

# ***A Contrastive Study of English and Mandarin Vowel Systems and Its Implications for TESOL***

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**Abstract:** In recent decades, due to the prevailing contrastive analysis, substantial detailed research has been done on the comparison of English and Mandarin vowel systems. Nonetheless, few researchers have ventured into the analysis of its implications for teaching English to speakers of other languages (TESOL). This paper functions to illuminate the particular challenges that the differences between the two systems are likely to present to Mandarin English learners of English, and to propose feasible solutions for educators and second-language learners to overcome these challenges. Through a thorough contrastive analysis of English and Mandarin vowel systems, this paper draws the conclusion that both the similarities and differences can be enormous hindrances for Chinese English learners. The paper also proposes corresponding solutions for TESOL, including attaching importance to the contrast of English and Mandarin vowel systems in classes and utilizing various educational technologies. Having been aware of the countermeasures, students will understand how to pronounce English vowels accurately and authentically, and the teacher will have a more precise map in TESOL.

**Keywords:** English, Mandarin, vowel system, TESOL

## **1. Introduction**

English and Chinese have respectively ranked the first and third foreign languages learned by international students. Consequently, the education and acquisition of both English and Chinese have been enormously significant. Nevertheless, compared with writing and reading, speaking is not attached to much importance by language educators, immensely impeding students' acquisition of decent utterances. Besides, according to the language transfer (LT) theory, Mandarin learners' acquisition of English is inevitably influenced by their mother tongue [1]. For instance, in English phonetic teaching, the acquisition of English vowels is a prodigious hardship for Chinese students because of the differences between English and Mandarin vowel systems.

Accordingly, this paper intends to compare English and Mandarin vowel systems of English and Mandarin, and to analyze its implications for teaching English to speakers of other languages (TESOL). The first part of the paper introduces the two languages' vowel systems, including monophthongs and diphthongs before making a comparison. The second part analyzes the challenges that the differences between the two systems are likely to present to Mandarin learners of English. The last part is to propose corresponding countermeasures for educators and second-language learners to overcome these challenges.

The purpose of the paper is to find out the similarities and differences in the vowel systems of English and Mandarin through contrastive practical measures for teachers and Mandarin learners of English to overcome challenges resulting from the two systems' differences. The most effective method of foreign language teaching is the comparative teaching of Chinese and foreign languages [2]. Consequently, through the comparison of vowel systems, students will understand how to pronounce English vowels accurately and authentically, and teachers will have a more transparent map in TESOL.

## 2. Contrastive Analysis of English and Mandarin Vowel Systems

### 2.1. A Brief Introduction of English and Mandarin Vowel Systems

Vowel sounds are produced with a relatively free flow of air, and no turbulence or a total stopping of the air can be perceived. In contrast, consonant sounds are mostly articulated via closure or obstruction in the vocal tract [3]. Vowels serve as the nucleus of syllables, and directly carry supra-segmental features such as stress and intonation in speech. Mastery of vowels can significantly affect the accuracy of pronunciation and the effectiveness of communication. To describe vowels, the auditory-acoustic vowel-space diagram is superimposed on an articulatory mouth diagram according to the tongue position and lip shape.

#### 2.1.1. English and Mandarin Monophthongs

Monophthongs are pure vowels that can exist independently in a syllable without combining with other vowels [4]. There are 12 monophthongs in English, which can be classified according to qualities, like height, lip shape, peripherality and length. The English international phonetic alphabet (IPA) vowel chart is as follows:

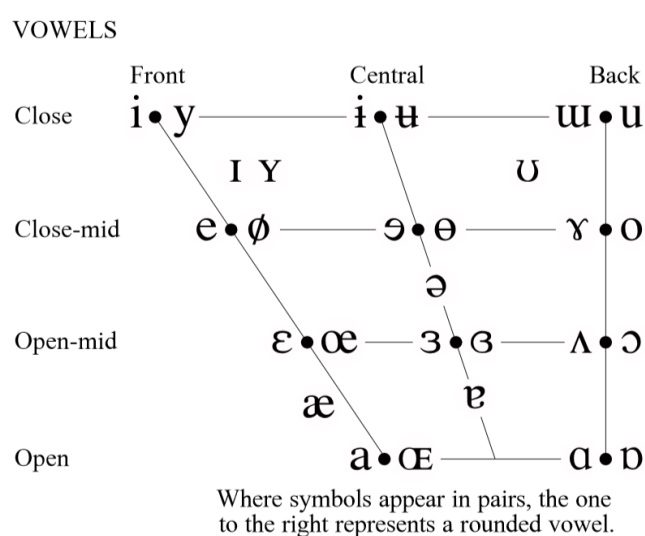


Figure 1: English IPA Vowel Chart [5].

