. The beginners did not lengthen vowels preceding word-final voiced stops as is the pattern in English. The intermediates made a clear distinction in short and long vowel lengths in the story retell. Intermediates demonstrate that they have an understanding of the English vowel length patterns.

Table 25: Mean Vowel Length (Standard Deviation)

Vowel preceding voiced stop		Vowel preceding voiceless stop	
Beginners	Intermediates	Beginners	Intermediates
119 (40)	156 (60)	128 (21)	111 (30)

### Manner of Articulation

In this section manner of articulation for target phonemes /p,b,t,d,f,v/ in each environment is reported. Because of the small sample of the target words, there was only one word included for each word position. Gaps in the data reflect where beginners did not produce the target phoneme. The number of participants producing each target word in the manner of articulation section is the same as that from the preceding VOT section.

There were few variances with manner of articulation between the two groups (Table 26). For initial /p/ beginners created stops, word-medially one beginner of three produced a fricative instead of a stop. None of the beginners produced the final /p/ in cup. All intermediates produced /p/ as a stop in all word environments. For the phoneme /b/ all participants produced a stop. However, none of the beginners were able to produce a final /b/ phoneme. All participants produced the phonemes /t,d/ as stops in all words. For /f/ all participants produced a fricative. With /v/ there were only target words for the initial and final positions; all participants produced /v/ as a fricative.

I have speculations as to why the beginning group was not as forthcoming with their target words in the story retell. Perhaps the beginners were hesitant about producing

the word because it was no longer written in front of them. The spontaneity of free speech could be challenging for the newcomers, especially for the two participants who had been in the country less than one month. Additionally, remembering an unfamiliar target word such as ‘ice cube’ may have created another obstacle. Despite the challenge of the story retell the pattern emerged that they could produce sounds.

Table 26: Percentage of Samples Articulated as a Fricative

	Initial		Medial		Final	
	Beg.	Int.	Beg.	Int.	Beg.	Int.
/p/	0%	0%	33%	0%	-	0%
/b/	0%	0%	0%	0%	-	0%
/t/	0%	0%	0%	0%	0%	0%
/d/	0%	0%	0%	0%	0%	0%
/f/	100%	100%	100%	100%	100%	100%
/v/	100%	100%	No data		-	100%

This concludes the reporting section of Chapter Four. In the next section, I discuss the results of the data. I compare the participants’ English words to those that literature reports are typical of speakers of standard American English. I compare the English words of the beginners and the intermediates in the reading list and story retell. Finally, I compare the participants’ Somali words to those in English.

### Discussion

In this section, I look at the data my study produced in the context of the real world issues that inspired me to investigate this subject. To determine where pronunciation difficulties might make a Somali ELL incomprehensible to a native speaker, I compare ELL English samples with native English speakers as documented in

literature. To analyze patterns of learning among ELLs, I contrast beginner and intermediate words in English. To discover possible causes of pronunciation problems in English, I examine the influence of Somali on the production of English phonemes. Each of these analyses is done in subsections of VOT, vowel length, and manner of articulation.

To compare ELL words with Standard American English, I use data from the English reading list and the story retell. First I discuss VOT and voicing of stops /p,b,t,d/ and voicing of fricatives /f,v/. Next I analyze vowel length preceding stops. Finally, I look at method of articulation of both stops and fricatives /p,b,t,d,f,v/.

#### Voice Onset Timing

There were variations with /p/ VOTs on the reading list. According to Ladefoged (2001), typical English initial /p/ VOT is approximately 60 ms. On the reading list task, the intermediates matched the native English standard VOT; Somali timing clearly no longer influences them. The beginning group had mean VOTs in the 30s ms, which is similar to all participants' Somali /b/ VOTs. Somali appears to influence VOT in the beginners in English reading list words. Word-medially and finally both groups reached norms closer to native English standards. The intermediate VOTs that are consistently closer to native English norms demonstrate a pattern of learning where intermediates are better able to approximate native speaker timing. The beginners seem to be transferring constraints for Somali /b/ to English /p/.

For the story retell, both groups had longer VOTs than on the reading list. Word-initial and medial stops were longer on this task. However, beginners sometimes did not produce word-final stops; data is lacking for word-final phonemes. The intermediates exceeded both the Somali and English norms for VOT on both tasks in the study which probably has to do with their comfort with the target words.

Voicing /p/ varied a great deal on the reading list. English /p/ is voiceless. For word-initial /p/ the intermediates produced /b/ 18% of the time; this was more frequent than beginners. This phoneme was produced with a voicing bar and a short VOT; native English listeners would interpret it as a /b/. Medially, beginners produced /b/ more frequently, about 50% of the time. Word-finally, intermediates produced /b/ more frequently at 35% of the time. The beginners were following constraints of Somali; their devoicing of initial and final phonemes was the pattern all participants followed in the Somali data for /b/. The intermediates appear to understand that /p,b/ are distinct phonemes in English. They lacked control with the voicing and did not show evidence of internalizing the /p/ voicing pattern in English.

The story retell had samples closer to English norms than the voicing on the reading list. Word-initial and medial samples were produced as voiceless by at all but one participant. Word-finally the beginners did not produce the sound. The intermediates produced voiceless final /p/. This consistency with voicing can probably be attributed to the participants' familiarity with the word 'Pepsi'.

