# Yixing Dialect: Phonetics and Phonology

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| ARTICLE INFO | ABSTRACT |
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As a sub-dialect of Wu dialect, Yixing dialect shares a lot of similarities with other Wu dialects, but also has its own unique sound system and other phonological rules. This paper aims at giving the complete sound system of Yixing dialect and unfolding the phonological rules being responsible for the tone sandhi in Yixing dialect. The paper will be mainly divided into three parts: in the first part, we will focus on analyzing the phonetic features of consonants and vowels in Yixing dialect with the use of Praat, and the diagram of initials and the relative position diagram of monophthongs in Yixing dialect and Mandarin will be derived. In the second part, we will firstly look at the tone patterns in Yixing dialect and then the tone sandhi facts in it. With the help of Praat, we can see clearly how the tones are changed when a word is combined with the other. In the third part, we will focus on the distribution of labiodental fricatives [f] and [v] and also the phonological rules accounting for the distribution will be given.

## Introduction

Yixing dialect is a sub-dialect of Wu dialect, which is the second popular dialect in China, both in terms of the population of using it and the area it covers. Wu dialect is mainly heard in areas including Shanghai, southeastern part of Jiangsu province, Zhejiang province, northeastern part of Jiangxi province, northwestern part of Fujian province and northern part of Anhui province. A common feature shared by all sub-dialects of Wu dialects is "the three-level division of unaspirated voiceless obstruent initials, aspirated voiceless obstruent initials and voiced obstruent initials."(Zhao Yuanren 1956: 1)While because of inner differences in grammatical structures, Wu dialects are furtherly divided into 5 areas: Taihu Lake, Taizhou, Dong'ou, Wuzhou, Chuqu. The Yixing dialect belongs to the Taihu Lake dialect.

## The Sound System of Yixing Dialect

Yixing dialect as a sub-dialect of Wu dialect has retained a lot of ancient sounds. Compared with the sound system of Mandarin, there are quite a few differences between Yixing dialect and Mandarin. This part is supposed to analyze the existing initials and finals in Yixing dialect, and through the analysis and comparison with Mandarin, diagrams of consonants and vowels in Yixing dialect should be derived.[2]

### Consonants

*Obstruents*

Mr. Zhao Yuanren first came up with the idea that the characterized feature of Wu dialect is "the three-level division of unaspirated voiceless obstruent initials, aspirated voiceless obstruent initials and voiced obstruent

[2] In thispaper, all the sound information isrecorded by me and isconfirmed by my parents and grandmother, who are all native speakers of Yixingdialect. Sound materials are recorded and analyzed by Praat.

initials."(Zhao Yuanren 1956: 1) This feature actually is proved quite useful and significant in studying Wu dialect. So, let's talk about the plosives, fricatives and affricates respectively in the first place.

