An Analysis of Nasal Production of Chinese Learners of English in Wu Chinese Dialect Area

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ABSTRACT
With the generalization of Mandarin and English among a younger age in Wu Chinese dialect area, fewer teenagers can speak Wu Chinese dialect. However, dialect still has an influence on teenagers' pronunciation when they speak mandarin. Thus, it can be seen that the dialect can also have an influence on English learning. This paper mainly analyzes the nasal production of Chinese learners of English in the Wu Chinese dialect area. It includes a related study that investigated different learners' nasal production. The results showed that dialect has strongly affected Wu Chinese learners of English in their area, including phoneme alternation and Codas deletion or omission.

Keywords: *Nasal, Wu Chinese dialect, learners of English, nasal production, coda.*

1. INTRODUCTION

In recent years, with the implementation of the promotion policy of Mandarin by the government, especially the popularization of Mandarin in schools, and the acceleration of urbanization and population flow in China, the promotion of Mandarin has achieved remarkable results [1]. According to Yu's research, in Suzhou, a city in the Wu Chinese dialect area, a total of 45.7% of the students acquired Mandarin before they went to primary school, indicating that Mandarin occupies a place in the field of first language acquisition. However, the influence of mother language is deep-rooted. Although many children speak mandarin as their first language, their accent has still been influenced by dialect, because the first language a person is exposed to and acquired as a child is usually acquired from his parents and most of the parents speak a dialect. Similarly, when children started to learn English, the pronunciation can also be influenced by the dialect even they don't speak dialect at all.

In this study, the author examined nasal production of Chinese learners of English in Wu Chinese dialect area and considered the following questions:

In the Wu Chinese dialect area, what is the overall acquisition of English nasals /m/, /n/, /ŋ/ by Chinese learners?

Is there any relationship between the nasal pronunciation in Wu Chinese and English by Chinese learners of English in the Wu Chinese dialect area? Can the nasal production in English be influenced by their first dialect?

Is there any changes of nasal production among students of different ages?

These questions remain partly unanswered in previous literature. Therefore, the results of this present study might draw the teachers and linguists' attention to the acquisition of nasal production of Chinese learners of English in the Wu Chinese dialect area.

This study consists analysis of the Chinese learners in Wu Chinese dialect area from SELL-CORPU. These data are used to compare the duration and formants of /m/, /n/, and /ŋ/ with that of native English speakers.

2. LITERATURE REVIEW

2.1. The influence of dialects on English

According to the 2021 General introduction of the Chinese language by the Ministry of Education [2], Chinese dialects are usually divided into ten dialects: Mandarin dialect, Jin dialect, Wu dialect, Hui dialect, Min dialect, Guangdong dialect, Hakka dialect, Gan dialect, Xiang dialect, Pinghua and tuhua. Therefore,

dialects in different regions have different effects on the pronunciation of English learners.

For example, for most people in the Three Gorges reservoir area where they speak southwest mandarin, it is difficult to distinguish the phoneme /h/ and /f/ [3]. In English, /h/ is a glottal consonant sound. When pronouncing /h/, the air flows freely out of the mouth, causing only slight friction through the glottis, the vocal cords do not vibrate. While /f/ is a labiodental consonant, which requires the lower lip to touch the upper teeth and the air flows through the gap between the lips and teeth. /h/ is aspirated, but the vocal cords do not vibrate. As a result, /f/ is much easier to pronounce compared to /f/. This irregular pronunciation causes Chinese learners of English mingling the two sounds when they pronounce them. Most of them tend to pronounce 'fashion' incorrectly as /ˈhæʃən/ and 'family' as /ˈhæməli/. Meanwhile, because the pronunciation of /f/ and /v/ need to touch the lower lip on the upper teeth, and [v] is a voiced consonant. The vocal cords vibrate when articulating. Therefore people mix /h/, /v/ as well as /h/,/f/. When learning English, most people don't pronounce /fæn/('fan') as /hæn/, but /væn/. Although there is no /v/ in Chinese, the indirect influence of dialect causes many people tend to pronounce 'leave' as 'leaf' and 'save' as 'safe'. This brought a great negative impact on Chinese learners of English in the Three Gorges reservoir area.