Based on the data, the participants can be successful with English VOTs and voicing when they are familiar with the words such as those on the story retell. Unknown words, as on the reading list seemed to be problematic. Beginners resort to Somali voicing patterns and VOT with unknown words. Intermediates can attain English VOTs with unknown words, but still struggle to produce /p/ as a voiceless phoneme in different word positions. A native English speaker might hear a Somali ELL's /p/ as /b/ because of short VOT that beginners' produced or inaccurate voicing that intermediates produced.

There was a lot of variation with the phoneme /b/ on the reading list. American English /b/ has a mean VOT of 15 ms (Ladefoged 2001). For the beginning group, VOTs were very similar to those for word-initial /p/ on the English reading list. VOTs for both groups increased in the medial and final positions. The beginners' /b/ VOTs were virtually indistinguishable from their /p/ VOTs. Intermediates had lower initial and medial VOTs; they appear to use VOT to distinguish the difference between /p,b/.

I purposely juxtaposed two word-initial /b/ English words to resemble a Somali word. I selected 'bug' and 'book' because they resemble the Somali word 'buug' *book* /puk/. The participants produced similar VOTs for 'buug', 'book', and 'bug'. The one exception was the for the US born participant. She had a VOT of 15 ms for 'book'; her VOT for 'bug' was 25 ms. The US born participant was best able to make a distinction between the two languages; her results do represent a learning curve. She has also been in the US considerably longer than all other participants. The others are not making

distinctions between VOTs in the two languages; they are simply using Somali standards in English words.

The story retell shows a learning curve between the two groups. The pattern for both groups resembled those mean VOTs on the reading list. VOTs were in the 30 ms range and increased as the target phoneme was placed in the medial and final positions of words. As with the reading list, the intermediates are better able to conform to the native speaker VOTs than the beginners. However, both groups were not able to produce word-final VOTs as native speakers do. This is an aspect of Somali English language acquisition that needs further work. The participants may not realize the difference in aspiration (VOT) between the two languages.

The voicing of /b/ did not have consistent patterns for either group. With voicing, the beginners voiced 82% of the word-initial items; the intermediates voiced 33% of the items. Beginners group voiced medial 'b' in 50% of all cases. The intermediate group voiced 'b' in 75% of the items. Word-finally voicing was an issue for both groups. Over 40% of both groups voiced the final consonant. Neither group seems to be able voice /b/ consistently based on the data from the reading list.

All participants were more successful with making voicing distinctions between the words: 'buug', 'book', and 'bug'. The Somali word was devoiced by six of eight participants. 'Book' was devoiced by one participant in each of the two groups. 'Bug' was devoiced by one beginner. Despite the devoicing of Somali /b/ word, nearly all participants were able to voice English phonemes.

Voicing on the story retell had more consistent patterns than those found on the reading list. Beginners voiced at least half of word-initial and medial phonemes. The intermediates all voiced the initial and medial phonemes. Word-finally, beginners did not produce /b/; intermediates devoiced it. The lack of beginning word-final phonemes was probably a result of not having the vocabulary of 'ice cube'.

With voicing, beginners were better able to voice the word-initial phonemes, which I did not anticipate to occur. I thought the intermediates would be better able to voice /b/, but the data proved the contrary. Beginners were better able to make a distinction with voicing whereas intermediates were better able to use VOT. The beginners followed constraints of Somali more closely than intermediates. The beginners produced medial fricatives instead of stops in most cases. The intermediates were able to produce a voiced stop in at least one phoneme out of three. Word-finally neither group was very successful at voicing /b/ as the participants devoiced the majority of the phonemes in this position and followed constraints of Somali where the final stop is devoiced. Both groups seemed to be able to conform to English voicing and timing with familiar words in the story retell than with some of the unknown words of the reading list.

The participants have a native language where devoicing a final consonant is more universal in comparing world languages. Having to learn to voice a final consonant is marked and it goes against language universals for most world languages (Eckmann 1977). The markedness of voicing word-final consonants could explain the difficulty all

participants encountered voicing final consonants. Even the one participant who was born in the US had difficulty with this aspect of English.

In general /t/ was easier to produce than /p,b/. The American standard mean VOT for /t/ is 65 ms (Ladefoged 2001). Word-initially and medially the beginners were under the American norm with 48 and the intermediates were on target with 65. Word-finally the beginners' VOT was on target; the intermediates had VOTs shorter than the American average. Word-initially and medially beginners patterned reading list VOTs after Somali VOTs for /t/. Intermediates produced VOTs as American would. The intermediates' VOTs demonstrate that they have learned native English speakers aspirate /t/.

The lack of word-final 't' in Somali might explain the variation seen in VOTs for word-final /t/ English phonemes. Though Somali ELLs do not have a word-final /t/ in their home language, they do have devoiced 'd' which should sound similar to /t/. It could be that the spelling might confuse them and would therefore cause issues when the participant is reading.

On the story retell the participants had even longer VOTs than on the reading list. Participants had VOT means that averaged around 60. The success reaching mean VOTs similar to American means for /t/ were most likely due to the familiarity of all vocabulary words. The fact that these participants have been able to achieve this with 'vegetable'

probably stems from the fact that they have heard the word frequently produced by native speakers of English.

