



Pronunciation Variation of /r/ in the Accented English of Chinese Learners

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Abstract. With more Chinese people choosing English as their second language, pronunciation errors garner increasing interest, particularly among ESL researchers. Taking certain words and sentences as martial, this paper aims to discover the pronunciation pattern when Chinese learners try to pronounce the phoneme /r/ in different English environments and to compare the pattern with Standard British English (SBE) and General American English (GAE). Participants are chosen from both the northern and southern parts of China, and Praat is used to analyze the recording. It is found that all of the participants tend to have differences when pronouncing word groups that involve the phonological distribution of /r/, and most of the patterns tend to like GAE, which is the most popular target accent teaching at school. The result of this paper can help language teachers be more specific when teaching students who target different English accents to learn the pronunciation phenomenon of /r/.

Keywords: Second language learning; /r/ phoneme; TESOL; accent; phonology

1 Introduction

As an increasing number of Chinese people choose English as their second language, the pronunciation phenomenon caused more and more interest, especially in the common error each Chinese learner may cause when they try to master English as their second language. Through all the phenomena that are worth researching, /r/, as a particular phoneme, plays a very important role. Since /r/ already varies within different English accents, and also appears differently from the southern part of China to the northern part of China, which causes both rhotic and non-rhotic accents, it is important to analyze /r/ in the accented English of Chinese learners, and the result will help teachers to improve their teaching skills.

In Chinese, /r/ is a fricative, there is a phenomenon called ‘érhuà’, which means to put an /r/ at the end of some words, otherwise, /r/ only appears at the front of a syllable. Furthermore, in Chinese, ‘érhuà’ represents most of the northern accents in China [1], while the southern part of China usually does not use this skill. That is to say, even though they both speak Mandarin, influenced by their accent, the northern part of China tends to be rhotic, while the southern part of China tends to be non-rhotic.

In English, /r/ is an approximant, compared Standard British English (SBE) with General American English (GAE), it is notable that SBE is a non-rhotic accent, while GAE is a rhotic accent. What's more, in English, /r/ has different relative variations, such as linking /r/, which happens when a non-rhotic accent pronounced /r/ at the end of a word; 'Intrusive' /r/, that is to put a /r/ between two words where there is no /r/. Originally, both of these two phenomenon helps to link the syllable or to link between one word and another.

2 Literature Review

2.1 Previous Research

In the study of second language acquisition, it is proved that L2 learners tend to imitate the L2 phonemes based on their L1 phoneme category [2-3], as for learning English as a second language, there are researches focused on one language systematically and researches focused on specific phonemes.

For research that focused on one language systematically, Sha & Robert pointed out the importance of phonological decoding, and by focusing on Chinese people's English learning, they proved that phonics instruction can have a positive impact on second language learners' abilities [4], which shed light on ESL teacher's teaching methods; Han focused specificity on Chinese learner's English pronunciation problem, and analyzed the problem of vowels, consonants, phonotactic, suprasegmental and rhythm, and then provide measures for teachers [5]; Li & Jia used participants from Beijing(north region of China) and Changsha(south region of China) to examines how learners of English as a Foreign Language from different regions in China acquire the retroflex vowel [ɜ:], and the experiment supports that pronunciation differences are influenced by dialectal background and gender [6]. Dai & Wen focused on Chinese children's English learning, and pointed out that the child's early errors in English learning is caused by a mechanism of "entrenchment, mingling, and associate entrenchment" [7].

For researches that focused on specific phonemes, Radwanska-Williams & Yam take plosives at the end of the syllable, which are /b/, /p/, /d/, /t/, /k/, and /g/ in English, and to examine the phenomenon in learners whose mother tongue is Mandarin or Cantonese [8]; Gradoville et al. focused on /s/ and /h/ in Spanish, examines the acoustic characteristics of Spanish /s/ variants and proposes a combination of measurements to represent the observed variation [9]; Garita et al focused on non-native speaker's English vowel sound pronunciation [10].

What's more, some researches provide experimental methods, most of the experiments is about asking the participants to read the material, and then transcript the result into data, or analyze the recording using Praat or SPSS, etc, for example, Boyce uses MRI to distinguish tongue movements required for correct pronunciation, and then give advise for children's residual speech errors [11].

