



Exploring Elision of Schwa of /ə/ in English Utterances by C & U English Majors

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Abstract

An acoustic study on the elision of schwa [jwa:] of /ə/ in English utterances produced by a native speaker of English, a Han Chinese learner of English major, [C] and a Uyghur learner of English majors [U] presented in this paper. With Praat software, three acoustic parameters-fundamental frequencies [F0], the first formant [F1] and the second formant [F2]-are measured with two tiers (syllables and words). The results show that the Uyghur learner of English major produces the elision (omission) of schwa in the same way as the native speaker of English does, while the Han Chinese learner of English major produces schwa of /ə/ in English poorly. The paper indicates that the Elision of Schwa in English produced by learners is influenced by the transfer of their mother tongues. Thus, it enlightens that the second [L2] or third language [L3] speech acquisition is restricted by phonological system of their mother languages, and the contrastive study of the phonological system of the native tongue and the second or third language will give us scaffolding in our phonetic instruction, especially in the teaching of Schwa /ə/ and others in English utterances of Chinese and Uyghur English majors.

Keywords: Elision, Schwa, First formant, Second formant

1. Introduction

It is known that schwa /ə/ is regarded as the essence of English elision. For phoneticians, the most striking characteristic of the vowels is the frequency of first formant (F1) and second formant (F2). The proximate ranges of F1 and F2 of the schwa /ə/ in English produced by native speakers are 400Hz-500Hz, and 1200Hz-1600Hz.

Information about the characteristics of English, Uyghur and Chinese both in sound-changes and pronunciation can be found in previous studies. (Z.Y. Xiao, 1997; Wang, L, 2003; B. Yi, 2006; Pearman, A., 2004) English words of a sense-group appear in the following syllable structures: CVC, VC, CCV, CV (V-vowel, C-consonant). Therefore, the phenomena of liaison between consonants and vowels happen frequently. It is notified that English possesses evident division between stressed syllables and unstressed syllables, which is not only shown in a word but also between words. This means stressed syllables convey key information while unstressed syllables had better be read lightly or missing. So the elision of schwa of /ə/ in connected speech in English is a commonplace.

Schwa is a weak, unstressed sound and it occurs in many words. It is often the sound in grammar words such as articles and prepositions. Getting the schwa sound correct is a good way of making your pronunciation more accurate and natural. The phonemic symbol for this sound is /ə/.

In unstressed syllables, any vowel letter can be pronounced as schwa and the pronunciation of a vowel letter can change depending on whether the syllable in which it occurs is stressed or not. Look at these two words: In the word "man" the letter "a" has its full sound - represented by the symbol /æ/. In "postman" the syllable 'man' is not stressed and the letter "a" is pronounced as schwa, represented by the symbol /ə/.

The sound schwa does not only represent a single letter. In some words it is the sound of several letters or even a whole syllable. This is often, but not only, seen in words which have a syllable made up of a vowel letter followed by the letter "r". Remember the schwa sound is only used if the syllable which it is in is not stressed.

Look at these below examples, the parts *marked italics* are all the schwa sounds:

- (1). This present is *for* my brother.
- (2). It's *a* book *about a* boy wizard.
- (3). To *survive* the cold weather you have to make *thorough* preparations.

Thus, we can safely say that any English vowel letter can be pronounced with the schwa of /ə/, like the following figure shows us as follows,