Mandarin is a group of Chinese dialects natively spoken across most of northern and southwestern China. Unlike English, the basic unit distinguishing between meanings is the syllable with a particular tone, composed of an initial consonant and a final vowel [6]. For the convenience of comparison, the following text will convert Chinese finals to a vowel system. Chinese finals include single finals and compound finals, which correspond to monophthongs and diphthongs in English, respectively. There

are ten main monophthongs in Mandarin, displaying three distinctive features: compact-diffuse; grave-acute; flat-plain [7]. The Mandarin IPA vowel chart is as follows:

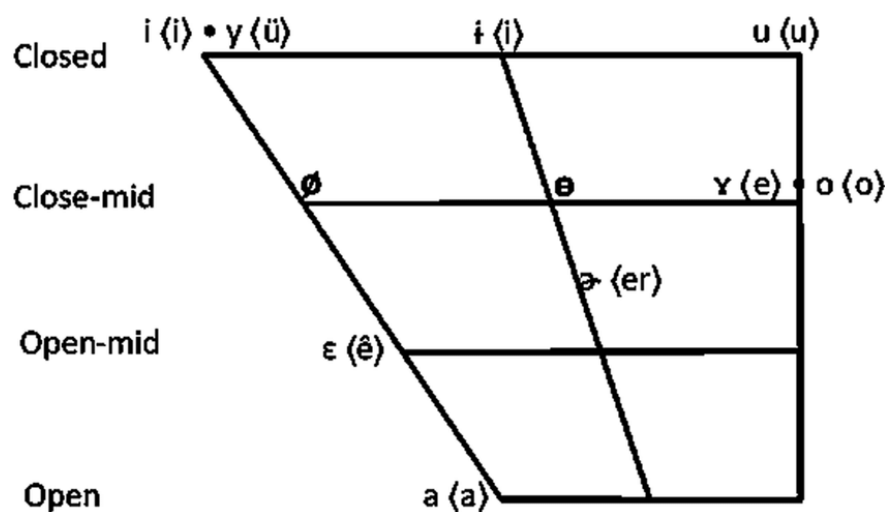


Figure 2: IPA and Pinyin chart for Mandarin vowels [8].

### 2.1.2. English and Mandarin Diphthongs

A diphthong is a combination of two adjacent vowel sounds within the same syllable. Diphthongs can be classified into different types: falling and rising; closing, opening, and centering; narrow and wide; short and long. In English, the utterance of a diphthong involves movements from one vowel to another within a single syllable [9]. There are eight diphthongs in English: /eɪ/, /aɪ/, /ɔɪ/, /ɪə/, /eə/, /ʊə/, /əʊ/, which can be classified into centering diphthongs and closing diphthongs. Closing diphthongs like /eɪ/, /aɪ/, /ɔɪ/, /ʊə/, /əʊ/, and /aʊ/ tend to be falling, and the second element is closer than the first. Centering diphthongs like /ɪə/, /eə/, and /ʊə/ are ones that begin with a more peripheral vowel and end with a more central one.

There are nine diphthongs in Mandarin, which can be classified into closing and opening diphthongs. Closing diphthongs include /eɪ/, /aɪ/, /ao/, /ou/. Opening diphthongs are generally rising, and the second element is more open, including /ia/, /ua/, /uo/, and /üe/ [4].

## 2.2. Comparison of Vowel Systems of English and Mandarin

### 2.2.1. Comparison of English and Mandarin Monophthongs

To begin with, there are many similar sounds between the monophthonic systems of Mandarin and English, for example, the Chinese /i/ and the English /i/ and /ɪ/; the Chinese /u/ and the English /u/ and /ʊ/. Nevertheless, in actuality, differences exist between these seemingly similar sounds. Regarding height in sound quality, the Mandarin /i/ sound is pronounced with the tongue positioned higher than the one in English, and the shape of the lip is flatter, which means that there is a slight friction in pronouncing Chinese /i/. Regarding lip shape, the Mandarin /u/ sound is pronounced with a smaller mouth opening than the English /u/ sound, and the back of the tongue is raised higher, almost touching the soft palate. When the airflow rushes out of the mouth, there is friction between the lips.

