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Pronunciation of English Consonants, Vowels and Diphthongs of Mandarin-Chinese Speakers

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Abstract
This paper aims to analyze the production of English consonants, vowels and diphthongs of Mandarin-Chinese speakers and find out problems existing in their English pronunciation. Based on the analysis of 50 participants recordings, it is concluded that the subjects have difficulty in pronouncing the dental fricatives /ð/ and /θ/ and the regular plural forms. In terms of vowels and diphthongs, major problems appear in confusion between /iː/, /ɪ/ and /eɪː/. The substitution of /s/ for /θ/ is typical for Mandarin speakers from Northern part of China. The findings may provide guidance for English teachers and learners when teaching or learning English pronunciation. Special attention should be paid to the problematic consonants, vowels and diphthongs.

Key words: Mandarin-Chinese speakers; Pronunciation; Consonants; Vowels; Diphthongs

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INTRODUCION
English learners whose first languages are Asian language tend to show phonetic inaccuracies in their learning of English as second or foreign language (Flege, 1989; Flege & Davidian, 1985; Pittam & Ingram, 1992; Tarone, 1980; Wang, 1983; Yang, 1996, as cited in Yang 2001). From my own English learning and teaching experience, Mandarin speakers have distinctive features in the production of English sounds.

The study focuses on the segmental phonemes of English speech sounds, namely, consonants and vowels. Non-native speakers from different first language groups find various problems when learning English speech sounds. For Mandarin speakers, there are a few English consonants and vowels or diphthongs that are difficult for them to pronounce. For instance, many of them use substitutions /s/ and /z/ for interdental fricatives /θ/ and /ð/, which do not exist in Chinese language. So they have great difficulty in pronouncing /θ/ and /ð/. There are no plural forms in Chinese language, so the pronunciation of /s/, /z/, /ɪz/ causes problems for Chinese speakers. In terms of vowels, some Chinese learners are unable to discriminate vowel contrasts. Diphthongs are frequently found mispronounced as well. In the process of learning a second or foreign language, the transfer of L1 phonological features has a great influence on L2 acquisition (Lado, 1964). Chinese pronunciation has an impact on learners' production of English sounds. So certain pronunciation features of Chinese speakers are closely related Chinese language. Their pronunciation features usually follow systematic patterns rather than randomly happen. The study aims to diagnose the problems in the Chinese Mandarin speakers' pronunciation in term of consonants, vowels and provide guidance for English teachers.

1. LITERATURE REVIEW
Menyuk (1968) and Schmidt (1977) claims that dental fricatives /θ/ and /ð/ are the last sounds that native speakers grasp in their language development and most frequently found to be substituted by other sounds. This probably explains why non-native speakers find problems in pronouncing the two sounds. One of the common difficulties for Mandarin speakers in learning English

pronunciation is the sounds absent in Mandarin Chinese language (Chang, 2000), for instance, interdental fricative /θ/ and /ð/. Lu (2008) proposes that different languages choose /t, d/, /s, z/ or /f, v/ as substitutes for dental fricatives /θ/ and /ð/. The English noun plural forms which are very different from the formation of Chinese plural forms also create difficulties for Mandarin speakers morphologically (Liu et al., 2006). But little research has been conducted into the impact the phonological feature of English noun plural form may have on Chinese learners. Apart from consonants, a great deal of research has been carried out to explore the mispronunciation of vowels in Chinese learners' speech. Chang (2000) conducted an experiment in the pronunciation of English diphthong /eɪ/ by Chinese learners and the effect of the immediate phonetic contexts may have on the accuracy of the pronunciation of /eɪ/. She concludes that general Chinese learners have problems in pronouncing diphthong /eɪ/ and post-vocalic consonants constitute the primary source of difficulty of Chinese learners. The subjects in the study have problems related to /eɪ/, but it is not identical with Chang's discovery. Researchers performed an acoustic study on the production of American English vowels by Mandarin speakers and indicate that the vowel production of Mandarin speakers is less acoustically diversified compared to Native American speakers' production (Yang et al., 2001). Besides, it is found that Mandarin speakers' production of vowels which have counterparts in Chinese is more intelligible than those which do not have obvious counterparts when researchers conducted an experiment involving the following vowels, /i/, /eɪ/, /ɛ/, /æ/, /u/, /ʊ/, /oʊ/, /ɒ/, /ʌ/ (Wang, 1997). Another group of researchers discover that Mandarin phonetic and phonological system has a significant impact on the production of individual vowels and vowel contrasts (Jia et al., 2006). The paper aims to find out the pattern the subjects produce dental fricatives /θ/ and /ð/ when 'th' is in the onset position and explore the features of the pronunciation of the suffixes of noun plus forms as well as the production of vowels and diphthongs.