The voicing on the word list and retell was consistent for both groups. In Somali nearly 100% of the phonemes were voiceless. The consistency of devoicing the phoneme /t/ in all positions of the word show that production of voiceless /t/ must be very similar between Somali and English since nearly every participant produced /t/ accurately.

The differences between Somali and English /t/ are few. Intermediates show a learning curve in that they are able to produce English VOTs more consistently than the beginners. The phoneme in both languages is voiceless, the one difference being that /t/ does not occur word-finally in Somali. Native-like production of VOTs and voicing on the word list shows that the participants are close to mastering English VOT and voicing norms for familiar words. Since voicing still poses difficulty for unfamiliar terms of the reading list, there are still English constraints to learn for both groups.

On the reading list, VOTs for /d/ stops that my Somali participants produced were longer than those of a typical native speaker much as they were for /b/. A native English speaker normally averages an initial /d/ VOT of about 20 ms (Ladefoged 2001).

Beginners had means in the 40 ms. Intermediates had means of in the 30 ms. Somali seems to be influencing the VOTs of words on the reading list since the timing resembles Somali more than English. Distinction between /t,d/ can be heard because the VOT of /d/ is still shorter than those of English /t/.

With the story retell, results were close to those in the reading list. Word-initially beginners had longer VOTs than intermediates. The intermediates demonstrate that they are able to produce /d/ VOTs in a pattern consistent with the reading list. Beginners initial and final VOTs were in the 50 ms. These means are closer to English norms for /t/ than they are to English norms for /d/. I would have expected the beginners' VOTs to be closer to those of the intermediates due to the familiarity of retell target words. Since /d/ VOT is so close to English /t/, the beginners might be misunderstood.

There was some variation with voicing on the reading list. Word-initially all participants voiced over 85% of the items. Word-medially they voiced at least 67% of items; intermediates voiced 100%. Word-finally beginners voiced 13% of their items. The intermediates fared better in this position; they voiced over 60% of all items. There were few beginners who had accuracy voicing /d/. This could easily lead to misunderstanding for beginning ELLs.

Voicing on the retell resembled the reading list. For word-initial phonemes, all participants with the exception of one beginner voiced initial /d/. Word-medially, all phonemes were voiced. The one beginner who did produce a final phoneme devoiced it. Three intermediates voiced final /d/.

Native language interference seems to be affecting the VOT and voicing for /d/, particularly for the beginning group. A short VOT and voicing signal the /d/ phoneme to a native English listener. Beginners produced a longer VOT than American and

sometimes devoiced /d/. An American listener anticipates both VOT and voicing signals from a speaker. When an ELL produces /d/ with neither a short VOT nor a voiced consonant, the listener would most likely interpret the phoneme as /t/. Intermediates demonstrate that they have learned how to produce /d/ in a more accurate manner according to English norms. In addition to the distinction intermediates make with VOT, they are also able to voice accurately voice /d/ in most word environments. This should make it easier for American listeners to understand what is being said.

Production of the voiceless fricative /f/ was very easy. In English and Somali the phoneme is voiced and articulated in the same way. All participants were able to correctly produce the phoneme in all word environments in English. There were no apparent variations from the way it was produced in Somali.

The English voiced fricative /v/ was more challenging for the participants. Word-initially one beginner voiced /v/; two intermediates voiced initial /v/. Medially all participants were more successful with voicing. Beginners voiced at least half the items and the intermediates managed to voice with 75% frequency. Voicing word-finally was the biggest challenge for both groups. The beginners did not produce a voiced phoneme, intermediates voiced less than half. There are probably a couple factors causing variations. The phoneme /v/ does not exist in Somali, so ELLs need to learn how to produce and voice it. A reason for the relative success of the medial phoneme could be due to the medial voiced fricative /β/ in place of word-medial /b/ in Somali words. The

two voiced fricatives /β,v/ sound very similar and the Somalis might be interchanging one for the other.

The learning curve for English phonemes varied substantially. Three phonemes were easily transferable from Somali constraints to English. As we have seen the phoneme /f/ is no problem for Somali ELLs. The VOTs for /t/ phonemes were close to English norms. Producing voiceless /t/ was almost 100% accurate for all participants. While /v/ is more challenging, the intermediates demonstrated that voicing this phoneme can be learned rather quickly.

The three remaining phonemes proved to be challenging for Somali ELLs. Participant VOTs were longer than American targets for /d/. All participants had VOTs close to Somali norms. Voicing word-final /d/ was difficult for all participants. The voiced/voiceless pair /p,b/ caused the difficulty for the participants in attaining American targets. This may be due to the non-existence of /p/ in Somali. For English /p/ beginners approximated VOTs for Somali /b/. The intermediate Somalis overcompensated for VOT on initial /p/ in both the reading list and story retell. The beginners were more accurate with producing voiceless phonemes for /p/ than the intermediates. For /b/ the VOTs approximated Somali as the beginners did for /p/. Voicing caused issues here due to the tendency to devoice Somali voiced stops.