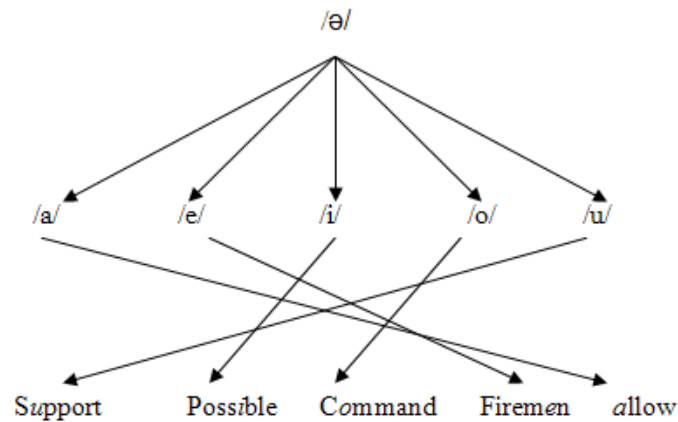


Fig. 1 All possible English vowel letters pronounced the schwa of /ə/

The Qualitative and quantitative researches were done at home and abroad. Some reviewed the usage, the specifications and the general features of the International Phonetic Alphabet (The International Phonetic Association, 1999; Peter Ladefoged, 1976, 1988; Ladefoged, P., 1985; C.K. Gui, 1985; Lin, T., & Wang, L. J, 1992), the speech perception and language experiences, the non-native consonant in perceptual assimilation (Best, C., 1995; Best, C., McRoberts, G., & Goodell, E., 2001; Flege, J. E., Bohn, O. S., & Jang, S., 1997), the acoustic study of English and Spanish vowels (Bradlow, A., 1995; Fox, R. A., Flege, J. E., & Munro, M.J., 1995), the perception of English vowels by Spanish speakers: spectral and temporal effects in the perception of the /i/-/I/ and perceiving vowels, (Escudero, P. R, 2000; 2004; Flege, J. E., & Mackay, I., 2004; Hayes, R., 2002; Morrison, G. S., 2002; Hao-ming, Wang, 2008; Yu-hong, Sun, 2006), the perception of vowel quality (Butler, A., 1976), the experimental Phonetics (K. Hayward, 2000), the Vowel length variation as a function of the voicing of consonant environment (Chen, M, 1970), the Influence of initial and final consonants on vowel duration in CVC syllables (Naeser, M.A, 1970), the Categorization of American English vowels by Japanese speakers. (Fox, M., & Maeda, K, 1999)

Other researchers shifted the insight of phonetics from the physiological interpretation of monosyllabic vowels in Chinese Mandarin (H.Q. Bao, 1984), Chinese phonetics (Wang, L, 2003), Vowel Pattern of Modern Uyghur (B. Yi, 2006), sound change in the learner: The perception of connected speech (Pearman, A., 2004), and even the study of Language and Culture in Xinjiang (Z.Y. Xiao, 1997) and so on.

We find that although research studies of the phonetics are enormous, few studies were carried out in exploring elision of schwa of /ə/ in English utterances by C-U English majors except for Vowel Pattern of Modern Uyghur, phonetics from the physiological interpretation of monosyllabic vowels in Chinese Mandarin, and Chinese phonetics, thus, it is necessary for us to develop this area in order to reinforce the importance of the comparative study of the elision of schwa in C-U English majors to promote the teaching phonetics in China, and the data collected will benefit to all that is going for this area in the world.

2. Distinctive features of Uyghur and Chinese monosyllabic words

In UYGHUR, there are six forms of syllable: V, like [u] (它), CV, like [bu] (这-This)VC, like [at] (马-Horse), CVC, [gyl](花-Flower), VCC, [ast] (下面-under), and CVCC. [pεrq] (地区-region) (Bin, Yi, 2006:141-144) The acoustic fidelity is influenced by near consonants when the moment vowels and consonants are combining. The major traits of modern Uyghur are melodious vowels and weakening of vowels. Apart from that, elision in Uyghur not only happens to consonants but to vowels. So it can be seen that Uyghur share some similar syllable structures with English; what is more, the elision of unstressed vowels exist in both Uyghur and English utterances.

However, there are no multiple consonants in syllable in Chinese, and the Chinese syllables have clear boundary as well as neat structure of CV. Moreover, vowels play a decisive role in expressing meaning in Chinese words. Since monosyllabic word is the basic form of Chinese phonemes, it is impossible that liaison (sound connection) appear between Chinese characters.

The Chinese monosyllabic word doesn't have the separation of stressed syllables and unstressed syllables. Because Chinese monosyllabic word doesn't have to be spelled, and that it can be read directly, but the biosyllabic of Chinese word must be spelled, thus it can be read by the readers. A good example is that monosyllabic word is more fixed than that of Chinese biosyllabic in form and in expressing its meaning, and hence there is a tendency that Chinese words are

developing towards biosyllabic formation. Such as “yī” (壹(one), “èr”(贰) (two) , ”xiě”“血” (blood), in Chinese it is a monosyllabic word which is spelled “xiě”, and 细胞血小板 (xì bāo xiě xiǎo bǎn) (Small plate of cells in blood) is a biolylabic word, thus they consist a certain kind of meaning altogether. The following figures are English phonetic alphabet, Uyghur phonetic alphabet and Mandarin Chinese phonetic alphabet as follows,

