PERCEPTION OF ENGLISH MONOPHTHONGS BY NATIVE SPEAKERS OF MANDARIN

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ABSTRACT

This study explores the perception of English monophthongs by native speakers of Mandarin (hereafter NSMs). The data were collected at the phonetics laboratory at Jiangsu University of Science and Technology (hereafter JUST), China. The results reveal that the overall percentage of correct vowel perception is 81.2%, that the phonetic contexts affect the subjects' vowel perception, and that the best perceived monophthongs are /uː/, /ɑː/, /iː/ and /ɪ/, while the worst perceived ones are /æ, /ʌ/ and /ɒ/. These findings have implications for the teaching of EFL phonetics to NSMs in China.

Keywords: English monophthongs, perception, native speakers of Mandarin

1. INTRODUCTION

Speech perception often bears an intimate relation to speech production, and it has often been claimed that learners' perception of L2 phonetic segments may affect the accuracy with which these segements are produced [4, 5, 13, 15]. The role of perceptual phenomena as a source of explanation for cross-linguistic phonological patterns has, in recent years, become an increasingly active area of research in phonological theory [3, 7, 8, 10, 14, 16], and there are a number of empirical studies on the phonological misperceptions of EFL learners from some parts of Asia, such as Korea [11, 16], Japan [6], Taiwan [2], Hong Kong [1, 9], etc. These studies have not only revealed evidence for these L2 learners' characteristic perceptual interlanguage in phonology but also shed light on L2 English pronunciation teaching in these areas. China has millions of Mandarin- speaking EFL learners and study of their L2 perceptual competence is quite sparse so far. Accordingly, an experimental study of the perception of all the 44 British English (BE) segments was conducted to a group of NSMs in JUST in November, 2010, and this paper reports some findings on the perception of monophthongs by the subjects. Mainly, it intends to address the following questions:

1. To what extent can NSMs perceive English monophthongs correctly?
2. Do the phonetic contexts affect NSMs' monophthong perception?
3. Which are the best and the worst perceived English monophthongs?

2. METHOD

2.1. Subjects

The subjects of the present study were 81 Junior English majors from JUST. All are native speakers of Mandarin aged from 21 to 24 (Mean=22.4). They began to learn English at about age 10 in Chinese Primary Schools with native Mandarin-speaking instructors and all their non-English courses were given in Mandarin. They have lived in mainland China and never been to any English-speaking countries, but they had been exposed to a large number of authentic oral materials spoken by native speakers of English since they were enrolled as English majors two and a half years ago. 94% of them had passed the nationwide Test for English majors (Band 4) four months before the perception test and could be regarded as mid-level or low advanced English learners in China on that basis.

2.2. Stimulus materials

The materials for the perception test were 12 BE monophthongs distributed in three phonetic contexts, i.e. syllable/word initial, medial and final. According to their places of articulation, the monophthongs are divided into 3 categories: front, central and back vowels. The target vowels were embedded in 30 high-frequency English words as typical carrier words, the majority of which were abstracted from the Longman Pronunciation Dictionary [17] (see Table 1). Then, the carrier words were read by a phonetician who is a native speaker of British English and recorded via CoolEditPro12a Software in the sound booth of the phonetics lab at JUST. Each word was presented

twice with a 3-second interval before the next word so that the subjects had enough time to read all the 8 multiple choices[1] on the response sheet and tick the right one. The recording of the monophthong part lasted 216 seconds.

Table 1: The carrier words with target vowels for the perception test.

POA	vowel	Carrier words		
		Initial	Medial	Final
Front	iː	eat	heed	tea
	ɪ	it	hid	city
	e	egg	head	～
	æ	anger	had	～
Central	ʌ	utter	Hudd	～
	əː	early	heard	stir
	ə	again	banana	mother
Back	ɑː	arch	hard	star
	ɒ	odd	hod	～
	ɔː	author	Hawed	war
	ʊ	～	hood	～
	uː	ooze	who'd	Sue

Notes: POA: places of articulation;
～: the vowel does not appear in this context.

2.3. Procedures

The perception test was carried out in one afternoon in the phonetics lab at JUST. The 81 subjects were randomly divided into two groups: 40 in one group and 41 in the other. The groups did the test successively and followed the same presentation and instructions. The test consisted of three steps. First, they were given a written copy of the perceptual response sheet, on which there were 30 items. Each item had a set of 8 phonetic transcriptions to go with one carrier word in the recording. The subjects were then instructed to listen to the recording via Sony DR-320D headphones. During their decoding of the phonetic signal of each carrier word, they were required to choose the right transcription out of the 8 candidates to indicate the vowel they heard.The recording played non-stop, and the response sheets were collected at the end of the test.

