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The Effect of English Teaching on the Acquisition of English Vowel System: The Case of Chinese Learners of English from Zhejiang Province in China

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Abstract: As an important part of the phonological system, vowel pronunciation receives a lot of attention. Teaching and learning are important parts of a person's English vowel system. It is therefore necessary to examine the current state of students' vowel knowledge and skills and the current state of vowel teaching in order to better guide the teaching of English. This paper focuses on the impact of English language teaching on the English vowel system, using Zhejiang, China as an example. The research study included the collection of pronunciation data from respondents and a linguistic background survey in the form of a questionnaire. Based on the results, it specifically explored the vowel pronunciation of different subgroups (English majors and non-English majors, native speakers and respondents) and the pedagogical causes of the formation of pronunciation characteristics. It has been found that systematic phonics instruction does help students to pronounce vowels correctly, and that instruction does mitigate factors such as negative native language transfer, helping students to develop a vowel system that is closer to that of their native speakers.

Keywords: Teaching, English Vowel System, Chinese Learners, Zhejiang Province

1. Introduction

In recent years, several researchers have conducted several experiments from multiple perspectives to explore the issue of phonological segmental acquisition of English learners, especially vowel acquisition. The themes of the studies relate to the relationship between phonological perception and output, and the perception and acquisition of vowels (front vowels, unit vowels, loose vowels, etc.)[1-9]. However, there are still fewer studies on the vowel systems of students in specific geographical areas. Based on these findings, this paper wants to explore the following questions:

A. The impact of English teaching on the pronunciation of English vowels and whether it has a positive impact;

B. What common pronunciation difficulties do Zhejiang students have;

C. What is the way to improve these pronunciation difficulties.

This paper looks at the current state of vowel learning and the vowel system of local students in Zhejiang. Using questionnaires and audio recordings of specified texts, six university students of Zhejiang origin were involved in the survey; pronunciation was analysed through a cross-sectional comparison of English majors and non-English majors, native speakers and respondents. The paper

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identifies common features of pronunciation among different populations, also identifies some of the causes and effects on teaching through the features, and discusses the room for improvement in the teaching of vowels. Based on this study, this paper hopes to summarize some of the vowel pronunciation characteristics of Zhejiang students, as well as some of the causes of teaching, and to give some inspiration and insight to Zhejiang teachers in teaching phonetics.

2. Methods for Mapping the Vowel System

2.1. Participants

The project took place at Zhejiang University of Technology, where the author is a student. All the participants grew up with a background in Zhejiang. They were divided into two groups, group A, all English majors, and group B, all non-English majors studying science subjects, one female and two males in each group, all participants were 21 years old.

2.2. Data Collection

Table 1: Wordlist for Respondents.

									Number of contrasting vowels
A	bit	beet	beat	bet	late	bat	write	right	
B	boat	pot	bout	boot	put	cut			
C	cot	caught	court	pour	poor	paw	horse	hoarse	
D	path	maths	moth	father	lather	Sam	psalm	salmon	
E	boot	soot	cut	put	room	book			
F	won	one	swan						
G	cart	heard	Bert	curt					
H	curd	bird	word	heard	beard				
I	tire	tar	tower						
J	feed	feared	fade	fared					
K	balm	bomb	drama	comma					
L	fear	year	ear	fur					
M	carry	starry	sorry	Mary	merry	marry	hurry	furry	
N	fair	fur	per	fir	four	for			
O	not	salt	colt	moult	fault	nought	calm	column	
P	tell	tale	Al	tile	foul				
Q	doll	pole	fall	pull	pool	Roland	roller		
R	tide	tied	die	dye					
S	paws	pause	pours	bored	board				
T	wait	weight	late	height	right	bite			
U	no	know	tow	toe	threw	through			
V	made	maid	played	play					
W	rode	road	rowed	throne	thrown				
X	brood	brewed	brew	greed	agreed				
Y	Rosie’s	Rose’s	Rosa’s	posers					

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Respondents were first questioned about their linguistic background in the English vowel system. In addition to the usual collection of basic information, their language background was investigated to some extent and they were asked questions such as:

"Please enter in turn your mother tongue and any other languages you have learned or mastered and enter the total number of years you have used each language.[10]"

"Have you ever lived or traveled for more than 3 months or more in a country other than your current country of residence or birth?[10]"

In addition, they also assessed their vowel pronunciation, answering where they had difficulties with pronunciation and how teaching had affected their vowel pronunciation. For example:

"Please rate your phonetic learning skills. That is, how well do you learn the pronunciation of a new language and your ability to imitate it compared to your friends or others?[10]"

"Please indicate any pronunciation difficulties you encounter in vowel pronunciation."