Table 1. English Phonetics Alphabet

Vowels	Single Vowels	LV	[a:]	[ə:]	[i:]	[ɔ:]	[u:]				
		SV	[ʌ]	[ə]	[i]	[ɔ]	[u]	[æ]	[e]		
Consonants	Double Vowels	[ai]	[ei]	[ɔi]	[iə]	[eə]	[uə]	[au]	[əu]		
	Voiceless Consonants	[p]	[t]	[k]	[f]	[s]	[ʃ]	[tʃ]	[θ]	[ts]	
	Voiced Consonants	[b]	[d]	[g]	[v]	[z]	[ʒ]	[dʒ]	[dr]	[ð]	[dz]
	Nasal		[m]	[n]	[ŋ]						
	Three similar consonants		[h]	[r]	[l]						
	Semi-vowels		[w]	[j]							

Table 2. Mandarin Chinese Phonetics Alphabet

声母 initials	第一组	b p m f d t n l g k h
	第二组	j q x
	第三组	zh ch sh r z c s
	第四组	y w
韵母 finals	单韵母	a o e i u ü
	a 家族	a - ai ao an ang
	o 家族	o - ou ong
	e 家族	e - ei er en eng
	i 家族	i - ia ie iu in iao ian ing iang iong
	u 家族	u - ua ui uo un uai uan uang
ü 家族	ü - üe ün üan	
整体认读	第一组	zhi chi shi ri zi ci si yi wu
	第二组	yu (ü) ye (ie)
	第三组	yue (üe) yin(in) yun(ün) yuan (üan) ying(ing)

Attention must be paid that Chinese monosyllabic words such as 暗 (à) (dark) , 夜 (yè) (night), 小 (xiǎo) (small), 大, (dà) (big) , 你 (nǐ) (you), 我 (wǒ) (I), 他 (tā) (He/She) , and biosyllabic words such as 天使 (Tiānshǐ) (angel), 魔鬼 (móguǐ) (Evil), 汉语 (hànyǔ) (Chinese), 音节 (yínjiē) (syllable), and 回答 (huidā) (answer) all express its meanings in certain contexts, and all express the smallest unit consciously when speaking, and the extension of our muscle counts how many times we produce the syllable in Chinese. But all the monosyllabic Chinese words can be changed into biosyllabic words like 眼(yán) (eye), 眼睛(yánjīng) (eyes), 学(xué) (learn), 学习 (xuéxí) (learn), 久 (jiǔ) (long), 永久 (yǒngjiǔ) (for ever) and etc.. It is safely to say that such phenomena as assimilation, weakening and elision may not exist in Chinese utterances, but not in Uyghur Language as follows,

Table 3. Uyghur Phonetics Alphabet

独 立 书 体	简 化 独 立 书 体	前 书 体	后 书 体	简 化 后 连 书 体	国 际 音 标	拉 丁 母 音	注 音 (汉 语 近 似 音)
ا	l	ا	ا	ا	a	A	阿
ب	o	ب	ب	ب	b	B	艾博
پ		پ	پ	پ	p	P	坡
ت		ت	ت	ت	t	T	特
ج		ج	ج	ج	dʒ	J	基
چ		چ	چ	چ	tʃ	Q	期
خ		خ	خ	خ	x	H	黑
د		د	د	د	d	D	的
ر		ر	ر	ر	r	R	尔△
ز		ز	ز	ز	z	Z	孜
س		س	س	س	s	S	孜
ش		ش	ش	ش	ʃ	X	斯
ھ		ھ	ھ	ھ	h	H	西
ق		ق	ق	ق	q	Q	合
ك		ك	ك	ك	k	K	佛
گ		گ	گ	گ	g	G	渴
ن		ن	ن	ن	ŋ	NG	克
ل		ل	ل	ل	l	L	格
م		م	م	م	m	M	厄
ھ		ھ	ھ	ھ	h	H	勒
و		و	و	و	w	W	莫
ۇ		ۇ	ۇ	ۇ	u	U	内
ۈ		ۈ	ۈ	ۈ	ü	Ü	核
ي		ي	ي	ي	y	Y	窝
ۋ		ۋ	ۋ	ۋ	w	W	乌
ە		ە	ە	ە	e	E	月
ى		ى	ى	ى	i	I	于
ې		ې	ې	ې	j	J	维
ۋ		ۋ	ۋ	ۋ	w	W	也
ۋ		ۋ	ۋ	ۋ	w	W	依
ۋ		ۋ	ۋ	ۋ	w	W	宜

Form the above figures, we find that although they are three different internal languages, they have similar pronunciations and more or less similar spellings.

Hence, we can make assumptions that (1) the Uyghur learners of English produce the elision of schwa /ə/ in English major utterances in the same way as the native speakers of English do; by contrast, (2) the Han Chinese learners of English major produce English schwa /ə/ obviously in connected speech without elision.

