Perceptions of English Segmental Phonemes by Ethiopian EFL Learners Speaking Amharic as a First Language

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***Abstract**: This study investigated native Amharic speaking Ethiopian EFL learners' detection and recognition of English segmental phonemes, which are foreign to their first language Amharic, and yet that are used distinctively and functionally in the target language input. The study targeted English vowels and consonants tentatively predicted as contrastive based on problem areas of English pronunciation for Amharic speaking learners. These are short vowels /æ, ʌ, ə, ɒ/; long vowels /i:, a:, ɔ:, u:, ɜ:/; diphthongs /eɪ, aɪ, ɔɪ, aʊ, əʊ, ɪa, eə, ʊə/; and consonants /θ, ð/. Sixty undergraduate students who speak Amharic as native language participated in this study by completing forced auditory tasks after listening to audio stimuli that presented target sounds in minimal pairs. The result showed that overall, English segmental phonemes that are foreign to the native language Amharic still exert severe perceptual difficulty for the learners even after more than twelve years of learning English. The findings also considered communication constraints that could stem from the learners' difficulty to distinguish foreign English phonemes, and to make meaning out of them in spoken English. This was evident in the learners' considerable failure to recognize the most familiar words in English when presented with English segmental phonemes. Findings of this study support particular attention and focus in EFL teaching on English pronunciation aspects which are foreign to the learners' native language, the importance of balancing perceptual as well as productive skills, and the need for developing L1-based, and empirically informed pronunciation syllabus for Ethiopian learners rather than using generic and intuitively produced pronunciation training materials.*

Keywords: *phonological interference, speech perception, segmental phonemes, interlanguage, pronunciation learning, Amharic native speakers*

Introduction

Empirical and experiential evidence in the field of teaching English as foreign or second language (EFL/ESL) demonstrates the importance of

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pronunciation to the learners while learning a foreign language. As Stern (1992, p.116) puts it, "The value of pronunciation for learning the language is pervasive, and the teaching of pronunciation under any circumstances cannot be regarded as a luxury one can easily dispense with." Both production and perception of speech sounds (i.e. pronunciation) characterize communication, and hence flaws in pronunciation (productively and perceptually) can impair a great deal of communication. The detrimental role that pronunciation flaws can have in communication has been evident in Jenkins's (2000, p.20) research which resulted in pronunciation as "... by far the greatest factor in unintelligibility, and as a – probably – *the* critical factor in unintelligibility." (emphasis in original)

A major question that has occurred frequently in the second/foreign language phonology literature has been how to explain the phonological errors and learning difficulty. One of the earliest theories known as the Contrastive Analysis Hypothesis (CAH), as thoroughly discussed by James (1980) from theoretical and practical perspectives, holds that learning difficulty and errors in the target language can be predicted by a systematic comparison between the native and the target languages. According to this theory, the area of the languages that only partially overlaps or that does not overlap at all will be a source of difficulty for the L2 learner. However, the predictive power of Contrastive Analysis Hypothesis has been seriously questioned because of the empirical evidence accrued through research studies. Such research depicts actual use of the target language by the L2 learner demonstrating that errors committed are not only accounted for by native language transfer but also by other factors including the native language which is realized at different levels by different learners. Of particular interest in the present study, are actual perceptual difficulties of English segmentals for a group of Ethiopian learners because they can help inform us not only about the types of errors that occur but also about the relative perceptual difficulty of English language sounds.

Many EFL learners confront difficulties in learning and using English pronunciation; the extent and type of such difficulties learners encounter in mastering the target pronunciation vary across groups mainly in terms of the respective native languages and social experiences of the learners as well as other elements of context (Jenkins, 2000; Levis, 2005).

The influence of the learners' mother tongue on the learning of second language (SL/L2) or foreign language (FL) has long been acknowledged since the introduction of Contrastive Analysis Hypothesis (CAH). As James (1980, p.v) notes, "Nothing seemed of greater potential value to language teachers and learners than a comparative and contrastive description of the learner's mother tongue and the target language." Research in second or foreign language (SL/FL) teaching and learning has shown continued emphasis on contrastive analysis-based investigation of second language pronunciation learning, and this has influenced the field and teachers to sustain their belief in the important influence of the mother tongue (Jenkins, 2004, p.113).

According to James, contrastive descriptions only predict part of the learning problem because those points of contrast cause various and variable problems among different learners, and between the production and perception of the target language (1980). In other words, phonological problems depicted by contrastive studies may be realized at different levels by Amharic native learners in their actual use of English depending on learners' exposure, instruction, and experience, and a number of other interlingual factors.

Furthermore, the interest in contrastive analytical investigation on learners' pronunciation has emerged these days balanced by an equally vigorous interest in interlanguage phonology to verify the actuality and manifestation of contrastive-based problem areas in actual use (Jenkins, 2004). This is because "contrastive descriptions are only able to predict part of the learning problem" (James, 1980, p.2). That is to say, from a psycholinguistic point of view, potential difficulty areas that contrastive descriptions can predict cause various and variable problems among different learners, and between the production and the perception of the target language. James (1980, p.2) points out that SL/FL learners have idiosyncrasies or a complex growing system of the target language unrelated to either the mother tongue or the target language, which is often described in the field as interlanguage.

In account of learners' interlanguage phonological system, the literature has documented a large body of research that incorporated actual perception and production constraints in second language phonology that also arise from a number of interlanguage factors including social, developmental, universal, psychological, instructional, etc. More recently, there is a reasonably growing interest to address pronunciation

needs of learners to prepare them for real life interaction with the target language in a variety of contexts (Levis, 2005).