2. METHODOLOGY

2.1 Subject

The 50 participants in this study were randomly chosen from non-English major undergraduate students in Shanxi Normal University. They started learning English from junior middle school and their current English proficiency is College English Test-Grade 4, which is a basic requirement for university students in Mainland China. They do not have overseas learning experience. Their learning of English primarily happened in classroom and they have little exposure to English in everyday life except seeing English movies.

2.2 Test Material

The chosen passage is a general diagnostic text which covers the full inventory of speech sounds of British English.

> If you're going shopping, John, could you get me these few things, please? Three kilos of green beans, six tins of mixed pickles, ten red or yellow peppers, a bag of apples, half a carton of large tomatoes, a pot of hot coffee, four sorts of corn, a cookery book, a bunch of bananas and some butter, two tubes of that useful new glue, some first early potatoes, eight paper plates, a whole Dover sole, five kinds of white wine, a pound of brown flour, some olive oil and cooking foil, some beer, not too dear, some pears to share, some ham to cure, if you're sure it's pure, and a chunk of Dutch cheese, cut thick or thin. Thanks very much, John. (From an English course material)

As my aim is to measure the subjects' pronunciation of consonants, more specifically the sounds /θ/ and /ð/ as well as the regular plural suffixes, and the vowels and diphthong, the passage contains many words with 'th' and plural form nouns along with contrasting vowels and diphthongs in each line. The material mainly consists of phrases and short sentences instead of isolated words to elicit the subjects' natural pronunciation without feeling being tested. The vocabulary in the passage is frequently used in daily life to make sure the subjects read the passage easily and naturally.

2.3 Data Collection Procedure

The subjects were provided 10 minutes to familiarize and practice the passage with the help of a dictionary to help them look up the unfamiliar words. Then the subjects were asked to read the material aloud and clearly at a normal speed with brief pauses between lines. Their readings were recorded by a high-quality DV in a quiet environment.

2.4 Data Analysis

The data were listened to a great number of times to identify particular features and systematic patterns of their pronunciation. Then the recordings were transcribed as the two columns, target pronunciation and learner's pronunciation to form a comparison. Through comparison, repeated mispronunciations are highlighted to see if they follow some pattern. If they are, they will be analyzed in great detail.

3. DISCUSSIONS AND FINDINGS

3.1 Consonants

After the transcription and comparison, two specific features emerged from the recording with regards to consonants. Two tables are formed to make the features more accessible. Table 1 illustrates the pattern of the subjects' pronunciation of 'th' at the initial place of a word. Table 2 describes the feature of the subjects' pronunciation of plural suffix 's' at the end of each noun.

Table 1
Pronunciation of 'th' at the Initial Position of a Word

Words	Target pronunciation	Learner's actual pronunciation
these	/ðiːz/	/zeɪz/
things	/θɪŋz/	/sɪŋs/
three	/θriː/	/sreɪ/
thick	/θɪk/	/sɪk/
thin	/θɪn/	/sɪn/
thanks	/θæŋks/	/sæŋks/

It can be seen from Table 1 that the subjects have difficulty in pronouncing the dental fricatives /ð/ and /θ/. All of the 6 words except the first one 'these' start with the voiceless dental fricative /θ/, the subjects produced it as voiceless alveolar fricative /s/. Mandarin speakers tend to replace /θ/ by /s/ as a substitution because /θ/ does not occur in Chinese. The phenomenon has been identified by researchers, for example Weinberger (1990, cited in Lu 2008), he argues that learners from various first languages may choose the same substitution and Mandarin, Japanese, French, German and so on all substitute /s/ for /θ/. All the 5 words beginning with /θ/ were produced as /s/ and to some extent it is possible that the subjects are unable to produce the target pronunciation.

Table 2
Pronunciation of Regular Plural Suffixes

Words	Target pronunciation	Learner's actual pronunciation
things	/θɪŋz/	/θɪŋs/
kilos	/ˈkɪləʊz/	/ˈkɪləʊs/
beans	/biːnz/	/biːns/
tins	/tɪnz/	/tɪns/
pickles	/pɪklz/	/pɪkjʊs/
peppers	/ˈpepəz/	/ˈpepəs/
apples	/ˈæplz/	/ˈæpls/
tomatoes	/təˈmaːtəʊz/	/təˈmaːtəʊs/
bananas	/bəˈnɑːnəz/	/bəˈnɑːnəs/
tubes	/tjuːbz/	/tjuːbs/
pears	/peəz/	/pɪəs/
potatoes	/pəˈteɪtəʊz/	/pəˈteɪtəʊs/
kinds	/kaɪndz/	/kaɪndz/
sorts	/sɔːts/	/sɔːts/
plates	/pleɪts/	/pleɪts/

The voiced dental fricative /ð/ was pronounced as /z/ by the subjects. Since there is only one such word in the material, it is unreasonable to argue that the subjects are unable to produce the target pronunciation. There is some possibility that they made a careless mistake. But we can see from the transcription that they produced the vowel /eɪ/ instead of /iː/ in the word 'these'. The sound /iː/ is an unrounded front vowel with the lips spread and it is often diphthongized (Cruttenden, 2001). So the speakers replaced /iː/ by /eɪ/ with mouth more open, and this immediate phonetic context causes the change of /ð/ to /z/.