The implications for this are that when the Uyghur and Chinese English majors are taught phonetics of English language, the teacher should pay much attention to the manner of speech and place of tongue in pronouncing English Schwa /ə/ and the liaison spelled by Uyghur and Chinese English majors to overcome the difficulties they meet in their English study, and thus fulfill successful communication among them in their daily life. In that case, the positive transfer of the mother tongue is overcome in their English learning.

2. Experimental Design

2.1 Sampling Subjects

One female speaker of English, one female Han Chinese speaker, and one female Uyghur speaker served as the three subjects. The native speaker of English from the United States aged 40 and was working as an English teacher at the college with the first researcher at the time when the experiment was carried out. The two local learners of English, one being Han Chinese speaker and one being Uyghur speaker, were students of English majors at the same college with the first researcher, and both of the two local learners of English in China were 22 years old. They were treated as intermediate-level learners of English majors.

2.2 Stimuli experiment

The stimuli experiments consist of two sentences and one phrase with three types of elision of the schwa /ə/: (1) elision in liaison, (2) elision in quick speech and (3) elision influenced by weak form.

Elision is the omission of a sound or sounds, either within the body of a word or at a junction of words. There are two different kinds of elisions; they are historical and contextual elisions.

(1). Historical elisions are sounds which exist in an earlier form of a word are omitted in a later form. These kinds of elisions of unstressed vowels, especially /ə/ and /i/, are very common in English. Such as *history* /'hɪstəri/→/'hɪstri/, *every* /'evəri/→/'evri/, *university* /ju: ni 'vɜ:sɪti/→/'ju: ni 'vɜ:sti/, *family* /'fæmili/→/'fæmli/, and *easily* /'i: zili/→/'i: zli/.

(2). Contextual elisions are sounds which exist in a word said by itself are omitted in a compound or in a connected phrase utterance. In rapid speaking, (elision in quick speech) a group of consonants may be dropped out, especially /t/ and /d/ such as *just now* /'dʒʌst 'nau/ or /'dʒʌs 'nau/, *I want to* /ai 'wɔ nt tu/ or /ai 'wɔ n tu/, *blind man* /'blaɪnd 'mæn/ or /'blaɪn 'mæn/, and *stand guard* /'stænd 'ga:d/or/'stænd 'ga:d/.

Liaison, (sound connection) in English, is that one word is not separated from another by pausing or hesitating; the end of one word flows straight on to the beginning of the next. Such as *first of all* /'fɜ: stəvɔ 'ɔ: l/ and *some of us* /'sʌm əv əs/. The linking of words in connected speech may be divided into the following four types:

(1) When the final sound of the word before is a consonant, you must link the final consonant to the initial vowel sound of the next word. It will help if you treat the final consonant as if it were transferred to the next words. Such as *put it on* /'putɪ'tɒn/; *look at it* /'lʊkətɪt/; *think of it* /'θɪŋkəvɪt /.

(2) When the final sound of the word before is a vowel you must link the vowel sound to the initial vowel sound of the next word. Here a short and gentle /j/ or /w/ is used.

a) After /i:/, /i/ and the diphthongs /ei, ai, ɔi/, which end in /i/, we can use a very gentle /j/ as the link. Such as *the other* /ði-ɔj-ʌðə/; *he is my uncle* /hi: ɔj-ɪz maɪ-j-ʌŋkl/; *she ate some* /ʃi: ɔj-ət səm/. However, we do distinguish between “my ears” and “my years”, etc. “years”/jɪəz/ has a longer and stronger /j/ than the shorter and gentle link /j/ before “ears”.

b) After /u:/, /u/ and the diphthongs /əu, au/, which end in /u/, we can use a gentle /w/ as the link. Such as *two others* /tu: əw-ʌðəz/; *do it* /'du: əw-ɪt/; *how old* /'hau-w-əʊld/. Again we distinguish between “two-eyed” and “too wide” /tu: əw-əɪd/ and /tu: 'waɪd/.

(3) When a word ending with “r” or “re” goes before a word beginning with a vowel sound /r/ is usually pronounced as a link. Such as *for ages* /fə' eɪdʒɪz/; *her own* /hə: r əʊn/; *share out* /ʃə r 'aʊt/; *far away* /fɑ: rə 'wei/

However, there are special circumstances in which a final “r” is silent even when the following word begins with a vowel.

a) When there is a /r/ in the same syllable, such as *a roar of laughter* /ə 'r ɔ: əv 'la: ftə/; *a rare animal* /ə 'rɛə 'æniml/; *nearer and nearer* /'niərə ən 'niərə/.

b) When a pause is permissible between the two words (even if no pause is actually made) such as *He opened the door and walked in* /hi: 'əʊpnd ðə 'd ɔ: ənd 'w ɔ: kt in/.