Helping students learn English pronunciation, therefore, should begin with understanding pronunciation varieties that students possess while acquiring English. This indeed highlights the need for investigating specific tendencies for a particular group of learners, like the present study attempts, and to use the result for improved and more directed pronunciation teaching. The literature on Ethiopian EFL teaching/learning, however, provides surprisingly scanty focus on learners' interlingual pronunciation abilities and related difficulties while the area has enjoyed a considerable attention by researchers in ESL and EFL contexts around the world. Research on Ethiopian learners' pronunciation has much to explore from learners' perceptual experiences as it has from production perspective. In this view, Levis (2005) asserts that "... pronunciation teachers need to think more about how learners perceive speech rather than relying solely on NS [native speakers] perceptions" (p. 373).

The present study advocates the importance for more research to enhance our knowledge about the nature of learners' pronunciation difficulties in learning as well as using the effects of pronunciation difficulties on communication. Research of this type presumably has much to offer to teachers and students in terms of setting goals, identifying appropriate pedagogical priorities for the classroom, and determining the most effective approaches to teaching.

Due to the fact that pronunciation is first language bound and Ethiopia is a multilingual country, a systematic investigation of English language pronunciation difficulties given the context of Ethiopian learners' respective first language background could prove to be a significant contribution to English language pronunciation teaching in this country. It is crucial to first deal with one of Ethiopia's major languages. Therefore, this study investigates English segmental phonemes for Amharic speakers in terms of actual perception of spoken English. Unfolding learners' perception performance of foreign segmental phonemes in spoken English, this study is therefore to answer the following research question: To what extent do contrastive-based segmental phonemes of English militate against Amharic native EFL learners' actual perceptions of spoken English?

Following the literature reflecting a deeper understanding and concern towards the role of the native language and interlanguage factors in having an effect on the learning of new pronunciation and its use in spoken communication (Jenkins, 2000), the present study synthesizes typical trouble-spots that Ethiopian learners, speaking Amharic as first language, experience in learning English pronunciation. The study is hoped to play a preliminary role in initiating new directions and thoughts in the teaching of English as a foreign language in Ethiopia and to propose improvement for the existing approach towards offering systematic and directed pronunciation teaching on the bases of learners' needs as a way of ensuring better communication. The objective of the present study is to closely examine Amharic native learners' aural difficulties with English segmental phonemes, and verify if contrastive-origin segmental problems militate against learners actual speech perceptions.

Method

As Brown (1997) elaborates, successful acquisition of the new phonological representations requires accurate perception of distinctive phonemes and their contrasts in the target language input. In L2 phonological acquisition theory, acquisition of the relevant phonological structure is triggered by the learner's detection that a sound is used distinctively or contrastively with another one (Brown, 1997). Moreover, for example, if the learner is to acquire the phonological structure required to differentiate /l/ and /r/ in English grammar, then the learner must notice that minimal pairs, such as *right* and *light*, are distinct words. Thus, to gain a better appreciation for the successful learning of L2 phonology, one requirement is to consider the ability to discriminate utterances of one word type from those of another word type (e.g., *bat* from *pat*) (Jusczyk, 2008, p.229). Adopting procedures used by previous speech perception tests, this study designed a test that asked the participants to discriminate and recognize pairs of words that minimally contrast English segmentals, which are novel to their Amharic mother tongue.

The research design of the present study is quantitative descriptive because the study examined learners' perceptual difficulties in foreign segmental phonemes while learning or using English pronunciation. Furthermore, the study sought answers to the questions without any attempt to manipulate variables or train the participants and measured

and analyzed data numerically based on the frequencies that fall under pre-defined phonemic and phonological features of English pronunciation.

Participants

Sixty Amharic native speaking undergraduate students (27 males, 33 females) with the mean age of 19 years participated in this study. According to self-reported personal information, all participants speak Amharic as first language; attended pre-university schooling in government schools, and had no significant prior exposure to native English speakers. Sample selection procedures the study employed were based on a personal information questionnaire prepared for this purpose. In other words, the participants were selected from their groups purposely because their native language is Amharic according to self-reports collected from personal information questionnaires.

Target Features in the Speech Perception Test

A closer look at differences between English and Amharic phonologies reveals that the two languages are very dissimilar in many respects and do not have many phonological features in common. However, there are some segmental (e.g. /b/, /d/, /g/) and suprasegmental (e.g. grammatical function of intonation) which are found in both languages, and some are only found in the target language (e.g. interdental fricative consonants (segmental) and weak forms of vowels in unstressed syllables (suprasegmental)). Given this variation, English segmental phonemes lacking in Amharic were included as the perceptual targets in this study: short vowels (æ, ʌ, ə, ɒ); long vowels (/i:/, /a:/, /ɔ:/, /u:/ and /ɜ:/); diphthongs (/ei/, /ai/, /ɔi/, /au/, /əu/, /ia/, /ea/ and /ua/); and consonants (/θ, ð/).

