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Course: LT5401 Phonetics and Phonology
Assignment title: Comparison of the Sound Systems of British English and Mandarin Chinese

There is a common practice for Chinese-speaking English beginners in China, that is, to use the similar Mandarin pinyin letters to signal the pronunciation of the English sounds in words. Although to some degree it helps to memorize some new pronunciations effectively, some of the Mandarin pinyin letters are not the same as the corresponding English letters in the indication of the phonetic properties of the sounds. In this essay, we will discuss the subtle differences of the phonetic characteristics of the consonants and vowels between British English and Mandarin Chinese.

1. Consonants

As shown in Table 1, there are 24 consonants in British English and 22 in Mandarin Chinese. Among these consonants, only some of them, namely the bilabial stops [p]/[p^h], alveolar stops [t]/[t^h], velar stops [k]/[k^h], bilabial nasal [m], alveolar nasal [n], velar nasal [ŋ], labio-dental fricative [f] and alveolar lateral approximant [l], are the same in the two languages. It should be noted that all the consonants of each language presented in Table 1 can occur in the word- or syllable-initial position, except for the velar nasal [ŋ].

Table 1: Consonant sounds in British English and Mandarin Chinese.

		bilabial	labio-dental	dental	alveolar	Post-alveolar	retroflex	(alveolo-) palatal	velar	glottal
stop	BE	p/p^h b			t/t^h d				k/k^h g	
	MC	p^h p			t^h t				k^h k	
nasal	BE	m			n				ŋ	
	MC	m			n				ŋ	
fricative	BE		f v	θ ð	s z	ʃ ʒ				h
	MC		f	s			ʂ ʐ	ɕ	x	
affricate	BE					tʃ dʒ				
	MC			ts^h ts			$ʈʂ^h$ ʈʂ	$tɕ^h$ tɕ		
approximant	BE	w				ɹ		j	w	
	MC									
lateral approximant	BE				l					
	MC				l					

Notes:
1. BE stands for British English and MC stands for Mandarin Chinese.
2. The classification of the consonants in English and Chinese is based on Ladefoged and Johnson (2015) and Hu (1981).
3. Except for [p, t, k, ts, ʈʂ, tɕ], the symbols on the right in the groups are voiced.

1.1 Differences between the consonants in English and Chinese

Stop In British English, there are voiced [b d g] and voiceless [p t k] stops, and every voiceless stop has both unaspirated and aspirated allophones which are in complementary distribution with no effect on word meaning. In Mandarin Chinese, there isn't any voiced stop, but there are two groups of voiceless stops, the unaspirated [p t k] and aspirated [p^h t^h k^h]. So, while both languages have bilabial, alveolar and velar stops, only the aspirated stops are pronounced the same. For the unaspirated stops, the three voiced ones, namely, [b d g] as in *bee*, *dog* and *guy* in British English are different from those represented with the Chinese pinyin letters *b d g* as in *bi* 比 'compare', *dao* 到 'arrive' and *gai* 钙 'calcium' which are the voiceless [p t k] instead in Mandarin Chinese.

Fricative There are nine fricatives in British English and six in Mandarin Chinese. In British English there is a voiced labio-dental fricative [v] as in *verb*, which doesn't exist in Mandarin Chinese. In some areas of northern China (e.g. Beijing), a voiced labio-dental approximant [ʋ] often appears as an allophone of [w], except when it is followed by [o] (Duanmu San, 2000). In this case [ʋan] and [wan] both mean 碗 'bowl'. Nonetheless, [ʋ] is a frictionless approximant sound in Mandarin Chinese, different from the fricative [v] in English.