To sum up, even though some papers discuss certain phonemes, most of the papers focus on the language level, do not focus on certain phonemes and are not enough

detailed to focus on different situations. Hence, this paper focuses on /r/ alone and pays much attention to the different environments of /r/.

2.2 Question

There are two main questions in this paper, and the paper aims to answer these questions and to shed light on second language teacher's teaching methods.

The first question is about the patterns: Will Chinese learners show a chaotic or different result when they pronounce the phoneme /r/ in different situations, and is the hypothesis suggesting that there are potential patterns among different populations?

The second question is about the speaker's original accent and the target foreign accent they learn: whether north participants tend to be rhotic while south participants tend to be non-rhotic, or are they mostly influenced by the target accent they try to learn?

2.3 Assumption

This paper specifically focuses on /r/ as a phoneme, analyzes different situations where it appeared in a word or a sentence, and finds out what pattern Chinese learners may show when they learn English as their second language.

The assumption is that even though compared with SBE and GAE, Chinese learners may show a chaotic result when pronouncing /r/ in different situations, it will still show a certain pattern with each situation. Their original Chinese accent may influence their pronunciation in English, causing that the northern part of China tends to be rhotic, while the southern part of China tends to be non-rhotic. However, due to the educational influence, the result might be different.

Hopefully, the result of this paper may help TESOL teachers to adjust and be more specific on different target accents, such as SBE and GAE.

3 Research Design

Experiments were used during the research, in which six Chinese native speakers aged 16 to 22, three from the southern part of China and three from the northern part of China, chose to participate in this study. The members from the south part of China are chosen from Hunan Province, and the members from the north part of China are chosen from Shandong Province. Both provinces speak Mandarin as their official language. Hunan Province has a typical south accent, mostly non-rhotic, while Shandong Province has a typical north accent, mostly rhotic. Both participants are educated within China mainland and are qualified to speak standard Mandarin.

The materials used in the experiment are words and sentences. The words are divided into different groups based on the place where /r/ appeared, for the sentences, they show /r/ between two words, and the two words are planted inside each sentence, they are also divided into groups based on /r/'s position and the relationship between the two words. All these groups will be mixed when sending to the participants.

The measurements used in the experiment are recordings and the software Praat. The procedure is that participants are given a structure that shows them the martial, with the Chinese sentences showing instruction, and are asked to record their voice when reading the martial. After selecting all the recordings, Praat will be used to analyze the voice track and identify each participant's pronunciation in each group, and compare the result with SBE and GAE. Praat's analyses will be shown as spectrogram, which will show the difference between rhotic and non-rhotic accents by showing differences from F3, in rhotic accent, it can be observed that F3 significantly dropped when the pronunciation /r/ in the rhotic accent, while in the non-rhotic accent, F3 will remain steady. So it will be easy to divide those accents through Praat.

4 Results

The results are shown in Table 1 below, the first row represents GAE, which is a rhotic accent, and the second row represents SBE, which is a non-rhotic accent. NP represents participants who are from the northern part of China, and SP represents participants who are from the southern part of China, following NP or SP, is the participant's test number.

Table 1. Original word list from John Harris.

	Word list	R(GAE)	NR(SBE)	NP1	NP2	NP3	SP1	SP2	SP3
1	red, rude	r	r	r	r	r	r	r	r
2	around, terrain	r	r	r	r	r	r	r	r
3	neurone, thyroid	r	r	r	r	r	r	r	r
4	very, parent	r	r	r	r	r	r	r	r
5	different, natural	r	r	r	r	r	r	r	r
6	poor again, after a before eight, poor	r	r	r	r	r	∅	r	r/∅
7	Alice	r	r	r	r	r	∅	r	r
8	sofa and, idea of	∅	r	∅	∅	r	∅	r	∅
9	board, farm	r	∅	r	r	r	∅	r	r
10	bear to, before nine	r	∅	r/∅	r	r	∅	r	r
11	bear, car	r	∅	r	r	r	∅	r	r
12	keyring, playroom	r	r	r	r	r	r	r	r

In Table1, NP1, NP3 and SP3 are males, and NP2, SP1, SP2 are females.