Stimuli Preparation

Many researchers on speech perception prepared the stimuli making their own recordings of native speakers or proficient non-natives speaking or reading aloud speech materials containing target pronunciation features under investigation (Italo, 1988; Moustofa, 1979). The present study adopted native speakers' recordings already available in popular English pronunciation textbooks such as O'Connor (1980), Roach (1993) and Kelly (2000). The stimuli were designed under two phases. For each target pronunciation feature under investigation, scripts of the speech

were first extracted in the source books. They comprised sets of non-contextualized minimal pairs that contain target features contrasting them with other features (e.g. interdental fricative /θ/ with dental fricative /s/. Afterwards, using computer aided sound editing software, relevant speech extracts particularly exhibiting target pronunciation features were digitally selected from the original audio materials and saved as a separate file for further preparation of the test. Then selected speech extract for each item of the test was further arranged and organized in the required order and sequence and saved separately as audio stimuli. A sequential introductory number followed by 500 millisecond silence was inserted at the beginning of each item, while the whole audio file was optimized for normal audio level in order to obtain equivalent overall amplitude level.

Speech Perception Tasks

To assess the ability of the participants to discriminate or identify words from a pair of words differing or contrasting in only one phoneme, a forced word discrimination (identification) task was employed following previous speech perception research such as Brown (1997), Watcyn-Jones (2002) and Halle et al. (1999). The assumption behind this kind of task is that accurate perception of a phonemic contrast is necessary for successful acquisition of non-native sounds (Brown, 1997). If the learner detects that two segments are used contrastively in the words, he/she has successfully acquired the new phonological representations. On the other hand, if a contrast between two foreign sounds is not perceived, the learner would identify either the wrong word or both words, or become unable to decide, and thus the learner does not yet distinguish those segments in his or her interlanguage grammar.

The forced word discrimination task presented 42 minimal pair items divided into two sections. The first section which comprised 22 items required participants to listen to minimal pairs and decide which one they heard. Participants were presented with a pronunciation of one of the words (e.g. 'pat') and two words to read (lexical representation) (e.g. pat/pot) from which only one word corresponds to what they heard. The participants' task is to indicate which of the words given in the answer sheet matches the one they heard. A response sheet with the words representing what they heard (e.g. pat) and the corresponding words differing in only one phoneme (e.g. pot) was given to the participants to read and choose one. In other words, for each word that the participants

had heard (e.g. pat), they had to circle the right word from the corresponding minimal pair (e.g. pat/pot) in the response sheet.

In the second section of the forced word identification task, another 22 minimal pairs were used. This time, the participants were given (in the response sheet) one of the words (e.g. thin) of the minimal pair (e.g. thin/sin). In other words, the participants would read a word on the response sheet and then hear minimal pairs (e.g. 1-thin, 2-sin), with a few seconds interval. For each word the participants had read, they had to circle one of the two numbers (e.g. the number "1" or the number "2") on the answer sheet to indicate whether the given word matched the first or the second pronunciation in the audio.

In order to successfully complete both tasks, a participant must refer to his or her internal phonological representations of the words he/she heard and determine which lexical representation corresponds to the verbal stimulus. If the correct option from the minimal pairs is chosen for the representations of the target words, it indicates that they have the necessary phonological perceptual representations of the target sounds (e.g. /θ/ and /s/). If the participants selected the wrong word, or selected both of the options, or were unable to decide on one, an error score was given and thus interpreted as he or she did not yet have the necessary phonological representation and thus unable to determine to which word the verbal cue corresponds.

To assess the extent of perception errors the participants committed, and to obtain the final inventory of difficulty areas, the total incorrect score each sound item received was changed to percentage scores based on the total number of 60 responses from the participants. Similarly, mean percentage error score that each target received was computed and analyzed relative to scores for individual target features included in the test.

In the meantime, an attempt was made to increase the reliability of the data by developing multiple items on the same target in such a way that participants performed a couple of tasks namely forced discrimination and identification tasks that made up an overall measure for the group. Additionally, the items constituted multiple stimuli that presented the target phonemes at different positions that measured learners' experiences at different points in the target language input.

When analyzing the data, the researcher and his colleague made the coding for the same text so that comparisons could be made between the two sets of coding. Coding differences reworked whenever they occurred between the two coders. This was done to increase the reliability of the data by confirming that repeated analysis of the same data produces the same findings (codes).

Results

Each of the 2520 responses (42 items x 60 participants) was coded for 1) correct word identification and 2) incorrect word identification. A response that corresponded to the word they heard on tape was counted as correct and a response that did not match the stimulus was counted as an error. Total incorrect scores on short vowels, long vowels, diphthongs and consonants were tabulated separately for statistical analysis. Tables 1 and 2 below indicate the learners' overall incorrect word identification performances for each sound group and their total perception result for the whole target segments included in the test.

Total mean percentage score for incorrect word identifications as a whole represented 42% of the total responses. Also, with only 10% (Table 1) of the students with scores above 70% correct, it shows that the majority of the learners had acute difficulty in discriminating English target sounds covered in the test.

Table 1: Incorrect perception frequency distributions for sound items and total scores (N=60)

% of errors	Short vowels	Long vowels	Diphthongs	consonants	Total segmental errors
100-90	-	-	-	1(1.7)	-
89-80	-	-	-	1(1.7)	-
79-70	5(8.3)	2(3.3)	3(5.0)	4(6.7)	-
69- 60	4(6.7)	8(13.3)	1(1.7)	6(10.0)	4(6.7)
59-50	7(11.7)	21(35.0)	6(10.0)	26(43.3)	14(23.3)
49-40	-	14(23.3)	6(10.0)	15(25.0)	20(33.3)
39-30	17(28.3)	8(13.3)	27(45.0)	2(3.3)	16(26.7)
29-20	20(33.3)	6(10.0)	8(13.3)	2(3.3)	5(8.3)
19-10	6(10.0)	1(1.7)	3(5.0)	3(5.0)	1(1.7)
9-0	1(1.6)	-	6(10.0)	-	-
Total	60 (100)	60 (100)	60 (100)	60 (100)	60 (100)

(1) Figures in parenthesis indicate percentage.