"Please assess the impact of teaching on the pronunciation of English vowels."

All questions were asked in the form of fill-in-the-blank, multiple choice and scales to obtain as comprehensive a picture as possible of the respondents' linguistic and pedagogical backgrounds.

In addition to the questionnaire, respondents are given a wordlist, as shown in Table 1. Rows A through X illustrate stressed vowels. Row Y illustrates unstressed vowels. The respondents were asked to familiarize themselves with the phonetic symbols of the words but were asked not to listen to a recording of the words in Standard British English(SBE) or General American(GA) in advance. Respondents were asked to read each line of words from A to Y in turn and to record the words in a quiet environment. In addition, when a particular word contains more than one vowel-sound, respondents were required to focus on the sound associated with the underlined letter(s).

2.3. Data Analysis

The number of different vowel sounds in each line of the subject's vocabulary will be recorded. The recording follows the method of checking how many words in each line are homophones (sound the same) or rhymes, and follows the principle that English spelling does not provide comparisons between vowels.

The creator of wordlist also provides the number of different vowels per row under the standard accent. We have chosen SBE as a reference, and in the case of some rows showing accent variation we have taken a smaller number to satisfy the general requirement.

The aggregated data are then calculated as absolute values (equation (1)) and as the sum of absolute values (equation (2)). After comparing the data, we can see that the larger the absolute value of the data, the less standard the respondent's pronunciation; the smaller the absolute value of the data, the more standard the respondent's pronunciation. There was a negative correlation between the absolute value of the data and the respondents' pronunciation standard.

$$\Delta\text{Somebody} = |\text{SBE}_{\text{Line}} - \text{Somebody}_{\text{Line}}| \tag{1}$$

$$\text{Sum}_{\text{error}_{\text{Somebody}}} = \sum_{\text{Line=A}}^{\text{Y}} \Delta\text{Somebody}_{\text{Line}} \tag{2}$$

3. Results

Based on each respondents' wordlist recording file, after counting the number of different vowels per line and calculating the absolute value, the data for all respondents are shown in Table 2.

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Table 2: Respondents' Vowel Pronunciation Table.

Test Number		01	Δ 01	02	Δ 02	03	Δ 03	04	Δ 04	05	Δ 05	06	Δ 06
Line	SBE												
A	6	5	1	5	1	4	2	6	0	5	1	5	1
B	6	4	2	6	0	6	0	5	1	5	1	6	0
C	2	5	3	5	3	5	3	6	4	6	4	5	3
D	3	4	1	4	1	3	0	4	1	5	2	4	1
E	3	3	0	4	1	3	0	3	0	2	1	3	0
F	2	1	1	1	1	2	0	2	0	2	0	2	0
G	2	2	0	3	1	2	0	2	0	2	0	2	0
H	2	1	1	3	1	2	0	4	2	2	0	3	1
I	3	3	0	3	0	3	0	2	1	3	0	3	0
J	4	3	1	4	0	4	0	4	0	3	1	4	0
K	2	3	1	4	2	4	2	4	2	3	1	3	1
L	2	2	0	2	0	2	0	2	0	2	0	2	0
M	7	3	4	4	3	6	1	5	2	5	2	5	2
N	3	3	0	4	1	6	3	4	1	4	1	3	0
O	4	4	0	5	1	6	2	4	0	5	1	5	1
P	5	5	0	4	1	5	0	3	2	4	1	5	0
Q	6OR5	3	2	5	0	4	1	4	1	6	0	5	0
R	1	1	0	2	1	1	0	1	0	1	0	1	0
S	1	3	2	2	1	3	2	4	3	2	1	2	1
T	2	2	0	2	0	2	0	2	0	2	0	2	0
U	2	3	1	3	1	3	1	4	2	2	0	2	0
V	1	1	0	2	1	1	0	1	0	1	0	1	0
W	1	2	1	2	1	2	1	2	1	1	0	3	2
X	2	2	0	2	0	2	0	2	0	2	0	3	1
Y	2	3	1	3	1	4	2	3	1	2	0	3	1
Sum_error		22		23		20		24		17		15	

3.1. Comparison of Pronunciation between Native English Speakers and Respondents

The results of the data show that all respondents were standard and error-free in the pronunciation of vowels in rows L and T. It is evident that the pronunciation and differentiation of the diphthong [iə] and the monophthong [ə:] as well as the pronunciation and differentiation between the diphthongs [ei] and [ai] are relatively easy for Zhejiang students. In the pronunciation of the words in rows G, I, R, V, X, the overall performance was almost perfect, although some respondents had a few inaccuracies, and it was evident that pronunciation and differentiation of [ɑ:] and [ə:], [ai][ɑ:] and [au], [ai], [ei], [u:] and [i:] were not difficult for students in Zhejiang Province.