Both British English and Mandarin Chinese have dental consonants, but none of them are the same in the two languages. Mandarin-speaking English learners in China usually mispronounce the English [θ] as the Chinese [s], since they are both voiceless dental fricatives. The difference between them is the position of the tongue tip/blade. In British English, the tongue tip/blade is stuck out of the mouth between the upper and lower front teeth, forming a narrow gap when articulating [θ] as in *theme*, while in Mandarin Chinese, the tongue tip is placed behind the back of the upper front teeth, and the upper and lower front teeth are very close to each other forming a narrow gap for articulating [s] as in *si* 四 'four'. As for the voiced dental fricative [ð] as in *those* in English, it doesn't appear in Chinese.

Both the voiced and voiceless alveolar fricatives [s] as in *say* and [z] as in *zoo* are unique in British English, too. Although there is a fricative represented with the same symbol [s] in both languages, in Chinese it is dental while in English it is alveolar.

[ʂ ʐ][1] are represented with the pinyin letters *sh* and *r* respectively in Mandarin Chinses, for example *she* 蛇 'snake' and *re* 热 'hot', and hence they are the same as the consonant letters '*sh*' and '*r*', representing [ʃ ɹ] as in '*ash*' and '*red*', in English, and it may be the reason why they are hard to be distinguished by some Chinese learners of English. The English [ʃ ʒ] and the Chinese [ʂ ʐ] differ in place of articulation, where the former ones are post-alveolar while the latter ones are retroflex.

In Chinese there are three unique voiceless alveolo-palatal sounds: the fricative [ɕ] and two affricates, aspirated [tɕʰ] and unaspirated [tɕ], as in *xi* 西 'west', *qi* 七 'seven' and *ji* 鸡 'chicken' respectively.

As for the velar and glottal consonants, the English [h] as in *'high'* and the Chinese [x] as in *hai* 害 'harm' form another similar pair. They are both voiceless fricatives, but [h] is a glottal consonant and [x] is a velar consonant.

Affricate In addition to [tɕʰ] and [tɕ], both the aspirated and unaspirated voiceless dental affricates [tsʰ] and [ts], as in *cou* 凑 'collect' and *zou* 走 'walk' respectively, only occur in Chinese, but not English.

[ʈʂ ʈʂʰ] are represented with *zh* and *ch* in Chinses pinyin, for example *zhe* 这 'this' and *che* 车 'vehicle' respectively. It is confusing for some Chinese speakers to distinguish between the Chinese [ʈʂ ʈʂʰ] and the English [dʒ tʃ]. The English [tʃ] is a diphone combined with a retracted [t] and a post-alveolar [ʃ], forming a voiceless post-alveolar affricate, while the Chinese [ʈʂʰ] is a diphone combined with a retroflex [ʈ] and a retroflex [ʂ], forming an aspirated voiceless retroflex diphone. Following the same principle, [dʒ] is a voiced post-alveolar affricate, while [ʈʂ] is an unaspirated voiceless retroflex affricate. As far as I am concerned, the four sounds [ʈʂ ʈʂʰ ʂ ʐ] in Mandarin are articulated more backwards than the

[1] According to Hu (1981) and Qi (2007), the Mandarin 'r' is considered as a voiced fricative and represented with the symbol [ʐ], instead of the approximant [ɻ].

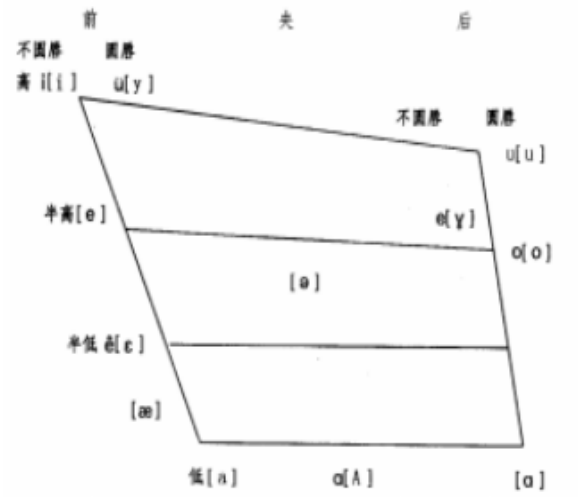
postalveolar [dʒ tʃ] in English, with the curled tongue tip toward to the front of the hard palate, instead of with the retracted tongue blade to the back of the alveolar ridge.