*Plosives*

In the three phrases yibang(一帮)，yipen(一喷) and yipai(一排)，there are three different initials when they are pronounced in Yixing dialect, in spite of pen( 喷) and pai( 排)have the same pinyin form. The speech pressure waveforms by Praat can show the differences more clearly.
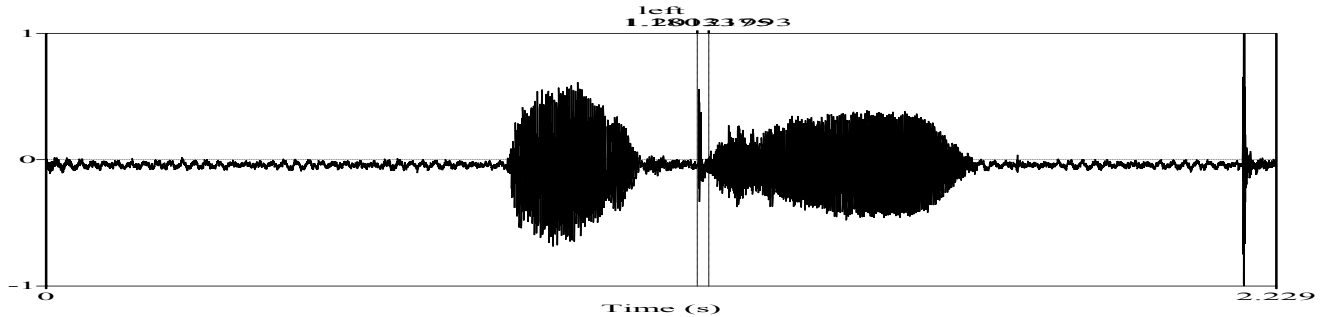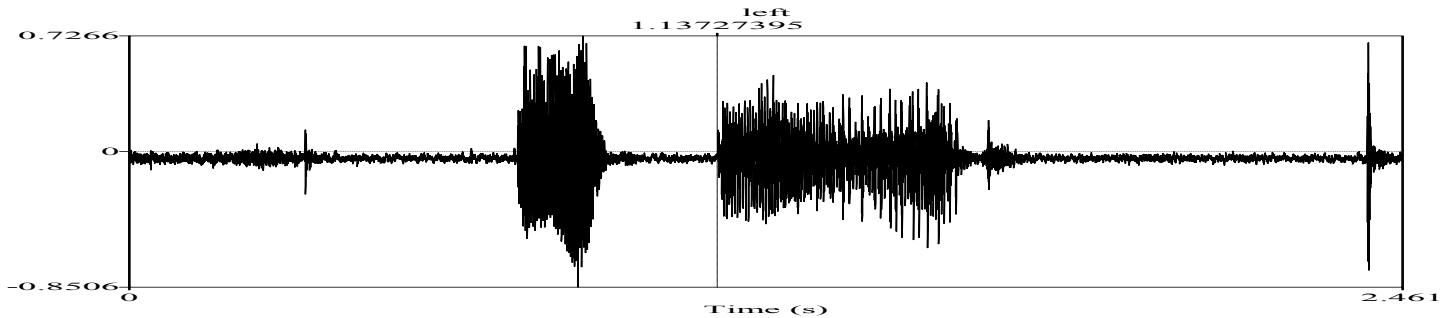


**Figure1 [iəʔ paŋ] 一帮(a gang of)**

The VOT in Figure1 is the time between the two doted lines, which is about 10 milliseconds.



**Figur2[iəʔpʰəŋ] 一喷 (be puffed out)**

The VOT in Figure2 is the time between the two dotted lines, which is about 30 milliseconds.
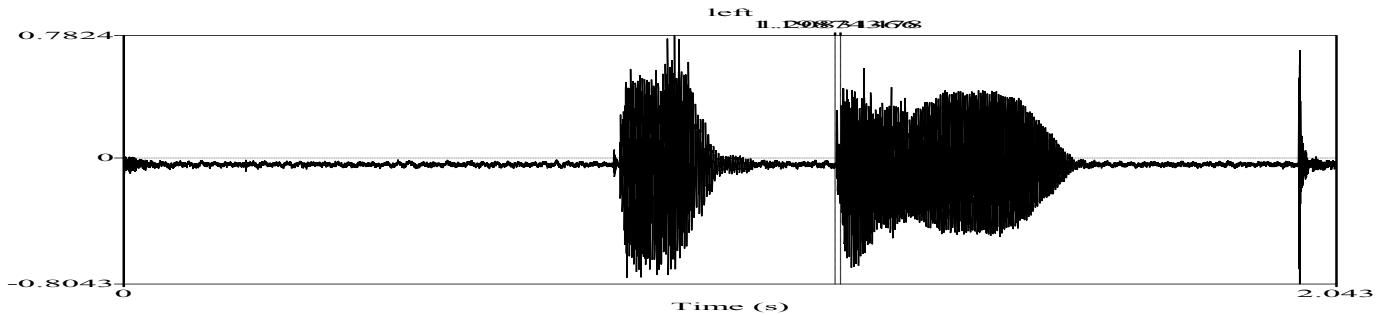


**Figure3[iəʔba] 一排(a row of)**
The VOT in Figure3 is zero.

According to Michael Ashby and John Maidment (2005: 94), the degree of aspiration of a plosive can be told by VOT. The longer the VOT is, the stronger aspirated the plosive is. A fully voiced plosive has no VOT, a voiceless unaspirated plosive has a short VOT, and an aspirated voiceless plosive has a long VOT.

So now the three spectrograms above prove to us that in Yixing dialect, the three initials are distinctive in aspiration, although they have the same place of articulation, for example[p] （帮）[pʰ](喷)[b](排)[3].