3. RESULTS AND DISCUSSIONS

3.1. Overall percentage of correct perception of BE monophthongs

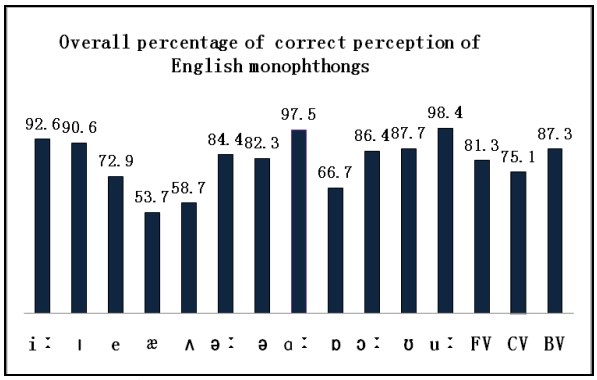
Figure 1 and Table 2 shows the overall percentage of correct perception of the 12 target vowels by 81 native speakers of Mandarin. Their average correct perception of front, central and back vowels are 81.3%, 75.1% and 87.3 % respectively, and their total correct percentage is 81.2%. This indicates that the subjects were in general competent in perceiving English monophthongs in carrier words, though there were variations in their perception of individual items.

Table 2: The overall percentage of correct perception of English monophthongs.

POA	**Target vowels**	**English words**			**Average**		
		Initial	**Medial**	**Final**	**Item**	**CM**	**TM**
FV	**iː**	**81.5**	**98.8**	**97.5**	**92.6**	**81.3**	**81.2**
	ɪ	**92.6**	**91.4**	**87.7**	**90.6**		
	e	**71.6**	**74.1**	**～**	**72.9**		
	æ	**50.6**	**56.8**	**～**	**53.7**		
	mean	**74.1**	**80.3**	**92.6**			
CV	**ʌ**	**70.4**	**46.9**	**～**	**58.7**	**75.1**	
	əː	**75.3**	**86.4**	**91.4**	**84.4**		
	ə	**87.7**	**87.7**	**71.6**	**82.3**		
	mean	**77.8**	**73.7**	**81.5**			
BV	**ɑː**	**96.3**	**97.5**	**98.8**	**97.5**	**87.3**	
	ɒ	**60.5**	**72.8**	**～**	**66.7**		
	ɔː	**70.4**	**93.8**	**95.1**	**86.4**		
	ʊ	**～**	**87.7**	**～**	**87.7**		
	uː	**100**	**98.8**	**96.3**	**98.4**		
	mean	**81.8**	**90.1**	**96.7**			

Notes: POA=place of articulation, FV=front vowel, CV=central vowel, BV=back vowel CM=category mean, TM=total mean

Figure 1: The overall percentage of correct perception of English monophthongs.



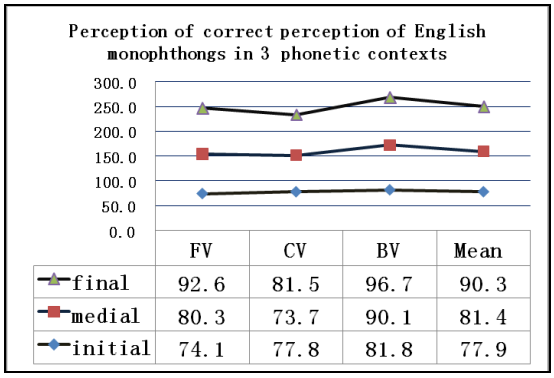
Notes: FV=front vowels CV=central vowels BV=back vowels

3.2. Effects of phonetic contexts on the vowel perception

To explore the effects of phonetic contexts on the subjects' perception of English monophthongs, their correct perception of the target vowels in 3 phonetic contexts was calculated. The results are as follows (see Figure 2): the average correct perception of front, central and back vowels in the initial context are 74.1%, 77.8% and 81.8%, in the medial context 80.3%, 73.7% and 90.1%, and in the final context 92.6%, 81.5% and 96.7%. The total mean of correct perception of all the 12 vowels in three contexts is 77.9% (initial), 81.4% (medial) and 90.3% (final). This suggests that NSMs perceived the syllable/word final vowels

much better than those in the medial and initial contexts.

Figure 2: Effects of phonetic contexts on monophthong perception.