(2) Example, for short vowels, 5 learners scored between 70% and 79%.

The total test score, as presented in Table 2 below, also shows that from the 42 minimal pair items that each of the 60 participants heard, each participant on average failed to discriminate 18 of the minimal pairs (42%). In other words, the students heard almost half of the novel English sounds and their non-novel counterparts as the same. Furthermore, with many of the participants (20 or 33%) receiving 40%-50% error score, it seems that the task presented moderate difficulty for the majority. For a number of reasons, the results show that contrastive-origin segmental problems still continue to cause considerable difficulty in the learners' actual perceptions. This may not be unexpected given that much research on phonetic and phonological influences on second/foreign language learners' perception of English segments has reminded us consistently that phonological contrasts that are not employed contrastively in the native language are difficult for the learners to acquire unless they get used to them somehow, either through instruction (Bradlow et al., 1997) or experience (Flege et al., 1997; Halle et al., 1999).

Table 2: Descriptive statistics for sound items and total segmental scores

		short vowels	**long vowels**	**diphthongs**	**consonants**	**total error**
	N	60	60	60	60	60
	N	8	9	13	12	42
% of error		36.4	48.1	34.3	50.8	42.4
Mean		2.9	4.3	4.4	6.1	17.8
Std. Deviation		1.4	1.3	2.1	1.8	4.5
Range		6.00	6.0	10.0	9.0	20.0
Minimum		.00	1.0	.0	2.0	7.0
Maximum		6.00	7.0	10.0	11.0	27.0
Sum		175.00	260.0	268.0	366.0	1069.0

As summarized in Table 2 above, the total mean percentage of misidentification scores computed under each phonemic category reveals that the participants did not have equal level of difficulty in discriminating target sound items. Total error score for the consonants accounted for approximately 51% which is greater than the mean error scores for the three types of vowels: long vowels (48%), short vowels (36.4%) and diphthongs (34.3%). Among the three types of vowels, long vowels received larger error score than that of diphthongs and short vowels. To check whether the observed differences of scores for consonants, short vowels, long vowels and diphthongs were 'real' or 'significant', t-test for all pairs was computed. This t-test was applied in

order to see the existence and nature of differences between scores of the same group to a situation where more than two variables are involved (Diamantopoulos & Schlegelmilch, 2000). The result of the paired sample t-test, as presented in Table 3 below, confirms that there was a significant difference in the participants' perception scores as a function of the phoneme types they heard.

Table 3: Paired samples T-Tests between error scores for vowels and consonants (N=60)

pair	Target pairs	Mean	Std. Deviation	Std. Error Mean	df	t	Sig. (2-tailed
1	short vowel	2.9167	1.42961	.18456	59	-6.238	.000
	long vowel	4.3333	1.33616	.17250			
2	short vowel	2.9167	1.42961	.18456	59	-5.299	.000
	diphthong	4.4667	2.17432	.28070			
3	short vowel	2.9167	1.42961	.18456	59	-13.564	.000
	consonant	6.1000	1.83839	.23733			
4	long vowel	4.3333	1.33616	.17250	59	-.447	.656
	diphthong	4.4667	2.17432	.28070			
5	long vowel	4.3333	1.33616	.17250	59	-6.165	.000
	consonant	6.1000	1.83839	.23733			
6	diphthong	4.4667	2.17432	.28070	59	-5.383	.000
	consonant	6.1000	1.83839	.23733			

Comparisons of the first pair shows that there was a significant difference in the scores for short vowels (M=2.9, SD=1.4) and long vowels (M=4.3, SD= 1.3), t (59) = -.6.238, p< .05. Other pairs that reveal significant differences between scores include short vowel-diphthong, short vowel-consonant, long vowel-consonant, and diphthong consonant. However, the score for long vowels (M=4.3, SD=1.3) and diphthongs (M=4.4, SD=2.1) did not have significant difference, t (59) = -.447, p =.656 > 0.05, and therefore the two vowel types must be considered equal. If the results of the differences hold true, we can explain the extent of perception difficulty caused by the phonemes in this perception test. Accordingly, target consonants with error scores (M=6.1, SD = 1.8) was the most difficult for the participants followed by long vowels and diphthongs with equal score (M= 4.4); while short vowels (M=2.9, SD=1.4) were moderately easier. This result stands consistent with previous research such as Italo (1988) and Moustofa (1979) which

exhibited that not all non-existent English phonemes in the learners' mother tongue exert the same degree of difficulty for the learners.

In order to evaluate performance scores each sound contrast received relative to the other one, additional analyses were carried out separately corresponding to individual target sounds. To begin with the most difficult category, target consonant phonemes are presented first followed by target vowel items in terms of their relative difficulty level.

Inter-dental Fricative Consonants: /θ/ and /ð/

The test presented a total of twelve minimal pair items which contrasted /θ/ with /s/ and /ð/ with /z/ as distinctive features that distinguish one word from the other one. The result of incorrect word identification scores for this particular items (51%) shows that the students most often failed to recognize /θ-s/ and /ð-z/ contrasts as distinctive sounds. Given that the Amharic phonology does not have English interdental fricatives (Taddese, 1966), the Amharic speaking participants faced substantial difficulty to discriminate these sounds (Tables 1 and 2). Why interdental fricatives posed the greatest difficulty for the participants can be explained in relation to the complex nature of these sounds for all learners from virtually all native language backgrounds, including native English children (Gimson, 1980; Jenkins, 2000; Schmidt, 1987).