In fact, the case of [p][pʰ][b] is also true to other groups of plosives and affricates in Yixing dialect, such as alveolar plosives[t](端)[tʰ](透)[d](定), velar plosives[k](工)[kʰ](开)[g](共), alveolar affricates [tsʰ](草)[ts](资)[dz](虫), and alveolar-palatal affricates [tɕʰ](气)[tɕ](急)[dʑ](奇).

However, if we pronounce the three characters like 帮喷排 in Mandarin, we notice that the initial of 喷 and 排 is the same [pʰ]. That is to say, the voiced plosive is lost. The voiced and aspirated voiceless plosives are neutralized, appearing as the aspirated voiceless ones. So in Mandarin, we only have voiceless plosives, like in [tʰ](透),[t](定). and [kʰ](开)[k] (共).

Apart from the unaspirated and aspirated voiceless and voiced plosives, there is a glottal plosive [ʔ] in Yixing dialect. It unusually precedes a word without an initial. For example, 凹(an indent)[ʔɑu], 恩(gratitude)[ʔən] and so on.

*Fricatives*
The labiodental fricative[f] has two realizations in Yixing dialect—[f] and [v]. For example, 福 (blessings)is pronounced as [fɔ], 房(houses) is pronounced as [vɑŋ]. In addition, [w] in Mandarin is also replaced by [v] in Yixing dialect. An obvious example is 文(articles) in Mandarin is pronounced as [vən]. And because of the replacement of [w] by [v], there is only approximant [l] in Yixing dialect.

Retroflex fricative [ʂ] is missed and [ʐ] is realized as [ɲ] in Yixing dialect. For instance, 日(the sun) is pronounced as [ɲi]. Because of the absence of [ʂ], affricates are also influenced and show some distinctions between those in Mandarin. And we will talk about the distinctions later.

There also exist two alveolar fricatives [z] and [ʑ] which don't exist in Mandarin. E.g. 词 (words) [zi] and 齐 (uniform) [ʑi].

Glottal fricative is also a noticeable feature of Yixing dialect. Being different with Mandarin, who has one velar fricative [x], Yixing dialect owns two glottal fricatives— [h] and [ɦ]. For instance, both 花(flowers) and 孩(children) in Mandarin are started by [x], but in Yixing dialect, the initial of 花 and 孩 are [h] and [ɦ] respectively.

*Affricates*
The features of plosives and fricatives in Yixing dialect will definitely influence the affricates in Yixing dialect. As a result of the absence of retroflex fricative [ʂ], retroflex affricates such as [tʂ][tʂʰ] are replaced by alveolar affricates[ts][tsʰ]. What's more, the replacement is not necessarily being matched, that is to say, sometimes, [tʂʰ] could be pronounced as [tʂʰ] instead of [tsʰ]. For example, in Yixing dialect, the initial of 张(a piece of or a family name)， whose initial is [tʂ], is the non-retroflex counterpart [ts], while the initial of 虫(bugs), whose initial is [tʂʰ] in Mandarin, is actually [ts].

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[3]Here the sound in bracketsisactually the initial of the characterfollowingit.

*Nasals*

Apart from the nasals shared with Mandarin[m][n] and [ŋ], Yixing dialect has another nasal. For example, 娘 (mother) and 南(south) share the same initial [n] in Mandarin. However, when they are pronounced in Yixing dialect, the place of articulation of initial in 娘 is obviously backer than that in 南. I believe the initial of 南 is the same one with that in Mandarin[n], while the initial of 娘 is a palatal nasal [ɲ].

A specialty of nasals in Yixing dialect is that there are three syllabic consonants [m̩], [n̩] and [ŋ̍], which can be used as independent words to express meanings. For example, 畝(acreage)[m̩ ], 恨(to hate)[ n̩ ] and 午(noon)[ ŋ̍ ].

*Approximant*

There is only one alveolar approximant [l]in Yixing dialect. And the articulation and distribution are identical to that in Mandarin.

*The Diagram of Initials in Yixing dialect*

Now we have introduced all the initials are used in Yixing dialect and also have briefly introduced the distinctions between initials in Yixing dialect and in Mandarin. On the basis of the above analysis and the initial system in Mandarin concluded by Duanmu San (Duanmu San 2007: 12), we make a diagram of initials in Yixing dialect. See Figure4.