(4) some English people link a final /ə/ or even /a:/ and /ɔ:/ to an initial vowel in the same group by inserting a /r/ sound even if there is no letter r in the spelling. The /r/ sound added in this way is called “intrusive r”. Its existence

should be known but not imitated. Such as *China and Japan* /'tʃaɪnə ən(d) dʒə'pæn /; *drama and music* /'dra:mə ən(d) 'mju:zɪk/; *law and order* /'lɔ: r ən (d) 'ɔ:də / and *I saw a man* / ai 'sɔ: r ə 'mæn /.

2.2.1 Stimuli experiment one by the first sentence

The first sentence “Please get another one” is first read by one native speaker of English, and then by the Uyghur and Han student of English majors separately. They have 5 minutes to prepare for the perception of the experimental materials. In the sentence “Please get another one”, the word “another” pronounced as [ə' nʌðə] has their screening characteristic in its pronunciation with “get”, thus the elision in liaison of Schwa /ə/ in English utterances appeared when the subject perceive this phonetics.

2.2.2 Stimuli experiment two by the second sentence

The second sentence “Tell me about it” is a typical elision in quick speech between the two words of “me” and “about” that the elision in liaison often happens when they meet together, thus /ə/ in “about” is the representative of schwa of /ə/ in elision in quick speech. The sentence like this often exists in English sentences. When the experimental stimuli starts, the subjects are not told to read which kind of sentence they are going to read to avoid experimental interference.

2.2.3 Stimuli experiment three by the phrasal utterance

The phrasal utterance of “My favorite fruit” is also manipulated which is very different from the former two sentences because we assumed that the subjects must weaken the elision schwa / ə /, thus to prove the significant differences among the three subjects coming from different language experiences. The researcher should focus on /ə/ in [ˈfeɪvərɪt] produced by the word “favorite” when the subjects pronounce the phrasal utterance.

2.3 Experimental procedures and acoustic measurements in the experimental study

Every speaker was presented with the sheet with the sentences and phrase on it, and asked to produce each one naturally. Recordings were handled with a computer in a quiet classroom. After that, all the experimental materials were analyzed at the aid of Praat speech analyzing software [PRAAT 4.0] in order to get the similarities and differences of the elision of schwa of /ə/ and the data of F0, F1 and F2.among three different subjects.

The recordings were analyzed using the Praat speech analyzing software (<http://www.praat.org>). The traditional conclusions by auditory studies for elision of the schwa /ə/ were referenced by the present experiment. F0 (the fundamental frequency), F1 (the first format) and F2 (the second format) were measured to mark the existence of /ə/ in the uttered English sentences and phrase by the three subjects, that is the native speaker of English, the Han Chinese students [C] and Uyghur English majors. [U]

3. Data collection, Analysis and Results of the experimental study

Data collection, analysis and results includes phonological analysis produced by the first sentence of “Please get another one”, the second sentence of “Tell me about it” , and the phrasal utterance of “My favorite fruit”, produced by the native speaker of English , the Uyghur student and the Han student respectively. We pay much attention to whether the three different subjects omitted the schwa of /ə/ influenced by her own mother language, and thus to justify our hypotheses mentioned in the distinctive features of Uyghur and Chinese monosyllabic words.