Approximant According to Hu (1981) and Qi (2007), there are no approximants [w j] in Mandarin Chinese. While in the Chinese pinyin system, the letters *w* and *y* are considered as the initial consonants of syllables, the Chinese linguists classify them as the allophones the high vowels [u i] when they occur in the syllables without a syllable-initial consonant. English has both the approximants [w] and [j]. The English [w] as in '*wood*' has double place of articulation as a voiced labial-velar approximant. The English [j] as in '*yes*' is a voiced palatal approximant.

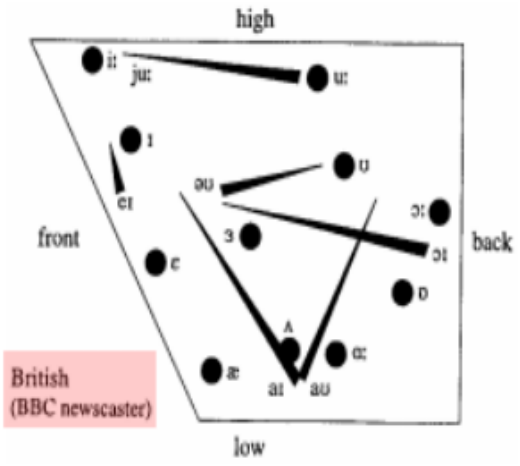
2. Vowels

In the Chinese syllables, the rime part, excluding the syllable-initial consonant, may contain a 'simple' vowel, a 'complex' vowel or a sequence of a simple/complex vowel followed by a final nasal consonant. A 'simple' vowel is a monophthong, whereas a 'complex' vowel is a diphthong or triphthong. According to the head vowel in the different rime types, the rimes are divided into *Cuokouhu* (with a head vowel [y]), *Kaikouhu* (without a head vowel), *Qichihu* (with a head vowel [i]) and *Hekouhu* (with a head vowel [u]). In English, there are two kinds of vowels: monophthongs and diphthongs, and both can be followed by a consonant or consonant cluster in the syllables.

Figure 1: Vowels in Mandarin Chinese and British English.



Mandarin Vowels (Qi Huyang, 2007, P58)



English Vowels (Peter L. 2015, P96)

2.1 Monophthongs

As shown in Figure 1, Chinese has ten monophthongs: [i u y ɛ o ɤ A[2] ɿ ʅ ɚ] with the first seven of them as the basic monophthongs and the latter three as the special vowels, while in English there are eleven: [i u ɪ ʊ ɛ ɜ ɔ æ ʌ ɑ ɒ]. In Mandarin Chinese, there is only one high front unrounded [i], as in *ying* 英 'Britain', while in British English there are a tense high front unrounded [i] as in '*beat*' and a lax form [ɪ] as in '*bit*'. Similarly, in Mandarin Chinese there is only one high back rounded [u] as in *shu* 书 'book', while in British English there are a tensed high back rounded [u] as in '*boot*' and a lax [ʊ] as in '*good*'.

[2] A non-IPA symbol [A] is commonly used for representing the centralized low vowel [a] in Chinese. The vowel can be represented as [a̱] in IPA.

In Chinese but not English, there is a high front rounded [y] as in *yu* 鱼 'fish'.

As for the mid vowels, both languages have exactly the same mid-low front unrounded [ɛ] as in '*head*' and *qie* 切 'cut'. There are two other basic mid-high back vowels in Chinese: the unrounded [ɤ] as in *se* 色 'color' and the rounded [o] as in *wo* 我 'me'. In English, the mid back vowels include the rounded [ɔ] as in '*port*' and the central unrounded [ɜ] as in 'herd'.