**Figure4**

| | | bilabial | labiodental | Alveolar | Palatal | Alvear-palatal | velar | glottal |
|---|---|---|---|---|---|---|---|---|
| plosive | Aspirated voiceless | pʰ | | tʰ | | | kʰ | |
| | Unaspirated voiceless | p | | t | | | k | ʔ |
| | Slack voice(voiced) | b | | d | | | ɡ | |
| nasal | | m | | n | ɲ | | ŋ | |
| fricative | voiceless | | f | s | | ɕ | x | h |
| | voiced | | v | z | | ʑ | | ɦ |
| affricate | Aspirated voiceless | | | tsʰ | | tɕʰ | | |
| | Unaspirated voiceless | | | ts | | tɕ | | |
| | Slack voice(voiced) | | | dz | | dʑ | | |
| approximant | | | | l | | | | |

*Vowels*

*Monophthongs*

Basically, Yixing dialect shares six monophthongs with Mandarin: a,o,e,i,u,ü. While the differences of height and location of these monophthongs in Yixing dialect and Mandarin should be examined by F1 and F2 with the help of Praat. So next, I will use Praat to record and analyze six monophthongs in Yixing dialect and Mandarin respectively, in order to the relative position of monophthongs in these two dialects.

Using Praat to detect the number of F1 and F2 of each monophthongs in the two dialects is a similar and repetitive process, therefore, for the sake of space, I will firstly take the measurement process of a as an example, while for the other monophthongs, only the results of measurement will be given.

In the first place, we recorded the word 爸(father) in Mandarin with Praat. The speech pressure waveform and spectrogram is as follows:
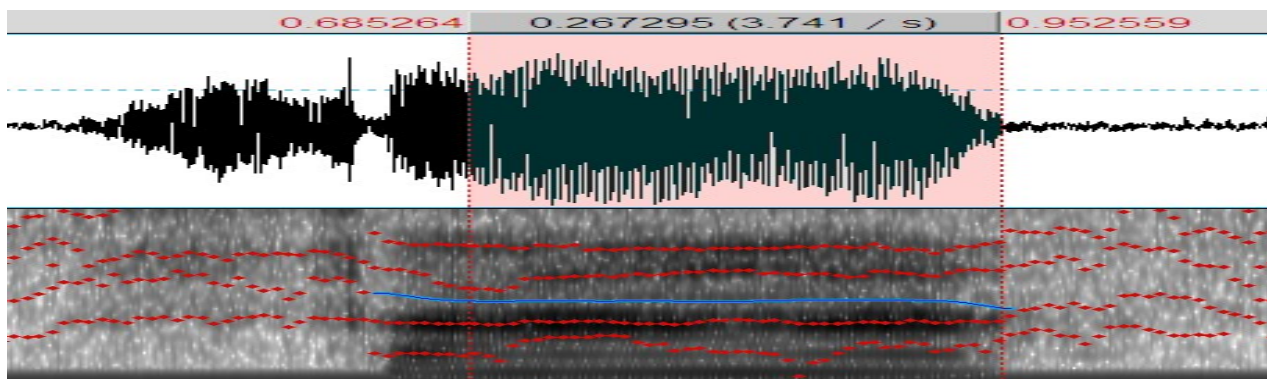
**Figure 5**
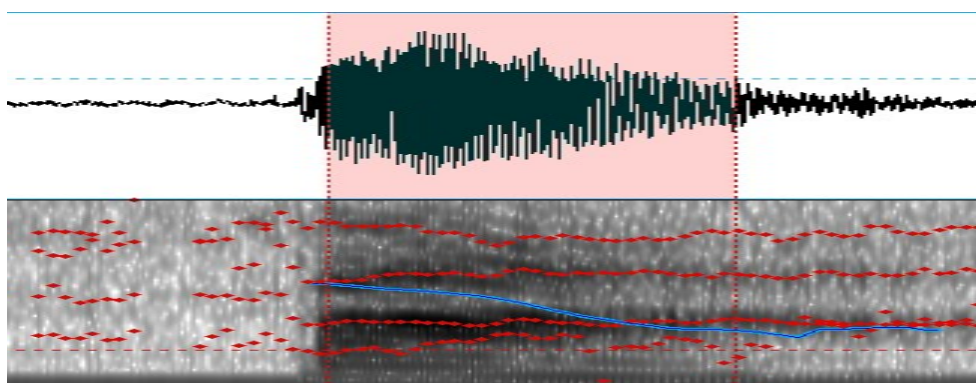