As shown in Table 1, the words are divided into twelve groups, each with a different environment. For the first to fifth group, it shows the different positions of /r/ within one word. For example, in the first group, /r/ appears at the onset of a syllable, and in the word's initial; For groups six, seven, eight, and ten, it shows the different environments the /r/ might be within more than one word, while group nine and eleven focus on the /r/ at the end of the word. For example, in the eighth group, there is no /r/ in the word, but since there are two vowels at the first word's end and next word's start,

and the vowel on the left is non-high, to link the two words, linking /r/ might appear, and in the ninth group, /r/ appears in a syllable's coda, and is before consonant. What's more, for the twelfth group, /r/ appears in the same position group three shows, but the words are compounds.

It is clear that each of the participants shows a slightly different system when pronouncing /r/ in different environments, yet they still have something in common. All of the participants make no difference when pronouncing group one to five, group nine, group eleven, and twelve, which also are the same GAE or SBE like. However, in groups six, seven, eight, and ten, there appears to be some chaotic pattern.

As for participants from north part of China, NP1 appears to be rhotic, apart from the groups that all of the participants managed to pronounce the same, NP1 has a different pronunciation in group ten, which in GAE /r/ will be pronounced, NP1 swift between pronouncing /r/ and not pronouncing /r/; NP2's pronunciation is the same compare with GAE; NP3 appears to be rhotic, and pronounced all the group with /r/, NP3 pronounced group eight with /r/, while GAE pronounced group eight without /r/.

As for participants from the southern part of China, SP1 appears to be non-rhotic, and in groups six, seven, and eight, SP1's pronunciation appeared without /r/, while SBE appeared to have /r/; SP2's pronunciation is the same as NP2; SP3 appeared to be rhotic, and have a difference in group six. Compared with GAE, SP3 shifted between pronouncing /r/ and not pronouncing it.

5 Discussion

Based on the results above, most of both north and south participants tend to be rhotic, while only one participant from the south appeared to be non-rhotic, and there are no significant different patterns between north and south participants. The reason for this phenomenon might be education. China's education system takes English as a main course in its "nine-year compulsory education", and during this period, most of the schools chose the American accent or GAE as the student's target accent. The participants who attended this experiment all studied through the whole pried, and long terms of study and repeat might weaken the influence of their original accent [7].

Furthermore, the results showed that different participant's accents varied in groups six, seven, eight, and ten, which are all groups that contain more than one word. Some examples of the participants will be given to clarify the point.

For group six, as shown in Figure 1 and Figure 2, NP2 and SP1 are chosen to give an example of their pronunciation difference: NP2 pronounced /r/ in group six, while SP1 didn't pronounce /r/ in the same group, as Praat showed, it is clear that F3 dropped in NP2's voice when pronouncing "poor", while in SP1's voice, F0, F1, F2, and F3 are all approximately flat.

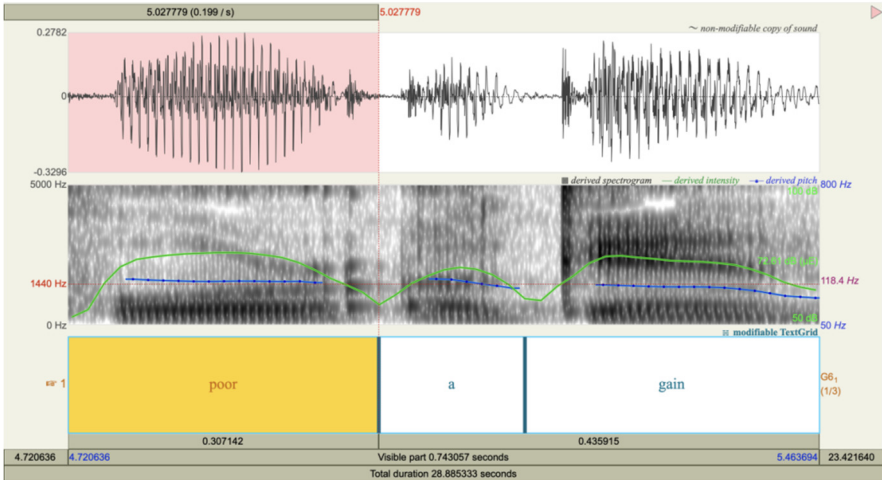


Fig. 1. NP2's Group 6: with /r/.