	FV	CV	BV	Mean
final	92.6	81.5	96.7	90.3
medial	80.3	73.7	90.1	81.4
initial	74.1	77.8	81.8	77.9

3.3. Best and worst perceived English monophthongs

Table 2 and Figure 1 also show the NSMs' correct perception of each of the vowels individually. The correct perception rate for the 4 front vowels (iː, ɪ, e, æ) was 92.6%, 90.6%, 72.9% and 53.7%; for the central ones (ʌ, əː, ə) 58.7%, 84.4% and 82.3%; and for the back ones (ɑː, ɒ, ɔː, ʊ, uː) 97.5%, 66.7%, 86.4%, 87.7% and 98.4% respectively That is, the correct vowel perception varied from 53.7% to 98.4%. Accordingly, the best perceived monophthongs are /uː/ (98.4%), /ɑː/ (97.5%), /iː/ (92.6%) and /ɪ/ (90.6%), whereas the worst perceived ones are /æ/ (53.7%), /ʌ/ (58.7%) and /ɒ/ (66.7%). It can be assumed that the NSMs were having a much easier time in recognizing long vowels than short vowels, including /ɔː/ (86.4%) and /əː/ (84.4%), and that they were most hindered by the short vowels between open-mid and open areas in terms of tongue height [18] (see Figure 3). The satisfactory perception of long vowels may be due to two factors. First, long vowels are usually more prominent in their phonetic realization, therefore they are perceived more easily. Second, the English long vowels /iː, ɑː, uː/ are found quite equivalent to the vowels in the Mandarin phonological system [12] (see Figure 4). And the inaccurate perception of those open-mid and mid short vowels might result from the facts that, unlike in English, vowel length is not a distinctive feature in the Mandarin phonetic system. Besides, Mandarin has a much smaller vowel inventory than English (see Figure 4) [12]. No doubt, the marked difference between the English and Mandarin vowel systems is prone to cause trouble for L2 learners.

Figure 3: A vowel diagram with approximate values for BE monophthongs.

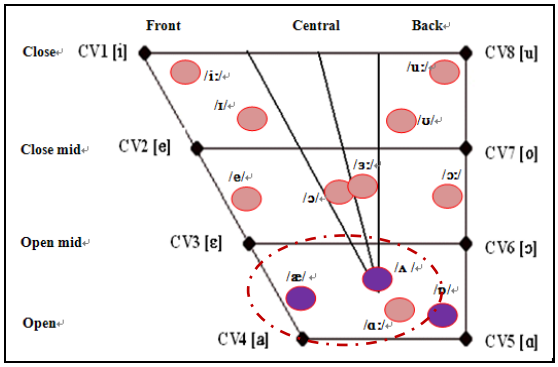
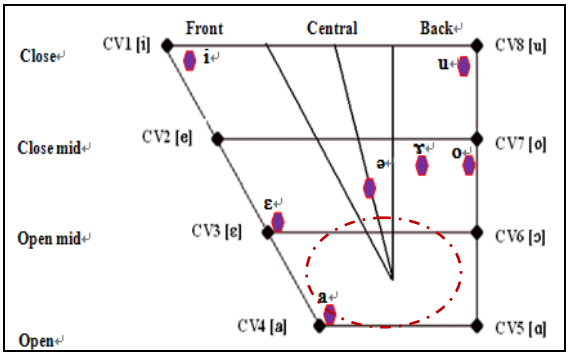


Figure 4: A vowel diagram with approximate values for Mandarin monophthongs.



4. CONCLUSIONS

The experiment reported here has demonstrated that native speakers of Mandarin can largely perceive English monophthings well with the average ratio of 81.2% correct perception of all the 12 simple vowels, and their perception is quite affected by the phonetic contexts in which the vowels occur in the carrier words. Subjects' competent perception of long vowels supports the facilitative power of equivalence in Mandarine in leaning of L2 vowel, whereas their great difficulties in perceiving low and mid-low short vowels demonstrates the considerable role of L1 interference, therefore calling for explicit instruction based on contrastive analysis and more training in the perception and production of these vowels in EFL learning and teaching.

5. NOTES

[1] The 8 multiple choices were the 8 phonetic descriptions for one recorded carrier word, which differed from each other only in one vowel segment and their phnetic contexts are identical. For example, when the target vowel was /iː/ in the

uttered carrier word ***eat***, the 8 choices are: A./ɪt/, B./iːt/, C./æt/, D./ɪət/, E./aɪt/, F./eɪt/,G. /et/, H./ɔːɪt/.

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