F1=1133.2  F2=1740.5

Then we recorded another word containing a in Mandarin 发(to give out) and the result goes like Figure6:

**Figure6**



F1=1012.6  F2=1746.2

So the average F1 for a is 1072.9, and average F2 is 1743.4

When the two words are pronounced in Yixing dialect, the waveforms and spectrograms are like following: See Figure7 and Figure8.

**Figure7**
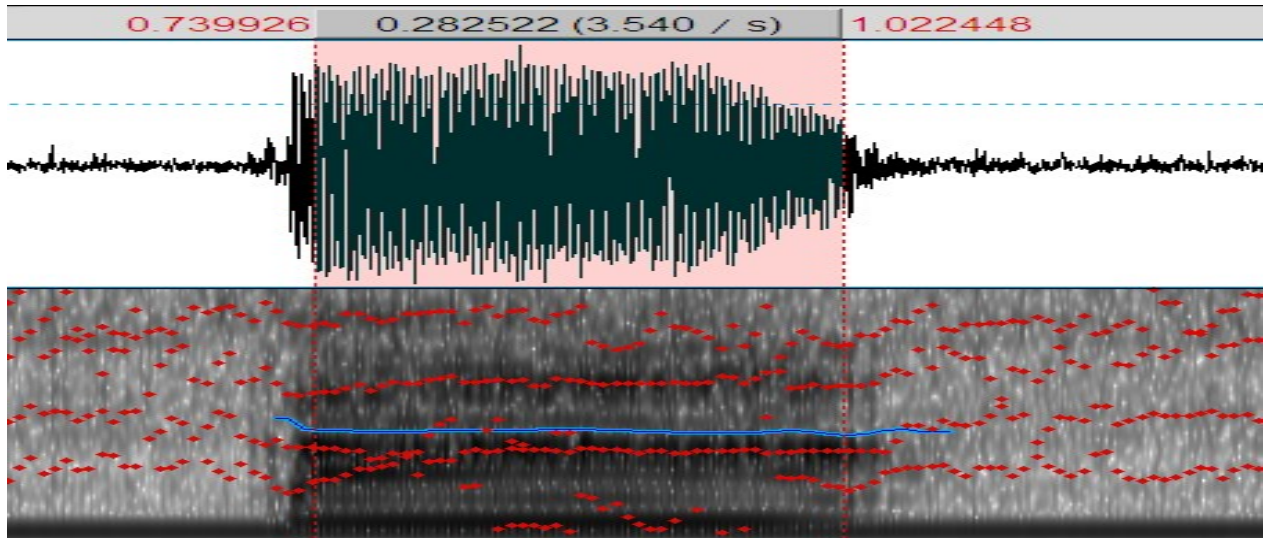


F1=936.1  F2=1906.6

**Figure8**
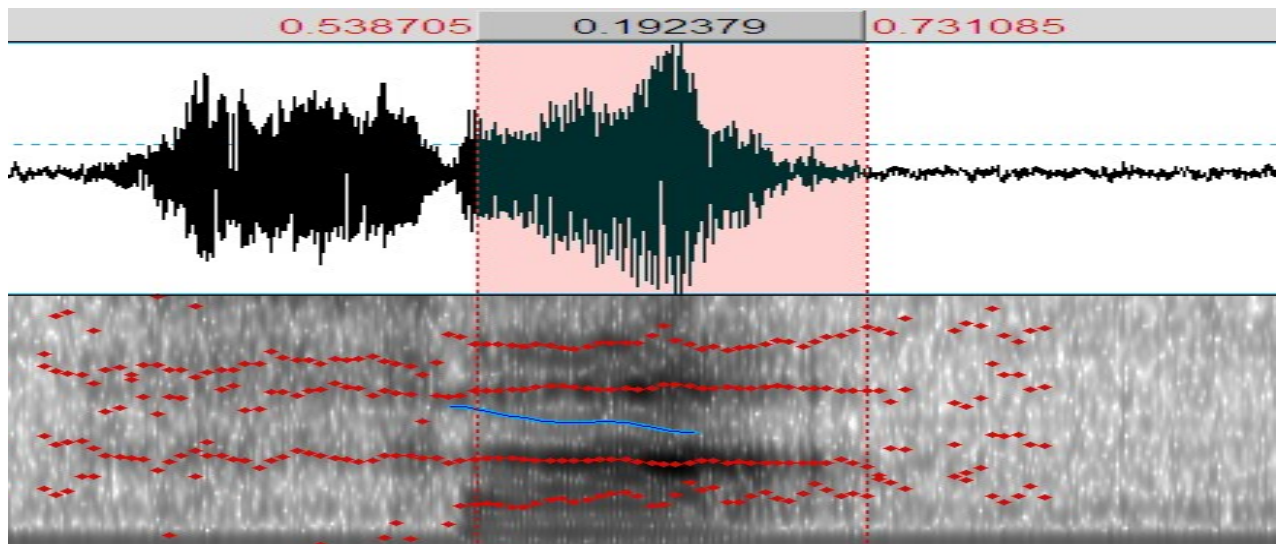


F1=1004.7  F2=1713.5

The average F1 is 970.4, and the average F2 is 1810.1.

Ashby and Maidment (2005) claims that that "high vowels have a low F1 and low vowels have a high F1,front vowels have a high F2 and back vowels have a low F2". And "the pattern of formant frequencies and their relationship to one another that is important rather than the absolute values". Therefore, according to the

average values of F1 and F2 of /a/ in Yixing dialect and Mandarin, we can conclude that compared with /a/ in Mandarin, /a/ in Yixing dialect is higher and is articulated in a more front position of the tongue.

So by following the above process, we can get the relative positions of the 6 monophthongs in Mandarin and Yixing dialect. The values can be put into the following Figure9:

**Figure9**

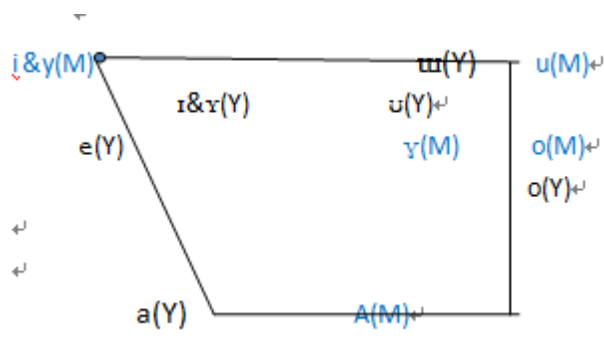| | Mandarin | | | | | | Yixing dialect | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $F1_1$ | $F1_2$ | average | $F2_1$ | $F2_2$ | average | $F1_1$ | $F1_2$ | average | $F2_1$ | $F2_2$ | average |