3.1 Data collection and analysis produced by the first sentence

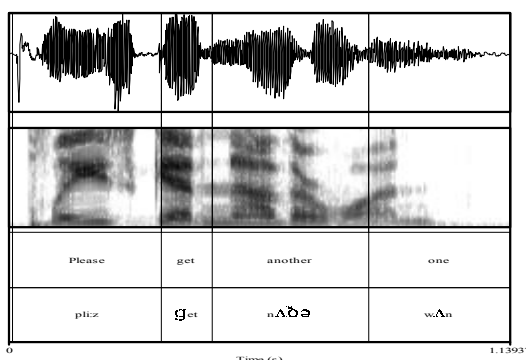


Fig. 2. The first sentence produced by the native speaker of English

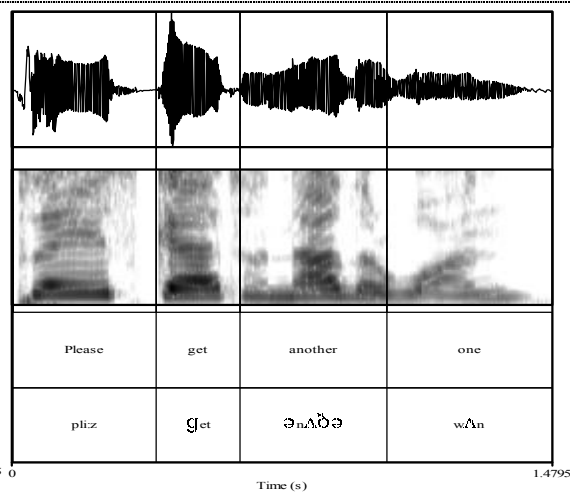
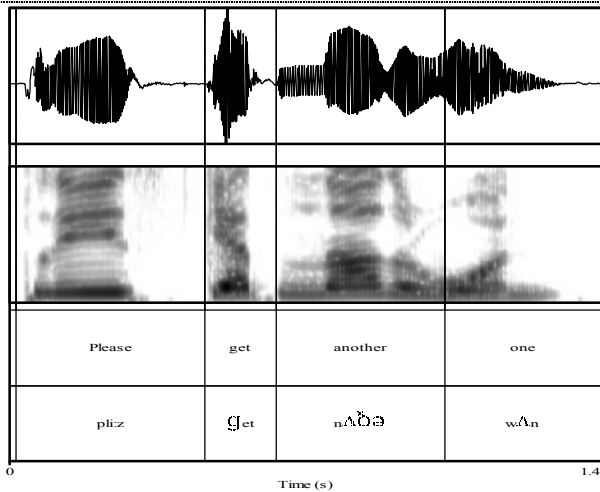


Fig. 3. The first sentence produced by the Uyghur student Fig. 4. The first sentence produced by the Han student

In Figures 2 and 3, the spectrograms the sentence “*Please get another one*” produced by native speaker of English and the Uyghur student show that the schwa /ə/ between consonant /t/ and nasal /n/ is missing. The schwa /ə/ is reduced both by the native speaker of English and the Uyghur student under the condition of liaison. However, Figure 4 shows that there is a mid-central /ə/ in the front of the word “another” /ə'nʌðə/ produced by the Han student of English major, (F0=273Hz, F1=336Hz, F2=1632Hz) which is very different from those of the native speaker of English /'nʌðə/ and the Uyghur learner of English major /'nʌðə/, thus we say that it is possible that the Han student of English major, influenced by her mother language-mandarin Chinese, performed stronger in pronouncing one of the three types of elision of the schwa /ə/ executing by elision in liaison on the grounds that the Chinese monosyllabic word doesn't have the separation of stressed syllables and unstressed syllables and Chinese monosyllabic word doesn't have to be spelled, and that it can be read directly.