There are also some vowel sounds in English that are utterly different from those in Mandarin. Eight English monophthongs cannot be found in Mandarin vowel systems: /ɪ/, /æ/, /ɜ/, /ə/, /ʌ/, /ʊ/, /ɔ/, /ɑ/. Besides, it is essential to note that the mouth opening of /æ/ is about twice that of the /e/ sound and can be extended in length, making it the longest of all short vowels. The English /ʌ/ sound is

another sound not found in Mandarin, and students may mistakenly use a variation of the Mandarin /a/ sound to replace it. However, the actual /ʌ/ sound has a smaller mouth opening.

### 2.2.2. Comparison of English and Mandarin Diphthongs

English and Mandarin diphthongs are pronounced at different durations and are respectively timed by stress and syllable [10]. When pronouncing diphthongs, each syllable in Mandarin is pronounced nearly equally in terms of time, and each syllable is balanced. However, stress is used as a unit in English, and the time used for stressed syllables is the same. The duration of English diphthongs is equal to that of a long vowel, and the first sound is much longer than the second. On the other hand, Mandarin diphthongs are generally shorter in duration, with a quick transition between the two sounds and an unclear boundary. It feels like a sound articulated between the two sounds.

## 3. Challenges That the Differences Present to Second-language Learners

On account of this similarity in monophthongs of English and Mandarin, on the one hand, students can consciously use this similarity for phonetic transfer and acquire pronunciation quickly in a short time. On the other hand, this similarity can easily lead students to mistakenly believe that they are the same sounds and use corresponding Mandarin sounds to replace the proper pronunciation, affecting the acquisition of a native-like accent. For example, Chinese students may replace the English /i/ and /ɪ/ with the Chinese /i/, the English /u/ and /ʊ/ with the Chinese /u/, and the English /e/ with Chinese /ê/. Chinese-speaking students may struggle to distinguish between these sounds when first learning them.

The vacancy in monophthongs between English and Mandarin may generate difficulties for students to distinguish between sounds when first learning them. Specifically, due to the absence of /æ/, bad /bæd/ is frequently pronounced like bed /bed/ by Chinese students. Furthermore, the absence of /ʌ/ leads students to pronounce cut /kʌt/ like cart /kɑ:t/ because students mistakenly use a variation of the Mandarin /a/ sound to replace /ʌ/. On the other hand, the absence of a similar sound in Mandarin can also eliminate interference and help to acquire a native-like accent from the beginning.

The distinctive feature of English diphthongs results in Chinese students struggling to pronounce English diphthongs correctly. In English diphthongs, the first sound is longer than the second. However, Chinese students tend to pronounce the two phonemes in a diphthong with equal time endurance. Besides, they tend to pronounce English diphthongs with a shorter length, which are pronounced like monophthongs. Specifically, the diphthong /eɪ/ is confused with monophthongs /i/, /e/, and /æ/. Chinese students may pronounce the word chain /tʃeɪn/ like chin /tʃɪn/, feel /feɪl/ like /fail/ /fi:l/, jane /dʒeɪn/ like jean /dʒi:n/. The diphthong /aɪ/ is confused with the monophthong /æ/. Chinese students may pronounce kite /kaɪt/ like cat /kæt/.

## 4. Corresponding Solutions

### 4.1. Attaching Importance to the Contrast of English and Mandarin Vowel Systems in TESOL

According to the aforementioned analysis, differences between English and Mandarin vowel systems are significant, negatively impacting English phonetics teaching. The reason is the negative transfer of Chinese as a native language (L1) to English as a second foreign language (L2) in the process of second language acquisition [11]. Lack of appropriate guidance will generate communicative barriers and lead to “fossilization”. A concrete manifestation of fossilization is that second-language learners never reach native-language learners’ level of proficiency [12]. Therefore, teachers should coach

students to carefully analyze the differences and understand the negative transfer effect to overcome it actively.