English phoneme /b/ is problematic for Somali ELLs due to Somali phonemic patterns that are transferred to English. The beginners followed Somali constraints and were half successful. The deterioration of /p/ among intermediates showed that they were stabbing in the dark at attempting to produce the correct phoneme. I would have expected the intermediates better able to approximate /p/, but it understanding the difference between /p,b/ almost appeared to confuse the intermediate more than the beginners. The beginners simply followed Somali production for /b/ for both English /p,b/ and the beginners were actually more accurate in producing American phonemes.

### Vowel Length

In English a native speaker lengthens a vowel before a voiced final stop. Somalis have long and short vowels in their home language. The length is indicated orthographically by doubling a vowel to indicate a long vowel. English does not have orthographic markers; 'pat' and 'pad' have a vowel difference without a spelling distinction. Vowel length was examined on vowels preceding stops.

There was a pattern of learning on English vowel length. On the reading list beginners had similar means for short and long vowels. This group did not make a distinction between the two lengths. Intermediates had a very small distinction between their means of short and long vowels. There was a difference of 13 ms between intermediates' averages for short and long vowels; this would not be perceptible to most listeners. On the word list, the beginners actually had a shorter mean for 'long' vowels than for 'short' vowels. The intermediates, on the other hand, made a distinction of 45

ms. The intermediates demonstrate that they have learned the English pattern of vowel length while the beginners do not make a distinction between long and short vowels in English.

### Manner of Articulation

In general the Somali participants correctly articulate the six phonemes under discussion. In English these phonemes keep the integrity in the manner of production no matter where they are located within the word environment. The phonemes are either always produced as stops or fricatives no matter where they are placed within a word. My participants accurately articulated the stops word-initially with one rare slip. The most frequent stop variations occurred in the word-medial position; these stops were sometimes articulated as fricatives, especially for /b/, but also with the other three stops on rare occasion. Word-final voiced stops were usually articulated as stops. However, they were also produced as fricatives when the participants created a liaison joining the word-final stop to the following word. This increased the number of errors for each of the four stops to about 10% of items. The remaining two phonemes, /f,v/, were always articulated as fricatives by all participants.

The number of errors were similar for the two groups. Both groups articulated word-initial English stops as stops. Word-medially the beginners had more difficulty with the /p,b/ errors than the intermediates did. The intermediates had an error with a /t/ phoneme. Given that medial /t/ is not articulated as a fricative in Somali, that mistake is probably just random. The intermediates had three times the number of mistakes than the

beginners. The intermediates joined the final stop to the following word with a liaison.

The result was frication of word-final /b,d/ in some of the intermediate items.

The beginning participants seemed to be influenced by their home language. Incorrect production of stops as fricatives was more common word-medially and more common with /b/ than with /d/. Looking at the stops, there were a few mistakes word-initially and finally. Word-medially /b/ was articulated as a fricative in a quarter of all phonemes. The phoneme /d/ was articulated as a stop in 10% of all words. This is consistent with Somali language rules as demonstrated by my participants on the Somali word-identification task. The participants understand that Americans produce medial stops because they produced word-medial fricatives less frequently than on the Somali words. They are attempting to conform to English rules. Little evidence exists that there is a learning curve for the participants because both groups of participants made errors and the intermediate group frequently made more errors in manner of articulation than the beginners.

The participants seemed to be more successful on the story retell. This task contained words with which the participants were familiar. The beginners produced /p,b,t,d/ as stops with the exception of one medial fricative. The intermediate group produced /p,b,t,d/ as stops in every environment within an English word. As with the reading list, all participants articulated the two fricatives /f,v/ correctly in each position of the word.

The retell increase in accuracy over the reading list probably stems from familiarity with the target words. Both beginners and intermediates were successful producing stops /p,b,t,d/ even in the word-medial position. The reading list had a greater number of unknown words that the participants may not have heard previously. They would have to rely heavily on decoding skills to correctly produce the words whereas with the story retell they could easily identify a picture of a cat or a hamburger.

The discussion covered three areas. The first was how the participants' phonemes differed from standard American English. The second was how the two groups of participants compared to one another. The final aspect was how English words compared to Somali words. The participants had difficulty shortening VOTs of voiced stops /b,d/ in English. Their phonemes had VOTs that were close to Somali lengths instead of English lengths. The biggest challenges that the participants faced revolved around the phonemes /p,b/. Going back through the discussion, the VOT and voicing presented the greatest errors as far as first language interference in production of the target phonemes for both beginning and intermediate participants. In contrast to the variations of /p,b/, phonemes for /t,d/ were fairly consistent. VOTs were closer to targets for both groups and voicing was consistent with American norms. Vowel lengths for these phonemes did not have the variations as those of the former pair of phonemes. Manner of articulation was an issue word-medially as the participants tended to produce word-medial fricatives, /β,ð/, instead of stops, /b,d/. The fricatives, /f,v/, were always produced as fricatives in English

although the voicing for /v/ was not always apparent in the samples due to the language interference of Somali. For the beginning group, the results resembled the Somali phonemic norms more than English norms. The intermediate group was able to produce phonemes closer to native English speakers; however, there were lingering influences of the non-existence of /p,v/ had on the intermediates' English speech samples.

In this chapter I reported the results of the data collection: the Somali picture identification, the English word list, and the English story retell in terms of VOT, vowel length, and manner of articulation. I followed with a discussion of participants' English phonemes compared to Standard English as reported in literature, differences between beginning and intermediate ELLs, and differences between participants' phonemes in Somali and English. I concluded the chapter with a analysis on which English phonemes had positive transfer and which English phonemes were challenging due to native language interference. In the following chapter I discuss implications of the study on teaching Somali ELLs and ideas for further research.