Table 4 below presents the respective results for voiceless and voiced interdental fricatives. In order to see if the participants performed differently as a function of voicing, paired sample t-test was computed between scores for voiced /ð/ and voiceless /θ/. The result shows that there was no significant difference in scores for the voiced /ð-z/ contrasts (M=3.16, SD=1.22) and voiceless contrasts /θ-s/ (M=2.93, SD=1.32), t (59) = -1.021, p=.311 > .05.

Table 4: Paired samples T-Tests on perception of voiceless and voiced interdentals (N=60)

Target	Mean	SD	Std. Error Mean	df	t	sig. (2-talied
voiceless /θ-s/	2.9333	1.32597	.22844	59	-1.021	.311
voiced /ð-z/	3.1667	1.22359				

The t-test result reveals that mean error scores obtained for voiced /ð/ and voiceless /θ/ should be taken as equal. One of the predictions documented

in the literature based on Eckman's 'Markedness Deferential Hypothesis (MDH)' assumes voiced phonemes as more difficult to learn for second/foreign language learners than voiceless sounds (Eckman, 1977, as cited in Jenkins, 2000). In that sense, the /θ-s/ contrast should relatively be perceived better. However, the performance pattern for the participants of this study suggests that voiced and voiceless interdental fricatives posed equal amount of difficulty for the participants' perception. Lack of such information in the present data may be taken as an indication that both voiced and voiceless interdental fricative consonant sounds unequivocally present acute problems for the participants' perception and thus the participants have found both equally difficult.

The auditory task, containing the two interdental fricatives, also shows a wide range of variation depending on the position of the target sound and the minimal pairs presented. For example, the position of the sounds in the word stimuli seems to function as a cause of variation for the students' perception performance with /ð/ at final positions (60%) receiving greater error score than any other place (44%). Similarly, /θ/ at final positions (52%) was misperceived more often by the participants than they did either at initial and medial positions (43%), (Table 5). From these results, it can be said that the place of the target sounds in the words the participants heard affected the perception performance of the participants with word final positions being the source of most frequent trouble relative to medial and initial positions.

Table 5: Error score distribution per items on /ð/ and /θ/

/ð-/	**%**	**/- ð-/**	**%**	**/- ð/**	**%**	
In *these/zizz*	38.3	In *hazer/heather*	41.6	In *breathe/breeze*	51.6	
In *zed/then*	50	In *teasing/teething*	65	In *close/clothe*	70	
Mean	**44.1**		**53.3**		**60.8**	**52.7**
/ɵ-/		**/- ɵ-/**		**/ -ɵ/**		
In *sing/thing*	45	In *twelfth/twelfths*	21.6	In *faith/face*	40	
In *sought/thought*	56.6	In *force/fourths*	65	In *mouse/mouth*	65	
Mean	**50.3**		**43.3**		**52.3**	**48.3**

The participants' performance also varied as a function of the minimal pairs presented. For instance, misidentification scores on /ð/ varied considerably from 70% to 38.3%. The students heard /ð/ as /z/ more often in items 'close/clothe' and 'teasing/teething' than they did on other items such as 'breathe/breeze', 'hazer/heather', and 'these/zizz'. Similar patterns of variation (from 65% to 40%) across items is also observed in

/θ/ with the students more often failing to correctly identify contrasts such as 'force/fourths' and 'mouse/mouth' than others such as 'faith/face', 'sing/thing' and 'twelfth/twelfths'. Why students performed so differently on these items is not markedly clear. Perhaps, phonetic and phonological environments embedded in the words, or the other vowels and consonants adjacent to the target sounds might have contributed to this variation.

Long Vowels: /i:/, /a:/, /ɔ:/, /u:/ and /ɜ:/

The minimal pair identification task provided a total of nine items contrasting all the five English target long vowels /i:/, /a:/, /ɔ:/, /u:/ and /ɜ:/ with their short counterparts /ɪ/, /ʌ/, /ɒ/, /ʊ/ and /ʌ/. The sixty participants listened to each of the minimal pairs and identified the word with the long vowel which appeared in the stimuli with different arrangements. The total mean score shows that 44.3% of the words the participants chose for the words of the long vowels were words of the short vowels. The following table summarizes the mean percentage of times that target long vowels were incorrectly identified or perceived as short vowels across the items.

Table 6: Error score distribution on target long vowels

/i:/ vs. /ɪ/	**%**	**/a:/ vs. /ʌ/**	**%**	**/ ɔ:/ vs. /ɒ/**	**%**	**/ u:/ vs. /ʊ/**	**%**	**/ɜ:/ vs. /ʌ/**	**%**
In *been/bin*	*30*	-		In *cord/cod*	*63.3*	In *wood/wooed*	*75*	In *bud/bird*	*15*
In *bead/bid*	*40*	In *lard/lad*	*36.6*	In *caught/cot*	*56.6*	In *suit/soot*	*36.6*	In *turn/ton*	*15*
Mean	**35**		**36.6**		**60.0**		**55.8**		**15**
									44.3

The data presented in Table 6 shows a range of variation in mean percentage error scores with /ɔ:-ɒ/ and /u:-ʊ/ contrasts receiving the largest (60%) and (55%) respectively while other contrasts such as /ɜ:- ʌ/, /a:- æ/ are receiving the lowest error score (15%) and (37%) respectively. Just looking at the two extreme results, it is surprising to note that words embedding two novel English vowel contrasts /ɔ:-ɒ/ and /ɜ:- ʌ/ neither of which the learners' native language possesses caused different degree of perceptual difficulty for the participants with the later being relatively easier. This discrepancy, however, can reasonably be explained from the point of view of phonetic properties of the target sounds and the

perceived similarity or difference they might have in English and their relations with the learners' native language.