3.2 Data collection and analysis produced by the second sentence

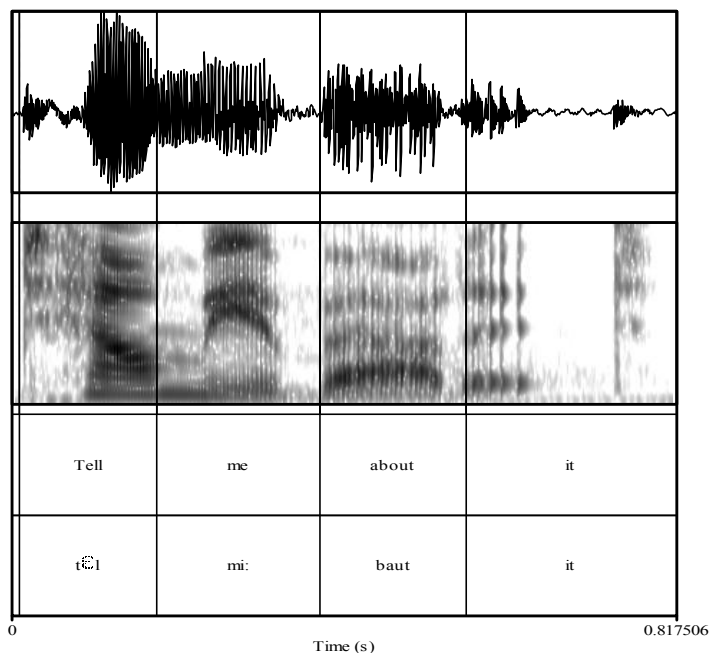


Fig.5. The second sentence produced by the native speaker of English

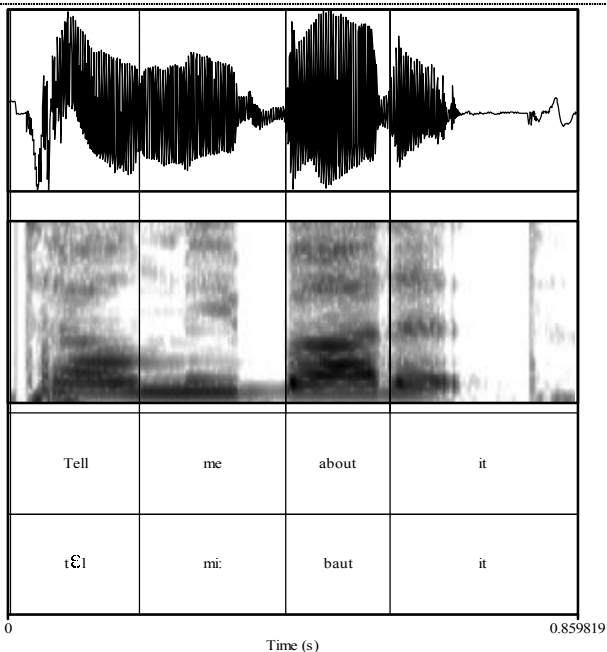


Fig. 6. The second sentence produced by the Uyghur student

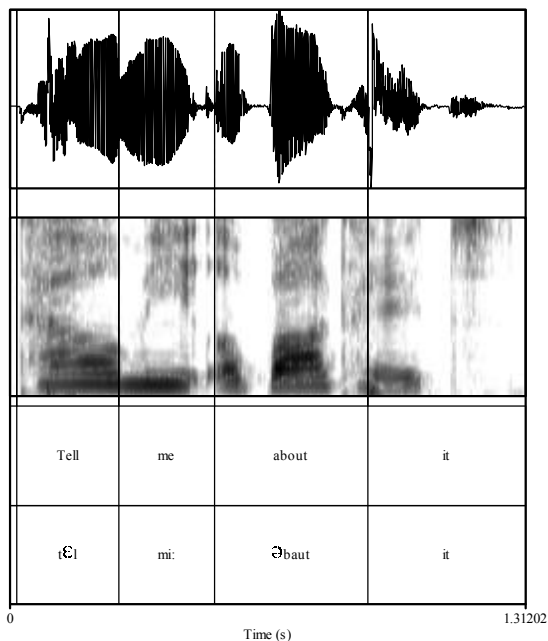


Fig. 7. The second sentence produced by the Han student

The spectrograms of Figures 5 and 6 shows that the schwa /ə/ of the word “about” in “Tell me about it” produced by native speaker of English and the Uyghur student of English major is missing, spelled /'baut/ in the sentences produced by both the native speakers of English and the Uyghur student. However, Figure 7 shows that the schwa /ə/ in “about” is pronounced /ə'baut/ without saving effort elision schwa /ə/ in quick speech by the Han student of English major as it is certainly influenced by the Chinese phonology. (F0=246Hz, F1 =677Hz, F2=1290Hz) Therefore, we say that although the sentence of “Tell me about it” aims to tap the subjects’ elision of schwa / ə / in quick speech, we Chinese teachers of English should pay much attention of this phenomenon.