## CHAPTER FIVE: CONCLUSION

I am researching how the phonemes /p,b,t,d,f,v/ are affected by VOT, vowel length, and manner of articulation when produced by Somali ELLs in both Somali and English. I would like to know if there is a difference in the way in which Somali ELLs and a native speaker of English produce these six phonemes. Finally, I am curious to find out if there is a learning curve that occurs as ELLs spend more time in the US; I am comparing beginner to intermediate English samples.

In this final chapter I answer these questions from the study results and compare the findings to information from the literature review. I discuss limitations of the study, recommendations for future research, implications, and disseminating results. I conclude with a reflection on the study.

### Literature Revisited

Several different patterns emerged from the data. Some phonemes were easily transferred between Somali and English. Other phonemes presented a challenge for beginners, yet intermediates demonstrated that there is a learning curve. Finally, a few phonemic aspects were challenging even for Somalis who had been in the United States for many years. In general, the participants were able to produce English phonemes more accurately on the story retell than on the reading list. This is probably due to familiarity with many of the terms used in the story retell.

My results support the ease and difficulty of language acquisition can be explained partially by the contrastive analysis hypothesis (CAH) (Eckman 1977). There was ease of transfer for some aspects such as /f/ and /t/. Participants did not have any errors in production of English /f/. All participants produced /t/ as a voiceless stop accurately in the majority of samples.

There was evidence of positive transfer with in some cases and interference in others. English voicing of word-final consonants /b,d/ is marked, or not a language universal; this has proven to be a challenge for my participants. Beginners devoiced these two consonants in more than 60% of all samples. However, the results showed that certain aspects can be learned over time. Intermediates were more successful at voicing final stops. The latter had reset their language constraints to include both Somali and English in their phonemic schemata. Despite the challenge of a marked aspect in the target language, language learners can gain more native-like production of phonemes.

The results of the current study support Eckman's (2003) theory of phonemic pairs. The relative ease and difficulty my participants had with the English phonemes /p,v/ supported his theory. Eckman et al stated there were three situations in which second language learners acquire phonemic pairs and two apply directly to my research. The easier situation is a target language phonemic pair where one phone occurs in the native language like the voiceless Somali phoneme /f/. The beginners had difficulty learning voiced /v/ that does not occur in their native language. Intermediates produced it

correctly most of the time. This demonstrates that the second half of a pair can be acquired over time.

Eckman et al stated the most difficult part of phonemic pair acquisition was the allophonic split. The paired split consists of allophones in the native language and two distinct phonemes in the target language. As I listened to Somali samples, I realized the participants were using Somali 'b' as an allophone of /p/. In the word-initial position they often produced /p/. Word-finally they always produced /p/; I interpreted the final 'b' consonants on Somali words as an English /p/. For 'hibil' *meat* all participants sounded like they were saying /hilip/ in a manner that resembled saying the name 'Philip'. It seemed to me that the issue with Somali ELLs /p,b/ confusion was attributable more to this allophonic split and less to just the non-existence of the /p/ phoneme in the Somali phonetic inventory.

Flege (1980) found that his Arabic participants who also do not have /p/ in their phonetic inventory struggled with VOT and voicing much as my participants did. Flege concluded that his learners did understand that English /p/ is a devoiced Arabic /b/, but Flege's subject struggled to produce the correct /p,b/ phoneme. I believe that my participants do understand that their 'b' phoneme is two distinct phonemes in English. The beginners seemed to rely heavily on producing English 'p' samples as they would produce orthographic 'b' in Somali. English 'p' samples word-initially and finally were almost always voiceless while the word-medial samples were voiced. The four beginners

produced 'pat' and 'pack' correctly. Intermediates had more incorrect English 'p' samples, but I attribute that to the fact that they are attempting to reset their schemata and voice word-initial and word-final English /p/ phonemes which is the polar opposite to the constraints of their home language. For the words 'pat' and 'pack' one of the four intermediates voiced the 'p' phoneme; with the words 'book' and 'bat' half of the intermediates produced voiced phonemes, the other half produced voiceless. The intermediates' voicing of English 'p' seems to be a developmental error in overcompensation of the rule that they are attempting to assimilate just as they did with long VOTs for /p/. Another similarity that my participants had with those of Flege's was first language interference in length of VOTs before stops. My participants tended to lengthen /b,d/ to Somali norms; Flege's subjects shortened /p,t,k/ VOTs to Arabic norms.

Finally my results contradict Stibbard (2004), who found a marked distinction between samples read from a word list and those samples that were taken from an authentic discussion. Stibbard found that participants were overly correct reading from a list, used by Hung (2000), and that Hong Kong ELLs made more errors in natural speech. Part of my triangulation of data provided that I would have samples from both sources: a reading list and authentic speech. My participants generally had better accuracy attaining English VOT means, vowel length, and correct articulation on the story retell. This could be attributed the familiarity with words on the retell. Those on the reading list were often unknown. Also I had a much smaller sample size for the retell than for the reading list. These two factors may have made a difference as well.