It must be noted that the Amharic counterpart /o/ vowel is very close in quality and quantity with the English long vowels /ɔ:/ and /ɒ/ with the main difference between the two may be on the position of the tongue and the extent of lip rounding employed. English involves extreme openness and very slight lip rounding to produce these vowels with quantity (i.e. length) being the main distinguishing factor between them (Gimson, 1980); whereas Amharic seems to have slight openness but a considerable lip rounding to produce /o/ (Taddese, 1966). It is understandable that Amharic speakers might perceive English /ɒ/ and /ɔ:/ as the Amharic counterpart /o/ because the native language neither has the short vowel in its quality nor the length to distinguish it from the other one. The effort it required the researcher to perceptually discriminate between these English vowels and their difference with the Amharic counterpart personally witnessed the confusion Amharic speakers might have.

In that sense, the perceived similarity between English /ɔ:/ and /ɒ/ with the Amharic /o/ might have led the Amharic participants to such greater confusions (60%) to identify the words contrasting these vowels than they did with other long-short vowel combinations they heard. The findings just summarized are consistent with the results of most prominent pieces of research on non-native speakers' perceptions (Flege et al., 1997) suggesting that the nature of the native language vowel inventory and its perceived relation to vowels in the second language influence the extent of difficulty to which non-native vowels would be perceived. Similar explanation can be linked to /u:- ʊ/ which received larger error score (56%) than that of /a:-æ/ which was relatively easier (37%) for the participants to distinguish.

The extent that long vowels were misidentified also varied (from 15% to 75%) as a function of the minimal pairs presenting the target vowels. For example, the extreme discrepancy of results for /u:-u/ contrast in minimal pairs 'wood-wooed' (75% error) and 'suit-soot' (37%) seems to have been caused from the nature of the words carrying the target vowels. Similar variation occurred with /i:-ɪ/ and /ɔ:-ɒ/ contrasts as in 'bead/bid' and 'cord/cod' showing greater error scores as opposed to 'been/bin' and 'caught/cot' respectively. It is not evidently clear if such variation occurred due to either familiarity level of the listeners with the words

containing the target vowels or else the particular phonetic and phonological characteristics of the sounds adjacent to the targets. The latter might be viable given that 'bud/bird' and 'turn/ton' which would not in any way represent different level of familiarity for the learners as compared to the other items showed similar pattern as both received the same error score (15%).

Short Vowels: Low vowels / æ, ʌ, ɒ/ and Mid-central vowel /ə/

The minimal pair identification task provided a total of eight items contrasting target vowels with other vowels in five different arrangements: /æ-e/, /æ-ʌ/, /ʌ-ɒ/, /ɒ-ʊ/, /ə-e/. The Amharic speaking participants listened to these vowels embedded in minimal pairs and discriminated one of the words which they perceived corresponding to the word carrying the target English short vowels which are lacking in their native language. The following table summarizes the mean percentage of times that target English vowels were incorrectly identified as represented by the stimuli. In other words, the figures represent the percentage of times that other vowels were heard by the participants instead of the intended target vowels.

Table 7: Error score distribution on target short vowels

/æ/	F	%	/ʌ/	F	%	/ɒ/	F	%	/ə/	F	%
mass/mess	9	15	*flush/flash*	45	75	*dog/dug*	9	15	*ahead/head*	13	22
pack/peck	30	50	*stuck/stock*	15	25	*cod/could*	13	22	-	-	-
fan/fun	41	68									
Total error score (%)		44			50			19			22
mean% (n=8)											36

Being the third most frequently misperceived target phonemes next to consonants and long vowels, short vowels with 36% of error score exhibited variations regarding the extent to which words were misidentified varied across the target vowels embedded. The total misidentification results per each vowel in Table 7 shows that the learners committed higher misidentifications on the back central /ʌ/ and the low front /æ/ vowels (50% and 44%) than they did on the mid central /ə/ and the low back /ɒ/ vowels (22% and 17%). Like what was observed in the results of the long vowels, this result shows that all novel English short vowels did not present equal amount of difficulty to the participants.

The way in which the target English vowels were misidentified varied as a function of the contrasting vowel the participants heard in the minimal pair. For instance, the misidentification scores for target vowels /æ/ and /ʌ/ varied significantly with respect to the particular vowels the participants heard as a contrast. In the case of the mid vowel /ʌ/, the learners misidentified it more often when it was contrasted with low-front vowel /æ/ in 'flush/flash' than they did when it was contrasted with low-back vowel /ɒ/ in 'stuck/stock' (75% vs. 15%). Similarly, the low/open front vowel /æ/ was perceived more poorly when it was contrasted with the mid-back /ʌ/ in 'fan/fun' (68%) than when it was in contrast with mid/half-open front vowel /e/ (M=32%). Yet it also showed some variety again receiving so different error scores in the respective minimal pairs as in 'mass/mess' (15%) better identified than 'pack/peck' (50%); why this occurred is not clear. Perhaps, the particular consonants adjacent to the vowel can be responsible. The case of the other target vowel /ɒ/ seems to be inconsistent to the former pattern to some extent with back-front /ɒ-æ/ contrast in 'dog/dug' receiving (15%) less error score than that of back-back /ɒ-ʊ/ contrast in 'cod/could' (22%).