Cantonese is another dialect that is widely spoken in Guangdong province. However, there is no cacuminal /r/ in Cantonese pronunciation. /r/ is a rhotic consonant in English, when /r/ is pronounced, the tip of the tongue is rolled up behind the gingival, the tongue does not touch any part, the lips are slightly rounded, and the vocal cords vibrate [4]. However, as there is no rhotic sound in Cantonese, the Cantonese pronunciation of /R/ often raises the tip of the tongue and then retracts, forming an obstruction with the back gingival and being misinterpreted as lateral liquid [l]. For example, the correct pronunciation of the word 'reducing' should be /rɪˈdjuːsɪŋ/ but people in Cantonese spoken area would pronounce /lɪˈdjuːsɪŋ/.

2.2. Features of Wu Chinese dialect

Like other dialects, Wu Chinese dialect has many unique features. Here takes the Suzhou dialect for example. In Suzhou dialect, the ancient consonant is completely preserved, blade-alveolar sound and retroflex sound are not divided [5], the '-n' part of the final rhyme falls off and the most marked feature, velar nasal and alveolar nasal are nit distinguished.

To clarify the influence of Wu Chinese dialect on Chinese learners of English, this research will conduct and improve the study 'Nasal sound acquisition of Chinese learners of English in Jianghuai mandarin area' of Dai's [6].

3. THE RESEARCH PROCESS

3.1. Methods

3.1.1. Participants

10 Chinese learners in Wu Chinese dialect area from SELL-CORPUS.

3.1.2. Materials

In this experiment, the phonetic material design is based on the output examination of three target nasals on the subjects, and the subjects are required to read the three target nasals in the onset, nucleus and coda one by one. The speech analysis software Praat is used for the output. The reading materials are shown in Table 1.

Table 1: Word List

Nasal	tokens		
	onset	nucleus	coda
m	me		from
n	no	and	in
ŋ		think	being

For example: "IT WAS VERY QUIET IN THE ROOM FOR A MOMENT I HEARD NOTHING BUT THE TICKING OF A SMALL SILVER CLOCK ON THE WRITING TABLE".

3.1.3. Procedure

The output was analyzed by the speech analysis software Praat. Praat was used to annotate the nasal section in the production, and to take 5 equidistant timepoints in a segment. The third timepoint is selected as the research comparison object. The last step is to calculate the maximum, minimum and the mean of frequency, amplitude and bandwidth of the three formants at the third timepoint. For example, the words including nasal pronunciation are: Room, moment, small, in, nothing, on, ticking, writing.

3.2. Results

At the first formant of the alveolar nasal, the maximum frequency is 1938, the minimum frequency is 94 and the mean is 276.25. In velar nasal, the maximum frequency is 2469, the minimum frequency is 94 and the mean is 322.30. At the second formant of the alveolar nasal, the maximum frequency is 2573, the minimum frequency is 615 and the mean is 1600.31. In velar nasal, the maximum frequency is 3391, the minimum frequency is 810 and the mean is 1691.14. At the third formant of the alveolar nasal, the maximum frequency is 4305, the minimum frequency is 1668 and the mean is 2605.50. In

velar nasal, the maximum frequency is 4442, the minimum frequency is 1845 and the mean is 2616.95.

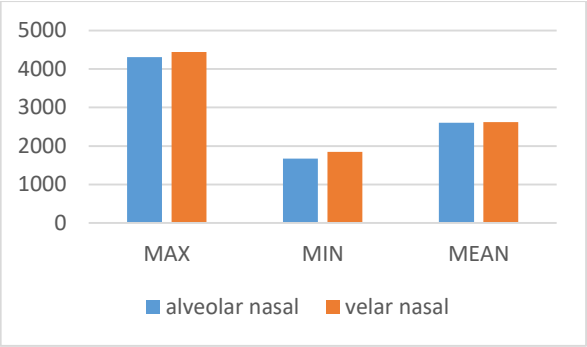

Figure 1: freq_f3

At the first formant of the alveolar nasal, the maximum amplitude is 55.4, the minimum amplitude is -4.51 and the mean is 43.62. In velar nasal, the maximum amplitude is 54.38, the minimum amplitude is 0.66 and the mean is 43.99. At the second formant of the alveolar nasal, the maximum amplitude is 43.26, the minimum amplitude is -6.6 and the mean is 13.62. In velar nasal, the maximum amplitude is 36.24, the minimum amplitude is -12.68 and the mean is 11.85. At the third formant of the alveolar nasal, the maximum amplitude is 33.79, the minimum amplitude is -13.81 and the mean is 9.60. In velar nasal, the maximum amplitude is 29.44, the minimum amplitude is -7.35 and the mean is 8.69.