### Limitations

My study had four limitations. First, I would have preferred a longitudinal study to follow the same group of participants over several years of English acquisition to find out how they improved with integrating English norms into their schemata. However, given constraints with time and money, it was not feasible. The ELL population, in most school districts, tends to be rather transient. Families often move to find a better job, to find more affordable housing, or to be closer to family. Secondly, it was difficult probably given the young age of my participants for them to feel completely comfortable working with a stranger. Thirdly, the environment also meant that I had little input into which participants were chosen. Ideally, I would have liked to have preferred participants who had little experience with the /p/ phoneme in a language other than English. All my participants except for the girl born in the US spoke Swahili in addition to Somali. The results may have been different with students who had no prior knowledge of a second language that has /p/ in the phonemic inventory. Finally, the size of the study was small; I had eight participants. There were certain phonemic issues with which every participant in the study had difficulty; these are the areas that I have focused on as potential issues for Somali ELLs. Other issues fall between positive transfer and interference. I see these areas as areas for research in the future with a large number of participants.

With regard to the design, I had three limitations arise. First, working with minimal pairs between both languages would have helped isolate what was specifically challenging for the ELLs. The closest I came to finding a minimal pair was ‘buug’ *book* /puk/ in Somali paired with English samples ‘bug’ and ‘book’. A researcher with more

knowledge of Somali might do this. Secondly, I would have preferred samples where participants interacted with their peers in an informal information sharing or partnered activity. This would have provided an informal speaking environment to contrast the more formal reading list. Finally the multi-syllabic samples in Somali were an issue with VOT and vowel length. Somali is a synthetic language and has a number of multi-syllabic words. Trying to find one-syllable words was very difficult. Multi-syllabic words presented a challenge in that the stressed syllable was always lengthened and therefore the part that I measured when I looked at vowel length.

#### Further Research

Somali is essentially an unexplored language, and there is much to uncover to assist ELLs with language learning. There is more work to complete on the phonemic level. Further research into /p,b/ should take place with a larger number of participants. The full range of English stops /p,b,t,d,k,g/ should be examined to verify that the /p,b/ issues do not apply to other English stops. It would be most beneficial to compare minimal pairs in Somali and English involving /p,b/ words to attempt to pinpoint if phoneme position within a word makes a difference. A comparison of Somali ELLs who have a second language with a /p/ phoneme (other than English) to those that do not might also lead researchers to better predict the most challenging aspects of this phonetic pair.

Though not as difficult as /p,b/, medial articulation, final voicing, and vowel length also challenged the participants. Somali has a word-medial voiced stop that

resembles /g/ which is produced as a fricative in Somali. A comparison should take place with English word-medial /g/ to see how ELLs articulate it. Word-final voicing is a challenge for many ELLs. My participants had difficulty voicing word final /b,d/. This is an aspect of ESL that could use further study. Somalis understand difference in vowel length, but it might be useful to research methods in which to assist beginning Somali ELLs understand English patterns of vowel length. This is an area where results might differ from mine if a large number of participants were used.

#### Implications

Three important findings should be explicitly taught to Somali ELLs based on finding of this study. The first is the contrast between /p,b/. All participants had difficulty producing these two phonemes correctly in all samples. They tended to rely on Somali VOT and voicing rules for /b/ in order to produce the sounds for unknown words. Intermediates were better able to make a distinction between the phonemes on known words such as Pepsi and bike. However, unintelligibility can occur with when the two consonants constitute minimal pairs such as bush and push. Based on my results of voicing and VOT, Somali ELLs would be best served by explicit teaching on distinguishing /p/ from /b/. They need to know that /p/ is always voiceless and /b/ is always voiced no matter where the phonemes occur in an English word. English /p/ is produced with more aspiration than English /b/, hence the difference in VOT. The VOT of Somali /b/ falls between the VOTs of English /p,b/. Somali ELLs will need to learn to

lengthen an English /p/ and shorten an English /b/ in order to reduce accent and increase intelligibility.

The second important finding was voicing word-final stops. All participants struggled to produce word-final voiced /b,d/. The beginners produced final voiced stops as their voiceless counterparts /p,t/ in the majority of samples. The intermediates also made errors in voicing final /b,d/ particularly with unknown words. As with /p,b/, many minimal pairs exist with the pairs /t,d/. Somali ELLs need to learn how to voice word-final phonemes so they are not misunderstood.

The final important finding concerns lengthening vowels that precede a final voiced stop. While vowel length is not as critical to intelligibility as the contrasts between paired consonants, both groups did struggle to demonstrate mastery of this particular aspect of English phonetics. Somalis have long and short vowels in their native language, so they are not being introduced to a new concept. The lengthening of vowels preceding a voiced stop in English is more subtle than Somali vowel length so beginners did not make a distinction. Intermediates were capable of lengthening before voiced stops in known words. These three aspects appeared to be the most difficult to acquire based on the number of errors that beginners and intermediates made.

#### Disseminating Results

The results of this study will reach a larger audience through three different organizations. The district where I conducted my research received a copy of my study. Hamline University published the study online. Finally, I shared results from my study

with other ESL teachers in my district, especially those teachers who have or have had Somali ELLs.