However, in the case of rows C and M, the respondents showed a difference from native speakers in that non-native speakers both "derive" and "merge" vowels when pronouncing words. In the case of row C, for example, only two vowels can be distinguished in this line of words according to the SBE standard, but the respondents can pronounce five or even six vowels that are recognizable to the ear. This gives rise to a number of variants of the original monophthong [ɔ:] due to curling and other factors, thus giving rise to "derivational" behaviour. The "merging" behaviour is clearly visible in row M. Under the SBE standard, seven vowels could be distinguished in the M-row words, but none of the respondents were able to do so accurately, instead "merging" many

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similar sounds, for example, pronouncing the [æ] sound in "Mary" as the [e] in "merry", so that's why the number of vowels that could be distinguished in respondents' recordings was much smaller than the SBE standard.

3.2. Comparison of Pronunciation between English and Non-English Majors among Respondents

In 2.1, we divided the respondents into two groups: English majors and non-English majors. We found that the sum of the absolute values of the "errors" for group A (English majors) was 20, 17 and 15 (respectively), while for group B (non-English majors) it was 22, 23 and 24 (respectively). Not only was the average number of individuals in Group A (17.3) smaller than in Group B (23), but each individual in the entire Group A was smaller than each individual in Group B.

Group A also performed better in terms of detail, with respondents generally under-performing on the seven vowels [æ], [ɑ:], [ɒ], [eə], [e], [ʌ], [ɜ:] in the M-row distinctions described in 3.1, but with an absolute value of ≤1 error per individual in Group A, while Group B had an average error of 3 in the M-row.

4. Reasons for Differences between the Groups

In conjunction with the questionnaire, we tried to explore the pedagogical factors associated with the differences that emerged between native speakers and respondents as well as between English majors and non-English majors.

In the comparison between native speakers and respondents, we found that pronunciation "errors" were largely due to the negative transfer of the respondents' native language (Zhejiang dialect), and that Zhejiang students rarely received any phonetic correction from their teachers in the English classroom. For example, [ʌ] and [ɑ:]. Due to the influence of the "ā" in the dialect "ā yí" (which means aunt in English), students are confused about how to place the tongue and how wide the opening is when pronouncing [ʌ] and [ɑ:], and often end up pronouncing them as the Chinese "ā". They then confuse words such as 'cut' and 'cart', 'luck' and 'lark " and "hut" and "heart". However, if the teacher teaches concepts such as tongue position and visualizes them in pictures, students will recognize that when pronouncing [ʌ], the back of the tongue is raised slightly against the lower teeth on both sides, the lips are flat, the tongue position is slightly higher than [æ] and the tongue position and opening is slightly less than [e]; when pronouncing [ɑ:], the tip of the tongue is not against the lower teeth and the tongue body is flat and retracted and raised[11]. This will help students to recognize exactly in what way they pronounce words and reduce the impact of negative transfer from their mother tongue.

In a comparison between English majors and non-English majors, we found that systematic phonics classes and speaking lessons taught by native English speakers worked well to help English majors excel in vowel pronunciation. 83.3% of the respondents agreed that teaching has a high or very high impact on the pronunciation of vowels in English, and they expressed different expectations in the question "What else can teaching do to help students learn the vowel system?" But whether it is as straightforward as "offering specialist courses" and "providing opportunities for communication", or as specific as "studying pictures of the oral vocal apparatus" and "talking about the evolution of pronunciation", some efforts and innovations can be made in teaching.

5. Conclusion

In order to investigate the impact of English language teaching on the English vowel system, this paper focuses on students in Zhejiang, China. This paper found that teaching can be used not only

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to reduce the effects of negative transfer from the mother tongue but also to compensate for the deficiencies in vowel pronunciation that have developed.

However, the scope of this research study was small, with only six people in total, and the respondents were all from one school and all aged 21, which was lacking in scope and age universality; some words were mispronounced due to the respondents' lack of preparation and nervousness, and the vowels appearing in the recordings were only judged by the naked ear, which lacked scientificity in the method of operation. It is hoped that this paper will serve as an inspiration for more rigorous and scientific research using sound analysis software for a wider age range of respondents in the future.

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