In the acquisition of English, Chinese students often maintain that Mandarin pronunciation habits are universal, which can also be applied to English. Consequently, there is a need to help students recognize the characteristics shared by English and Mandarin, as well as those unique to English or Mandarin. In phonology teaching, teachers should first carefully analyze students' pronunciation errors and the impact of negative language transfer. Educators can help students compare similar vowel sounds in both languages, for instance, the Chinese /i/ and English /i/, the Chinese /u/ and English /u/, the Chinese /ê/ and English /e/ before identifying subtle differences between similar sounds. Additionally, educators should also help students recognize the unique sounds in English, like /ɪ/, /æ/, /ɜ/, /ə/, /ʌ/, /ʊ/, /ɔ/, /ɑ/. To achieve the above purposes, teachers can assist students by describing the articulation location and organs in detail. Accordingly, second-language learners will have a basic framework for the tongue's height and position when articulating English vowels.

Students can also be asked to practice the pronunciation of English vowels in front of a mirror to rectify their lip shapes. Teachers can choose famous sayings, short poems, tongue twisters, or songs containing specific monophthongs and diphthongs as phonetic exercises. For example, sayings like "Better late than never.", "No pains, no gains." and "You must hit the nail on the head." can help students have a better understanding of English vowels /eɪ/ and /e/ [13]. Meanwhile, such exercises are beneficial to increasing the enjoyment and interactivity of classes.

Furthermore, teachers can play more video clips with authentic English sounds in class, allowing students to imitate the vowel sounds of native English speakers and carry out extensive listening, reading, and speaking activities to increase the input of the target language (English) to students. Accordingly, students can be exposed to and store sufficient correct pronunciation in their minds, which will play a crucial role as standard forms for them to imitate.

#### **4.2. Utilizing Various Educational Technologies to Assist English Phonetic Teaching**

Second-language learners are being tormented by countless boring exercises, complicated phonetic symbols, and abstract phonetic knowledge in traditional phonetic teaching. In light of the problems in English phonetics teaching and the inspiration of multimodal discourse theory, researchers are currently committed to developing and practically applying speech visualization software.

Praat, a widely-used computer software package for speech analysis in phonetics, can transform abstract sounds into visual symbols. Second-language learners can record mono or stereo sounds, import them into Praat, and then compare and correct their pronunciation with standard pronunciation through oscillograms. Researchers have concluded that the application of Praat in actual English segmental phonetic teaching can reduce the difficulty of phonetic teaching by visualizing the teaching process, prodigiously motivate students' enthusiasm towards English phonology, and improve the acquisition of standard vowel sounds [14].

In addition, much splendid speech visualization software has been developed, such as Praat, Speech Analyzer, Wavesufer, and Betteraccent Tutor, which can act as assistance in phonetic teaching. English educators should utilize speech visualization software to supervise students' errors when articulating certain vowels in class, and propose concrete and personalized recommendations for improvement [15]. Schools can add several corresponding phonetic courses and strengthen training on how to master some auxiliary software for phonetic learning, such as Praat software, to help students have a solid command of phonetic knowledge and correct their pronunciation problems. Second-language learners can also take the initiative to utilize Praat as a method of independent study. Nevertheless, different learning strategies, and affective variables such as anxiety, self-esteem, and motivation of various second-language learners will have an impact on the learning effect.



## 5. Conclusion

One of the biggest hindrances in English phonetic learning for Chinese learners is the English vowel system. Huge differences between English and Mandarin vowel systems have significantly impeded the acquisition of a native-like accent. Through a thorough comparison of the two systems, including monophthongs and diphthongs, this paper illuminates the challenges students may encounter, containing the similar and distinctive monophthongs and diphthongs in both languages. Additionally, the paper proposes corresponding solutions for TESOL, including attaching importance to the contrast of English and Mandarin vowel systems and utilizing various educational technologies to assist English phonetic teaching.

Nevertheless, this paper only covers topics on the vowel system, while the whole phonological system contains much more significant spheres like consonants and supra-segmental phonemes such as stress, tone, intonation, pitch, and length. Consequently, future research will focus on the comparison of other segmental phonemes and supra-segmental phonemes of English and Mandarin before proposing implications for TESOL.

In conclusion, this paper sheds light on the challenges second-language learners may encounter through the contrastive analysis of English and Mandarin vowel systems, and functions to illuminate several feasible solutions.

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