The results are useful to ESL Teachers in the K-12 setting and also Adult Education. The three aspects that could cause most major misunderstandings need to be addressed explicitly in ESL education. I do not think that Somalis are going to just 'pick up' the phonetic distinctions of /p,b/ in English. One way to achieve this is to complete some exercises where ELLs can visibly demonstrate how much aspiration is produced for a stop. Holding a string, tissue or flame in front of the mouth can show a learner if she is aspirating. They can practice exercises with voiced/voiceless pairs and feel their vocal cords move on voicing and attempt to transfer this to /p,b/. These techniques can be used for voicing word-final pairs as well. These aspiration exercises can be used with ELLs of many backgrounds. All ELLs could benefit from recognizing aspiration and where it occurs in English. Teachers can include at spelling words /p,b/ on lists. They can practice minimal pairs in partner activities either with word games or map activities. Having students practice holding vowel lengths preceding word-final voiced stops may assist them in appropriately lengthen vowels in English. Writing words with an orthographically larger vowel and then exaggerating the sound aloud may help to set the pattern to memory.

#### Reflection

I am very pleased with the results of the study. I originally had one burning question concerning /p,b/ confusion. At the beginning of my research, I thought I would

be able to find some definitive answer to explain the error. I found the research to be a mystery because the further I dug, the more questions appeared. There were myriad reasons to explain how a single phoneme can sound so different between two languages. I found that in addition to issues concerning /p,b/, there were issues with VOT, vowel length and manner of articulation for phonemes that I had not previously considered to be problematic for Somali ELLs, for instance /d/. I have gained a much greater appreciation for phonetics. I have become inspired to continue research with phonemics. I am considering applying to PhD programs.

I have gained a greater understanding of Somali history. My heart goes out to the families that have had to relocate around the world, often breaking up as they do so. To add to this challenge, many Somalis have migrated a second or third time often to non-Muslim western countries. I realize that nearly all of my Somali ELLs have learned to read and write in a second language before learning to write in their native language. I realize how challenging that must be, particularly for a very young child. I find the resilience of these students inspiring.

I am more acutely aware of my students' pronunciation errors than I was when I commenced researching phonetics. I can now hear a difference between an aspirated and unaspirated /p/. I let my students know that unaspirated /p/ might sometimes be mistaken for a /b/ at the beginning of a word by an American listener. To counter this, I now devote time to explicitly teaching aspiration (particularly for word-initial stops). In

general I devote more time to teaching phonetics in my curriculum than I did before starting my research.

I have shared my research topic with some of my ESL colleagues as I completed this study and I have been encouraged by their comments that they have had similar experiences with the /p,b/ for Somali ELLs. One co-worker recounted her experience with a university-educated Somali translator who had a superior command of English, yet she sometimes did not make a distinction between /p,b/. I believe that all educators are interested in their students' progress. I hope my research helps my colleagues who also work with Somalis.

I think back to Fatuma's difficulty with /p,b/. I believe with explicit training in when to use each phoneme, she would have been more successful with producing the correct phoneme. I now see why she was guessing at spelling in her papers. She was probably in the same situation as my intermediate participants who guessed at when to voice /p,b/. I do not believe either Fatuma or my participants are able to really discern a clear difference between the two phonemes. Success on the target words in the retell was correlated to familiarity while the true test of mastery of the phonemes was revealed in the reading list. The intermediates still had difficulty figuring out which phoneme to use and need further instruction.

While there is no overnight cure to assist an ELL with acquiring English and resetting her language schemata to English norms, explicit training can help ELLs learn to recognize where they may be most likely to be misunderstood. It is our duty as ESL

teachers and stakeholders in the educational process to assist all students to be successful in finding work. We need to help Somalis understand English and be understood by native speakers of English so that they are able to communicate effectively with peers, professors, clients, or with whomever they speak. Somalis are one of the three main ethnic groups in the Twin Cities metro area and we need to help them become independent and successful.