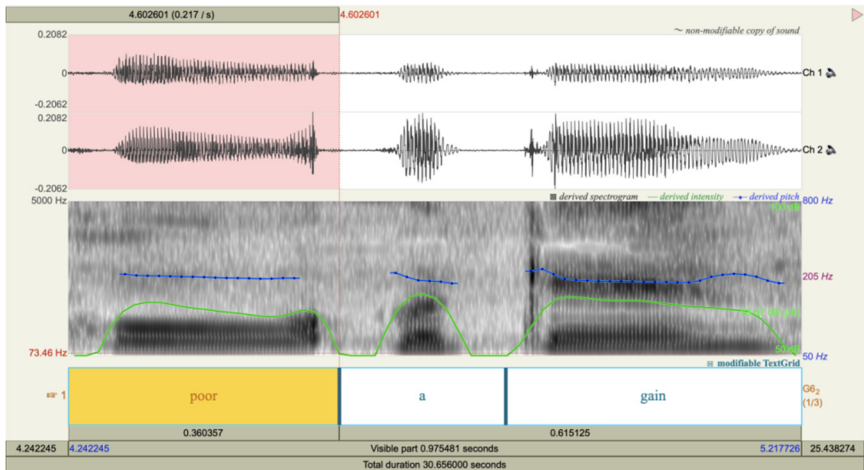


Fig. 2. SP1's Group 6: without /r/.

Hence, Praat can help to distinguish the difference where /r/ is pronounced or not, and all the experiment martial are analyzed by Praat to get the final result. As the results showed, it is possible to answer the questions that are given at the start of this paper.

For the first question, Chinese learner indeed shows a rather chaotic pattern when pronouncing /r/ in different situations, nevertheless, this phenomenon only happens in the group that contains more than one word, and the participants have no difference in pronouncing all the single word group, despite /r/'s position and situation, so there is this pattern of switch between pronouncing /r/ and dropping /r/ when facing the situation with more than one word.

For the second question, as discussed above, it is showed that only one south participant is non-rhotic, and the rest of the participants are all rhotic, which illustrates that during the long-term education, the participant's target accent proved to be of more influence than the participant's original accent.

And to answer the assumptions mentioned above, there are certain patterns in the participant's pronunciation, which is that they can easily pronounce a single word, but struggle to pronounce the word groups. And it is shown that the southern part of China shows slightly more tension to be non-rhotic compared to the northern part, however, as the result shows, both south and northern participants are mostly rhotic, which is related to English education in China, which mostly tend to teach students to be rhotic.

6 Conclusion

To sum up, the experiment took six participants who are well-educated in China mainland, three from Shandong Province which is located in the northern part of China, and three from Hunan Province, which is located in the southern part of China. With Mandarin as their mother tongue, the participants all learn English as their second language and have a moderate level of English proficiency.

The experiment is to ask the participants to read a few sentences and words that contain /r/ in different environments while not letting them know the aim of the test, then collect the recordings and analyze them in Praat, and finally compare them with SBE and GAE.

The result of the experiment shows that most both north and south participants tend to be rhotic. All the participants pronounced single words the same as SBE and GAE, however, when facing word groups that contained more than one word, the pronunciation became a little bit chaotic, which can be caused by different pronunciation habits between Chinese and English.

Possible limitations of the paper are as follows: First, since the experiment only chose two provinces to analyze, there may not be so much of a difference in learning environment influence. Second, due to budget and time limits, the experiment only chooses six participants to analyze, hence, the sample population numbers are not big enough, and there are no quantified standards to test the participants' English and Mandarin proficiency.

The paper's future implication is to help TESOL teachers on teach different kinds of /r/ and how to help different students with different target accents learn and pronounce /r/ in English. What's more, for certain knowledge, for example, the /r/ between two words in a certain environment, this paper gives them a reference on whether they need to be illustrated.

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