For the low vowels, in Chinese, there is a low central unrounded [A] as in *da* 大 'big', while in English a similar low central unrounded vowel [ʌ] as in '*bud*' has a slightly higher tongue position. The Chinese [A] has the allophones [ɑ] and [a] when it occurs in a respective back and front environment. English has more low vowels than Chinese: the low front unrounded [æ] as in '*mat*' is articulated like in between the mid-low front unrounded [ɛ] and low front unrounded [a]; and [ɑ] as in 'hard' and [ɒ] as in 'hod' are both low back vowels, while the latter is rounded.

There are three special vowels [ɿ ʅ ɚ] in Chinese, where the first two are not distinguished by most Chinese speakers. These two vowels are represented with the same pinyin letter *i* which is also used for representing the basic vowel [i]. [ɿ], as in *zi* 字 'character', *ci* 词 'word' and *si* 思 'think', is articulated with the raised tongue tip behind the back of the upper front teeth and with lip spreading. [ʅ], as in *zhi* 只 'only', *chi* 吃 'eat' and *shi* 师 'teacher', is articulated with the curled tongue tip toward to the front of the hard palate and with some lip rounding. The sound [ɚ], a mid central unrounded rhotic vowel, occurs singly in a word like *er* 耳 'ear'. It also refers to the rhotic accent of Mandarin Chinese, represented with the pinyin letter *r*, like *huar* 花儿 'flower'.

2.2 Diphthongs and triphthongs

Diphthongs and triphthongs are vowel combinations of two or three monophthongs. In Ladefoged and Johnson (2015), they are described as 'movements from one vowel quality to another', so it is easy to know the way of articulation of these kinds of vowels with reference to the description of the monophthongs. Here we will only mention some special types of diphthongs and triphthongs in Chinese and English.

2.2.1 Similar diphthongs in Mandarin Chinese and British English

There are 9 diphthongs in both Mandarin Chinese: [ai ei ɑu ou iA iɛ uA uo yɛ] and British English [ju eɪ aɪ əʊ ɔɪ aʊ ɪə ɛə aə/aɪə], but none of them is the same in the two languages. The Mandarin Chinese [ai ei ɑu ou] as in *kai* 开 'open', *bei* 北 'north', *gao* 高 'high' and *hou* 猴 'monkey', are often considered similar to the British English [aɪ eɪ aʊ əʊ], as in '*hide, hay, how, hoe*' respectively. As shown in the IPA transcription, in Mandarin Chinese, the former two are pronounced with a high tense [i] which corresponds to a high lax [ɪ] in British English. Since there is no distinction between the tense and lax forms of [i] and [ɪ] in Chinese, the Chinese [ai ei] and the English [aɪ eɪ] are considered as the same for some Chinese people. The Chinese [ɑu] and the English [aʊ] have a difference in the first low vowel component, which is more backwards in Chinese than in English. In Chinese, the vowel [ɑ] is referred to a '*hou a*' ('back a') and as an allophone of the basic vowel [A] when it occurs in a back environment. The diphthongs [ou] in Chinese and [əʊ] in English also have a difference in the first vowel component, which it is a mid-high back rounded [o] in English but a mid central schwa in English.

2.2.2 Diphthongs unique in British English

In British English, [ɔɪ] in '*boy*' is a diphthong that is formed with two basic monophthongs in the language. As for the diphthongs [ɪə ɛə aə/aɪə], they occur in the words with a final '*-r/-re*' in the non-rhotic British accent, such as in '*here, there, hire*' (Ladefoged and Johnson, 2015:101). In English, [ju], as in '*youth*', differs from all the other diphthongs in that its most prominent part occurs at the end.