APPENDIX A

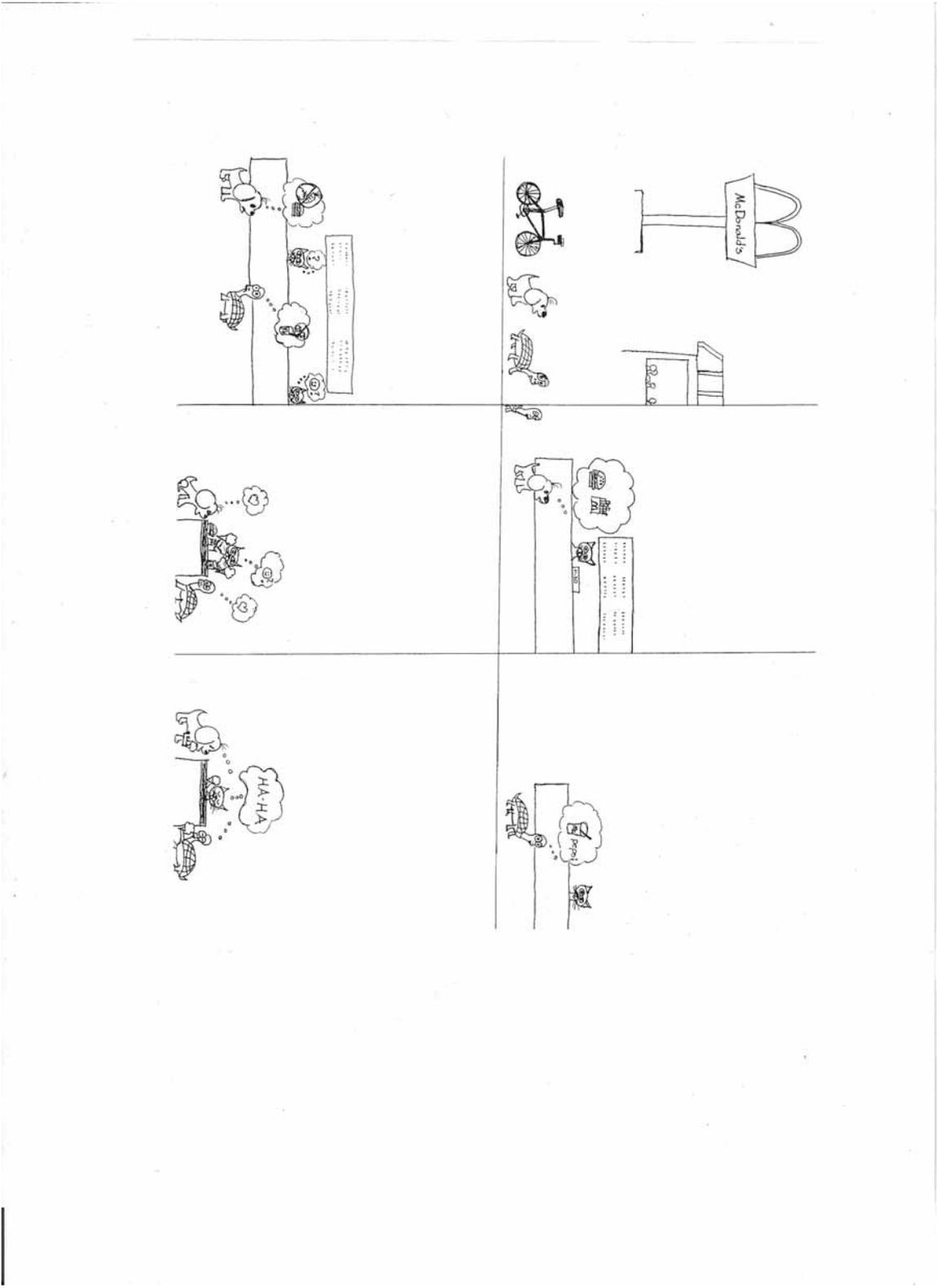
English Word List

bug	hopping	cab
pug	bobbing	cap
tub	bubble	hit
dub	topple	hid
face	living	rip
vase	laughing	rib
pat	even	have
bat	effort	half
fine	heaven	feet
vine	effect	feed
book	pebble	tap
pack	pepper	tab
view	indeed	five
few	atone	fife
tusk	eaten	seat
dusk	hotel	seed
ton	meadow	save
done	padded	safe

## APPENDIX B

### Story Retell Word List and Sample Picture

Pepsi	Pepsi	cup
Bike	hamburger	cube
Turtle	vegetables	cat
Dog	McDonald's	ride
French fries	French fries	laugh
Vegetables	having	love



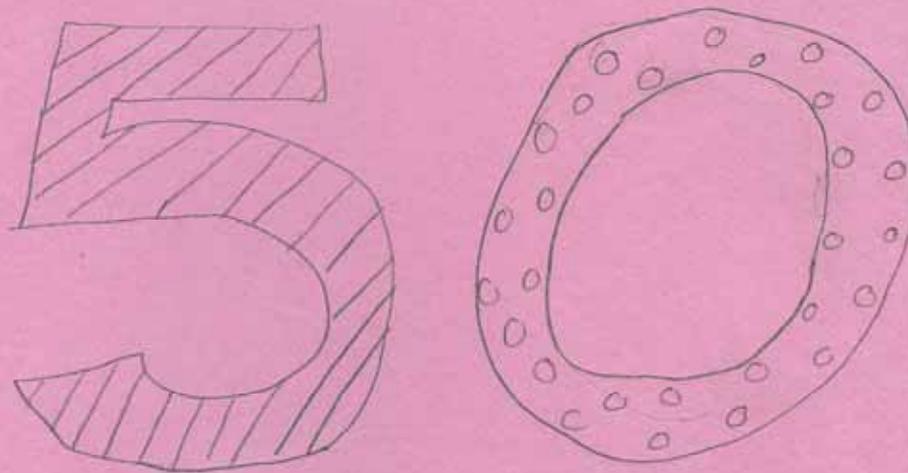
## APPENDIX C

### Somali Word List and Sample Picture

buug	to <b>ban</b> <sup>3</sup>	hib
basali	to <b>ba</b>	kab
buluug	abeh	koob
<b>di</b> yaarad	to <b>d</b> oba	di <b>ya</b> arad
dibi	si <b>d</b> eed	si <b>d</b> eed
dooro	saddex	koofiyad
toban	konton	
<b>to</b> doba	takhtar	
tufaax	hotel	
far	afar	laf
fiyare	koofiyad	hasif
fure	tufaax	

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<sup>3</sup> Bold indicates the specific phoneme that was analyzed in each word.



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