Similar to the Amharic speaking participants who exhibited different degrees of perception difficulty for the target vowels, previous research (e.g. Brown, 1997) has shown that not all novel segments exert equal amount of difficulty, with some being easy to learn relative to the other. Indeed, this variation is also known to be affected by 'perceived similarity' of novel sounds with that of the native language and other interlingual factors such as amount of exposure, training and experience the learners had (Flege et al., 1997). While which one of these factors or perhaps another is responsible for the participants' variation is not accounted for in this study. It seems reasonable to say that short vowels in general presented considerable difficulty, with front and back vowels /æ/ and /ʌ/ respectively posing greater problems than back vowel /ɒ/. Moreover, the extent that a vowel was perceived showed variation as a function of the contrasting vowel presented in combination with the target vowel. The different degree of difficulty the participants demonstrated in terms of novel English vowels and the accompanying contrasting vowel as well shed light on the importance of training learners with due attention on contrasting vowels that have perceived similarity as /ʌ-æ/ contrasts as in 'luck/lack', and exposing learners to different arrangements as /æ/ with /ʌ/, /eɪ/, /ɒ/, or /aɪ/), as in 'lack' contrasting with 'luck, lake, lock, or like' respectively.

Diphthongs: /eɪ/, /aɪ/, /ɔɪ/, /aʊ/, /əʊ/, /ɪə/, /eə/ and /ʊə/

The participants heard a total of 13 minimal pairs introducing English diphthongs contrasted with other kinds of English vowels such as short vowels (e.g. /eɪ-e/) as in 'mate/met', long vowels (e.g. /aɪ-aː/ as 'pike/park' or other diphthongs (e.g. /aɪ-eɪ/) as in 'pie/pay'. The percentage of times each target diphthong was misidentified is presented as follows in terms of diphthong type, individual diphthong and stimulus (minimal pair) the participants heard.

Table 8: Performance scores per diphthong type

Fronting	**%**	**Centering**	**%**	**Closing**	**%**	**Total**	**%**
/eɪ/, /aɪ/, /ɔɪ/	32	/ɪə/, /eə/, /ʊə/	26	/əʊ/, /aʊ/	55	diphthongs	32

First, from the total 780 words (13 x 60) the participants identified as corresponding to the stimuli they heard containing the target diphthong, 34% of them were rather wrong words containing short vowels, long vowels or different diphthongs other than the target. Among the three types of gliding movement English diphthongs constitute, words with closing diphthongs caused the most misidentifications (55%) for the Amharic participants' perception.

Further analysis was carried out to learn more if particular environments and the accompanying contrasting vowels to the target diphthong compounded the learners' confusion or otherwise. The mean percentage value of misidentification computed in terms of the contrasting vowel for target diphthongs shows greater error score for diphthong-diphthong (37.2%) and diphthong-short vowel (37.4%) contrasts relative to that of diphthong-long vowel contrasts (30.3%). The diphthong-diphthong contrasts include /aɪ-eɪ/ and /eə-ɪə/ from which the former pairs both gliding to front vowel /ɪ/ was more confusing than the latter ones gliding to central vowel /ə/. The next most frequently misperceived diphthong was /eɪ/ which was contrasted with short vowel /e/. It is not difficult to understand the confusing quality of /eɪ-e/ contrasts for Amharic speaking listeners whose native language does not include /eɪ/ and thus who might have heard both as /e/.

The participants were relatively better in distinguishing such diphthongs in diphthong-long vowel context as /ɔɪ-ɔː/ (18%), /ʊə-ɔː/ (30%), /aʊ-ɜː/

(32%), and /ɪə-iː/ (20%). The diphthong-long vowel contrast /əʊ-ɔː/ in the word 'boat-bought', however, exceptionally revealed the most misidentification score (77%) of all diphthongs in all combinations. It is fair to say that this extreme confusion occurred on the minimal pairs constituting by far the most common English words for the participants. Yet the perceived similarity between the vowels and perhaps lack of adequate exposure or familiarity with how the words are pronounced by English speakers might have been responsible.

Table 9: Error score distribution on diphthongs

Target sound	Minimal pair	contrasted with	Error score (%)	Mean
/eɪ/	*mate/met*	/e/	37	38
	sale/sell		38	
/aɪ/	*pie/pay*	/eɪ/	58	39
	pike/park	/aː/	20	
/ɔɪ/	*bore/boy*	/ɔː/	13	18
	coin/corn		22	
/aʊ/	*dirt/doubt*	/ɜː/	32	54
/əʊ/	*boat/bought*	/ɔː/	77	
/ɪa/	*feared/feed*	/iː/	20	20
/ea/	*bear/beer*	/ɪa/	25	27
	stare/steer	/ɪa/	28	
/ʊə/	*poor/paw*	/ɔː/	20	30
	dour/door	/ɔː/	40	

Notes: Target diphthong vs. short vowel (38%); target diphthongs vs. long vowels (31%); diphthong vs. diphthong (37%).