Table 2 shows that the phonological feature of the plural form poses difficulty for the subjects. They pronounced the suffixes of English noun plural form's' as /s/ in most of the time. The regular plural suffixes follow three rules (Avery & Ehrlich, 2002; Deterding & Poedjosoedarmo, 1998). The first rule defines if the final phoneme of the base form is one of the sounds /s, z, ʃ,ʒ, tʃ, dʒ/, the '-s' suffix is pronounced /ɪz/ or /əz/; The second rule says that if the final phoneme of the base form is not one of the sibilants and it is voiced (all vowels are voiced), the '-s' suffix is pronounced /z/; The third rule is that if the final phoneme of the base form is not a sibilant and it is voiceless, the '-s' suffix is pronounced /s/. The first 12 words in Table 2 all belong to the second category, but the subjects produced all the suffixes as /s/. It seems that their knowledge of the pronunciation of the regular plural suffix is that adding '-s' means pronouncing /s/. Apart from the plural nouns, they also produced 'please' /pliːz/ as /plːs/ in the recording. So it is possible that their replacement of /s/ with /z/ is high in their speech, especially when the sound /s/ appear at the coda position of word. However, the last three words in the table 'kinds, sorts, plates' were all produced right by the subjects. The three words share something in common. They all end up with the alveolar stop /t/ and /d/. Possibly, the subjects can pronounce the suffix '-s' right, when the final sound is /t/ or /d/.

3.2 Vowels

Table 3
Vowel Feature in the Subject Pronunciation

Words	Target pronunciation of the vowel in each word	Subject's pronunciation of the vowel in each word
three	/iː/	/eɪ/
these	/iː/	/eɪ/
kilos	/ɪ/	/eɪ/
early	/ɪ/	/eɪ/
ten	/e/	/ə/
few	/uː/	/iː/
you	Strong form /uː/ weak form /u/ or /ə/	/əʊ/
pound	/aʊ/	/ɒ/
brown	/aʊ/	/ɒ/
pear	/eə/	/ɪə/
share	/eə/	/ɪə/

Unlike consonants of Table 1 and Table 2, it is hard to find a particular pattern of a sound from Table 3, but we can find that there some vowels and diphthongs that may

easily be mispronounced by the subjects, for instance, /iː/ is replaced by /eɪ/. The subjects seldom mispronounce a few sounds, such as /ɑː/, /ʌ/, /ɒ/, /aɪ/ and so on.

The results of the most mispronounced vowels and diphthongs are summarized as follows: First, among the mispronounced vowels and diphthongs, they produced /aʊ/ and /eə/ as /ɒ/ and /ɪə/ two times in all. That is the total number of the two diphthongs appearing in the reading passage. In general, they have greater difficulty in pronouncing diphthongs compared to monophthongs. Second, there is an interesting finding that a higher rate of mispronunciation of /iː/ and /ɪ/ as /eɪ/ appear in their recordings. This phenomenon may arise from the fact that their Chinese dialect has a strong accent of /eɪ/, so the counterpart in Chinese negatively affect their acquisition of the diphthong. Third, In terms of /uː/, they produced it as /iː/ in the word 'few' and /əʊ/ in the word 'you'. /e/ and /æ/ are difficult for Mandarin speakers to distinguish, for example, 'bag' and 'red' in the passage. But the subjects did not make mistakes concerning the comparison of the two sounds. Instead, they pronounced /ten/ as /tən/. In a whole, the subjects show fewer problems in the pronunciation of vowels and diphthongs.

CONCLUSION

From the above findings, it is concluded that the subjects have greater difficulty in the production of dental fricative and regular plural forms. They produced voiceless dental fricative /θ/ as /s/ when /θ/ occurs at the initial position of a word. Not enough evidence has been found about their tendency in the production of /ð/ in the word-initial position. Their biggest problem occurs in the pronunciation of regular plural suffixes. They applied the third rule to most plural forms and produced as /s/. In terms of vowels and diphthongs, major problems appear in confusion between /iː/, /ɪ/ and /eɪː/ and /aʊ/, /eə/ is also found difficult for them. The substitution of /s/ for /θ/ is typical for Mandarin speakers from Northern part of China. Though the feature regarding vowels and diphthongs are not so systematic and do not follow particular pattern like consonants, the findings show their problems in the production of /iː/, /ɪ/, /e/, /uː/, /aʊ/ and /eə/.

For English teachers, when teaching pronunciations, special attention should be paid to the above consonants, vowels and diphthongs. At the same time, students should raise their awareness about English sounds and try their best the improve their English pronunciation in order to speak English naturally and fluently.

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