At the first formant of the alveolar nasal, the maximum bandwidth is 3411, the minimum bandwidth is 4 and the mean is 209.14. In velar nasal, the maximum bandwidth is 3047, the minimum bandwidth is 4 and the mean is 191.86. At the second formant of the alveolar nasal, the maximum bandwidth is 5858, the minimum bandwidth is 13 and the mean is 672.19. In velar nasal, the maximum bandwidth is 5047, the minimum bandwidth is 77 and the mean is 790.31. At the third formant of alveolar nasal, the maximum bandwidth is 3223, the minimum bandwidth is 38 and the mean is 522.77. In velar nasal, the maximum bandwidth is 3698, the minimum bandwidth is 49 and the mean is 624.56.

The maximum of A1-P1 (A1 refers to first formant peak, P1 refers to extra peak) of the alveolar nasal is 59.36, the minimum is -2.89, and mean is 33.43. The maximum of vowel duration of velar nasal is 53.43, the minimum is -5.24 and the mean is 34.23. The maximum vowel duration of the alveolar nasal is 284, the minimum is 12 and mean is 103.93. The maximum of vowel duration of velar nasal is 263, the minimum is 26 and mean is 123.38.

The difference between the acoustic measurement of frequency is the most significant, and the amplitude is less obvious. The word ‘and’ is strongly pronounced with nasal sound than other words. However, in some circumstance, the ‘n’ in ‘and’ is missed. The word ‘anything’ would be easily pronounced as /'eniθɪn/.

4. DISCUSSION

This study acoustically investigated the frequency, amplitude, bandwidth and vowel duration. The question of what is the overall acquisition of English nasals /m/, /n/, /ŋ/ by Chinese learners in the Wu Chinese dialect area was explored in detail, the results showed there is a relationship between Wu Chinese dialect and learners’ English pronunciation. Some notable features are listed as followed.

4.1. Phoneme alternation

There's not much difference between the nasal sounds except for the first formant and the anti-formant frequency. As a result, there is a lot of mishearing between the nasal sounds in the presence of interference and that is why there are a lot more conversions between the nasal sounds in speech than between the corresponding bursts [7].

According to the research, there are three circumstances: One is to pronounce the alveolar and velar nasal sounds [n] and [ŋ] in English all as [n]. For example, the word ‘anything’ would be easily pronounced as /'eniθɪn/ instead of /'eniθɪŋ/ and learners pronounce /θɪŋk/ (‘think’) incorrectly as /θɪnk/. One is to pronounce the alveolar nasal sounds [n] as a velar nasal [ŋ]. For instance, many learners don’t pronounce /sʌn/ (‘sun’), but /sʌŋ/. The other is failing to distinguish alveolar nasal sounds [m] and [n]. For example, the correct pronunciation of the word ‘impossible’ should be /ɪm'pɒsəbl/, but learners would pronounce /ɪn'pɒsəbl/. Meanwhile, they also pronounce /sʌn/ (‘son’) as /sʌm/ (‘some’). According to Lai’s [8] research nasals are cross-linguistically susceptible to change, especially in the syllable final position.

4.2. Codas deletion or omission

In Wu Chinese dialect, it is not uncommon to see consonant deleting in the coda of nasal rhyme accompanied with vowel nasalization. The nasal pronunciation ‘an, en, in’ in mandarin would change into Yin-sheng rhymes, which is end up with a vowel [5].

In this study, it can be found that the [n] on the coda position was easily be lost. For example, in the words ‘run’, ‘identity’ and ‘one’, [n] was deleted, and the vowel before the ‘n’ was nasalized.

4.3. Language Transfer

It is not easy to give a simple definition to Language Transfer. In general, Language Transfer means the use of previous linguistic information in a second language context [9]. According to the general rule, the level of second language acquisition is proportional to the time of learning, and language transfer will gradually decrease

with the increase of learning time [10]. However, with the influence of dialect, it is not always true. Some of the negative transfer features did not disappear with age and learning time. In Wu Chinese dialect, many children speak mainly mandarin when they enter primary school or at home, but when they are in high school or university, they start to speak dialect gradually, a phenomenon is closer to the previous generation of language use. This increases the influence of language transfer.

5. CONCLUSION

This research answered the three questions raised at the beginning. There are mainly two problems of Wu Chinese English learners' acquisition of nasal pronunciation, phoneme alternation and codas deletion or omission because of the influence of Wu Chinese dialect. Besides, with the growing ages of learners, their acquisition of English nasal production would be either improved or deteriorated. However, in this research the author does not study statistics about English native speakers. In the future, more corpus of the native speakers can be tested and make a comparison with English learners.

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