2.3 Other vowels in Mandarin Chinese

Except for the nine diphthongs mentioned above, Mandarin Chinese has four triphthongs [iɑu iou uɑi uei] as in *miao* 秒 'second', *you* 有 'have', *huai* 坏 'bad' and *wei* 喂 'feed', and sixteen rimes with a vowel or diphthong followed by a nasal ending [n] or [ŋ]: [an ən in yn iɛn uan yɛn uən ɑŋ əŋ iŋ uŋ yŋ iɑŋ uɑŋ uəŋ]. While British English also has rimes with a vowel or diphthong followed by a consonant, it has no triphthongs. Another unique characteristic of Mandarin Chinese with respect to the vowels is that the three basic monophthongs [A ɤ u] represented with the pinyin letters *a, e, u* respective have various types of allophones.

***a* [A]** The pinyin letter *a* in Mandarin Chinese is pronounced as: (a) a low central unrounded [A] when it occurs in open syllables followed by no sound, as in [A] (*a* 啊), [iA] (*xia* 夏 'summer') and [uA] (*hua* 花 'flower'); (b) a low front unrounded [a] when it precedes a vowel [i] and a nasal ending [n], as in [ai] (*hai* 孩 'child') and [an] (*han* 喊 'shout'); (c) a low back unrounded [ɑ] when it precedes a vowel [u] and a nasal ending [ŋ], as in [ɑu] (*hao* 好 'good'), [iɑu] (*biao* 表 'watch'), [ɑŋ] (*hang* 行 'row') and [uɑŋ] (*huang* 黄 'yellow'); (d) a mid-low front unrounded [ɛ] when it is in between a vowel [i] or [y] and a nasal ending [n], as in [iɛn] (*xian* 线 'string') and [yɛn] (*yuan* 圆 'circle').

***e* [ɤ]** The pinyin letter *e* is pronounced as: (a) a mid-high front unrounded [e] when preceding a vowel [i], as in [ei] (*hei* 黑 'black') and [uei] (*gui* 贵 'expensive'); (b) a mid-low front unrounded [ɛ] when it follows a vowel [i] or [y], as in [iɛ] (*ye* 夜 'night') and [yɛ] (*yue* 月 'moon'); (c) a mid central unrounded [ə] when it precedes a final [n] or [ŋ], as in [ən] (*ben* 笨 'stupid'), [uəŋ] (*dun* 盾 'shield), [əŋ] (*neng* 能 'can') and [uəŋ] (*weng* 翁 'old man'); (d) a mid-high back unrounded [ɤ] when it appears alone, as in *e* 鹅 'goose'.

***u* [u]** The pinyin letter *u* is pronounced as: (a) a high back rounded [u] when it functions as the dominant vowel in a rime, as in *gu* 古 'ancient', *kun* 困 'sleepy' and *kong* 空 'empty'; (b) a semivowel [w] when it is the head vowel in a rime without an initial consonant, as in *wai* [wai] 歪 'inclined' and *wan* [wan] 玩 'play', and in this case it is written as *w* in Chinese pinyin; (c) a little lower high back rounded [ʊ] when it is the final sound in a triphthong, as in *you* [ioʊ] 有 'have' and *yao* [iɑʊ] 要 'ask for'.

3. Conclusion

In conclusion, most of the consonants in Mandarin Chinese and British English are in common, and the most significant differences between the two languages are: firstly, Mandarin Chinese has fewer voiced consonants (only [m n ŋ ʐ̩ l]) and differs from British English a lot in stops and affricates; secondly, the post-alveolar consonants in British English correspond to the retroflex consonants in Mandarin Chinese; thirdly, the approximants in British English are considered semivowels or allophones of the basic high monophthongs in

Mandarin Chinese. For vowels, Mandarin Chinese and British English have different vowel system and structure. Although most of the vowels are not in common in the two languages, the monophthongs in British English (except for [æ] and [ɔ]) do occur as part of the complex vowels (diphthongs and triphthongs) in Mandarin Chinese. Such vowels are more often considered the allophones of the basic monophthongs in Mandarin Chinese.

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