| | 1133.2 | 1012.6 | 1072.9 | 1740.5 | 1746.2 | 1743.4 | 936.1 | 1004.7 | 970.4 | 1906.6 | 1713.5 | 1810.1 |
| | 578.3 | 741.6 | 660.0 | 1063 | 1912.1 | 1487.6 | 772.6 | 714.3 | 743.5 | 1820.6 | 1122.6 | 1471.6 |
| | 572 | 510.3 | 541.2 | 1523.1 | 1438.8 | 1481.0 | 401.4 | 393.2 | 397.3 | 2026.1 | 2153.7 | 2089.9 |
| | 233 | 247.1 | 240.1 | 1760 | 1777.3 | 1768.7 | 316.4 | 343.9 | 330.2 | 1143.2 | 1087.3 | 1115.3 |
| | 437.7 | 371 | 404.4 | 1232.9 | 1129.4 | 1181.2 | 308.1 | 255.7 | 281.9 | 1799.3 | 2165.9 | 1982.6 |
| | 276.8 | 256.9 | 266.9 | 2172.1 | 2219.2 | 2195.7 | 300.2 | 289.9 | 295.1 | 1937.4 | 1926.5 | 1932.0 |

On the basis of the values we have got by Praat, we can conclude the relative positions of the monophthongs in Yixing dialect and Mandarin:

(1)    a in Yixing dialect is actually [a], higher and more forward than the Mandarin [A];
(2)    o in Yixing dialect [o] is articulated quite similarly as the one in Mandarin, but is a little bit lower;
(3)    e in Yixing dialect is more close to [e], higher and more forward than [ɣ] in Mandarin;
(4)    i in Yixing dialect [ɪ] is lower and less forward than [i] in Mandarin;
(5)    u in Yixing dialect [ɯ] is lower but more forward than [u] in Mandarin;
(6)    ü in Yixing dialect [ʏ] is lower and less forward than [y] in Mandarin.