3.3 Data collection and analysis produced by the phrasal utterances

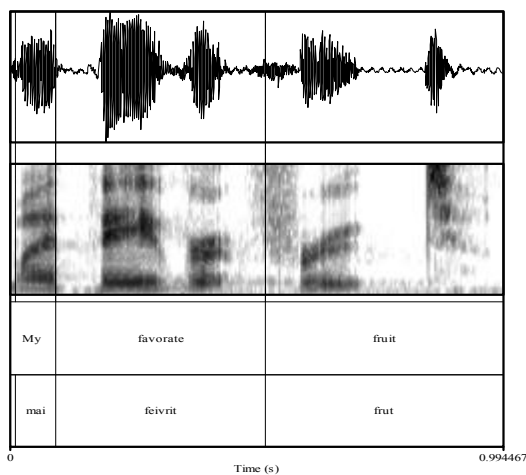


Fig. 8. The phrase produced by the native speaker of English

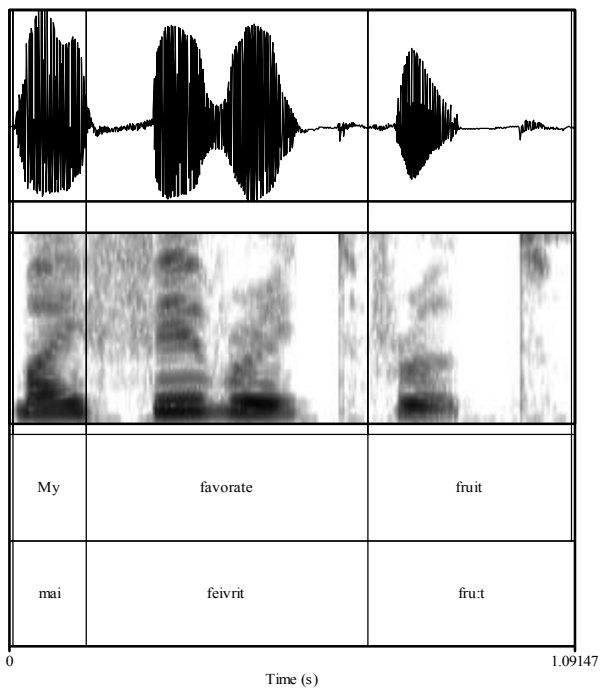


Fig. 9. The phrase produced by the Uyghur student

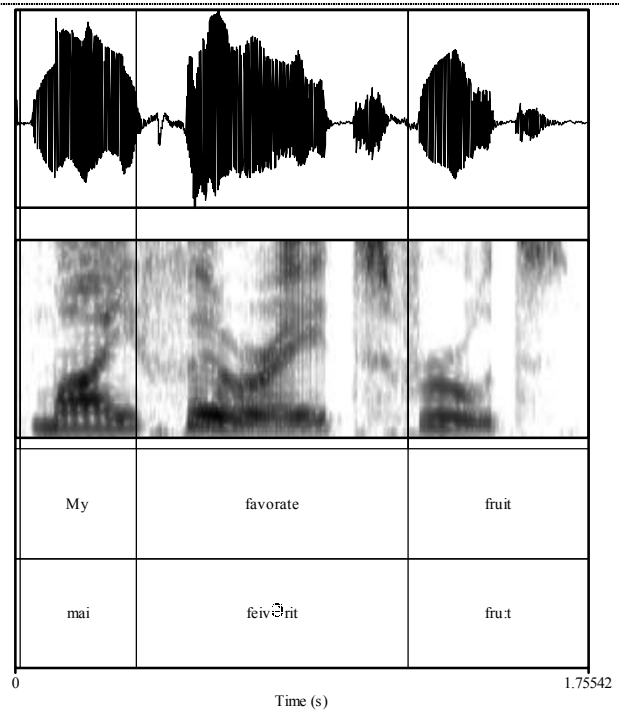


Fig. 10. The phrase produced by the Han student

Figures 8, 9 and 10 show that the vowel /ə/ in the word “*favorite*” is omitted by both the native speaker of English and the Uyghur student of English major, but the Han student of English major produces the phrase without losing any sound, (F0=191Hz, F1=558Hz, F2=1385Hz) which can be explained by the influence of the Chinese syllable structure. Since in Chinese syllable structure, the vowels including /ə/, which are the centers of syllables, play an important role, the Chinese students stress such phonemes in Chinese so as to present the meaning which the syllable stands for.

4. Conclusion and limitations

From the three stimuli experiments above, it can be concluded that the way that the schwa /ə/ produced by the Han Chinese learner of English major is obviously different from that of both the native speakers of English and the Uyghur learners of English major. The Han Chinese learner of English major produces English utterances *syllable by syllable* without the elision of schwa /ə/. The Uyghur learners of English major produce the elision of schwa /ə/ in the same way as the native speaker of English does.

The differences are due to the interference of their respective first language phonology. As to the elision of schwa /ə/, the Uyghur learners of English major are positively influenced by the transfer of their mother tongue, while the Han Chinese learner of English major are negatively influenced by the transfer of her mother tongue.

The present study only touched upon the elision of schwa of /ə/ in the central vowels, the other two central vowels in English, that is /ʌ/ and /ə:/ didn't explore in our present study, among which /ʌ/ is a short, half-open, unrounded central vowel. It is a lax one; (such as /ʌ/ u: *sun hungry*; o: *son, another*; ou: *enough, couple, double, young*) /ə:/ is a long, half-close and half-open, unrounded, tense central vowel. (such as /ə:/er: *term, certainly*; ir: *first, third*; ur: *turn, Thursday*; or: *work, word*; ear: *learn, early*)

It is hoped that the results will have implications for English teaching and learning in Xinjiang, even in China. However, we have long way to go because we may meet with lots of difficulties and problems. But if we take measures in the teaching of English phonetics, especially in comparing and contrasting the similarities and differences between the mother languages and the target language, and attention must be paid when the Han students of English major pronounce the elision of schwa of /ə/, they can produce good English pronunciation of vowel in their study, and getting the schwa sound correct is a good way of making your pronunciation more accurate and natural.

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