The overall misidentification score in this section reveals the extent that target diphthongs presented to participants to discriminate was heard as a short vowel, a long vowel or another diphthong. Of all target diphthongs presented, diphthongs /aʊ/ and /əʊ/, which were presented to the participants in contrast to long vowels /ɜː/ in 'doubt/dirt' and /ɔː/ in 'boat/bought' respectively, received the largest misidentification score (54.1%) as opposed to the rest of the target diphthongs which all received below 50% error score. On the other hand, diphthongs /ɔɪ/, /ɪə/ and /eə/ received lower error score when compared to /əʊ and aʊ/, /aɪ/, /eɪ/ and /ʊə/ (17.5%, 20% and 26.6% vs. 54.1%, 39.1%, 37.5%, and 30%). Looking more closely the results of each minimal pair item, the /əʊ-ɔː/ in minimal pair 'boat/bought' received significantly the highest error score

as opposed to /ɔɪ- ɔ:/ contrast in minimal pair 'bore/boy' having the least misidentification score (76.6 % vs. 13.3 %).

Conclusion

In this study it was found that target phonemes of English which are lacking in the learners' native language really continue to hinder the participants' listening comprehension. The study has demonstrated that not all novel English segmental phonemes caused equal amount of perception problems for the participants. The data exhibited different degrees of difficulty for the participants depending on whether the sound belongs to consonant, short vowel, long vowel or diphthong. Interdental fricative consonants, for example, represent the first most difficult segmental sound for Amharic speaking learners to perceive with 51% mean error score. With more than 50% of mean error score, most misrecognitions for /ð/ and /θ/ occurred at word final positions where the participants confused them with /z/ and /s/ respectively as in the words such as 'breathe/breeze', 'close/clothe' and 'faith/face', 'mouse/mouth'. Even though the consonants /ð/ and /θ/ at word initial and medial positions were not as troublesome as word final position, there were still more than 46% of the participants who made misidentifications on them. As indicated by Jenkins (2000), Schmidt (1987), and Gimson (1980), these consonants are inherently difficult and the reason for them being difficult for Amharic speakers is not only they are not found in Amharic but also they are the most difficult sound to learn for almost all second language speakers and native children themselves. Extensive training in these sounds with greater awareness of their difficult nature may benefit the learners to improve their pronunciation from perceptual point of view.

With regard to vowels, the first most difficult sounds were long vowels with 48% mean error score. In this study, it was the long vowels /ɔ:/ and /u:/ with 60% and 56% of the participants hearing them as /ɒ/ and /ʊ/ respectively that accounted for the most difficult of all long vowels. Compared to other long vowels included in this study, these vowels were tenaciously difficult. Short vowels accounted for the second most difficult for learners to perceive with 36% of error score. Perhaps, compounded by 'perceived similarity' with the vowels in the native language Amharic such as /a:/, /o/, and /e/, some target vowels such as /ʌ/ and /æ/ turned out to be the most difficult ones with 50% and 44% mean error scores respectively as compared to the other vowels. The target diphthongs which received 34% mean error score also posed considerable

difficulty for the Amharic speaking participants, with /əʊ, aʊ/ (54% mean error score) surfaced in this study as the most misperceived one as compared to the other diphthongs. The particular difficulty the participants had with diphthongs was also explained in relation to 'perceived similarity' the participants might have felt when they heard /əʊ-ɔ:/ contrasts as in words 'boat/bought' which might have caused confusion for the learners. Interestingly, these findings seem to correspond to the most cited study of Flege et al. (1997) in which it was found that English vowels which have 'perceived similarity' with vowels in the native language are most difficult for learners to discriminate. "Both production and perception accuracy varied as a function of native language (L1) background in a way that depend on the perceived relation between English vowels and vowels in the L1 inventory" (p.437).

The learners' perception results therefore show the importance of giving due attention to such perceived similarity between English vowel contrasts in different arrangements during classroom instruction than mere focus on foreign vowels independently so that the learners would benefit in discriminating one from the other. The results of this study confirm what had been hypothesized in interlanguage phonology, that all non-target phonemes do not exert equal amount of difficulty to the learners (Brown, 1997). For priority reasons, long vowels /ɔ:/ and /u:/, diphthongs /əʊ/, and consonants /ð/ and /θ/ fall into the top 5 most misperceived sounds in this study and thus need to be given higher priority in teaching segmental sounds for native Amharic speakers learning English.

Implications

First, the study has verified that learners face serious problems with English pronunciation because many of the features in it are different from what their native language has. It is important that teachers are aware that the learners' native language is an important factor in pronunciation learning and ready to help learners cope with its effect on their learning and use of pronunciation. English language teachers therefore need to be aware of the abilities and the limitations of their learners and devise priorities accordingly. Second, the speech perception test in the study has shown that the learners' pronunciation problem is compounded with the reception side in which the learners face serious problems in recognizing and understanding novel English segmentals pronunciation. Therefore, parallel to the production side, the major

proficiency goals to be aimed at should keep the balance on the receptive skills as well to help learners recognize and make meaning from English pronunciation in spoken communication. It is also important that teachers explain to their students unequivocally the importance of improved pronunciation in their listening as well as speaking for effective communication in the target language. Third, rather than presenting to the learners' novel English phonetic and phonological forms separately, language learners may need to practice certain contrastive patterns that distinguish novel English sounds from their native language counterparts so that learners can clearly perceive and articulate troublesome and confusing words similar to those presented in this study.

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