According to the conclusions we have got so far, we can make the diagram of relative positions of vowels in Yixing dialect and Mandarin. (See Figure 10):

**Figure10**



However, apart from the 6 comparatively similar basic vowels of Yixing dialect and Mandarin, there exist three more monophthongs in Yixing dialect-----[ʊ],[ɨ] and [ə].

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Mr. Zhao Yuanren(1956:12) also confirmed that "Yixing dialect has two finely distinguished varieties of u". So now I give the more accurate description of the two varieties [ʊ] and [ɯ]: [ʊ] is more forward but lower than [ɯ], and when we articulate [ʊ] in Yixing dialect, the mouth is more rounded and open.

[ɨ] as an unrounded central high vowel, doesn't exist in Mandarin, but it does exist in Yixing dialect, such as in words like 兹[tsɨ] and 思[sɨ].

[ə] in Yixing dialect is articulated quite similarly to the one in English, but it doesn't appear as a final by itself. Instead, it's usually combined with [n] and [ʔ] to work as the final of a word.

*Diphthongs, Triphthongs and Other Combinations in Yixing Dialect*

In this part, I would like to call your attention to the form of diphthongs, triphthongs, and combinations of vowels and consonants in Yixing dialect.

Let's first look at the usual form of diphthongs and triphthongs in Yixing dialect, consisting of two or three vowels. They are [ɪa], [ɯa], [uo], [ue], [ɨ], [ɣɪ], [aɯ], [ai] and [ɣɯ]. Possible triphthongs in Yixing dialect include: [ɪaɯ][uaɪ][ɪɣɯ].

we have claimed just now, there is a special form of combinations in Yixing dialect, consisting of one vowel and one consonant or two vowels and one consonant. And the consonants included are actually proved to be only two: [n] and [ŋ]. So this kind of combinations include [aŋ][ən][ɪn][ɣn][oŋ] and [iaŋ][uən][uən][ɪoŋ].

Here we would like to clarify the appearance of final consonant [n] in [ən][ɪn][uən]. For native Yixing dialect speakers, [n] and [ŋ] are definitely two distinctive initials, but when they occur in the final position, the speakers of Yixing dialect can't distinguish them. Actually [n] in [ən][ɪn][uən]sounds quite like [ŋ] in practical speech. So I would like to identify [n] in the three combinations as a phoneme somewhere in betweem [n] and [ŋ].

These group of diphthongs and triphthongs are realized by shifting from the vowels to [n] and [ŋ], with the oral air passage is generally closed and the nasal cavity opens. As for the sonority, we need to notice that the most sonorant element of this kind of diphthongs and triphthongs is the second element, rather than the first element.

*Glottal Final in Yixing Dialect*

Like many other sub Wu dialects, the glottal final [ʔ] is quite a special feature of Yixing dialect compared with Mandarin. [ʔ] is attached to sounds ended with vowels like[a], [o] and [ə], forming finals like [aʔ][oʔ][əʔ][ɪaʔ][ɪoʔ][ɪəʔ][ɯaʔ][ɯəʔ] and [ɣəʔ].

Because of the appearance of glottal stop [ʔ], the vowels before it are quite short and when [ʔ] is articulated, the throat muscle is quite tense.

## Tone Sandhi Yixing Dialect

*Tone Patterns in Yixing dialect*

According to The Universal Phonetic Symbol Set in China[4], basically there are four tone patterns in Mandarin: Level Tone 55, Rising Tone 35, Falling-rise Tone 214 and Falling Tone 51. However, I notice that in Yixing dialect, there are four more patterns of tone, and even the tones seem to be similar to those in Mandarin show some differences. For example, the characters with the same T3 in Mandarin can have different tones in Yixing dialect. Let's see Figure 11and 12:

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**Figure11 走 ²¹⁴(walk)Figure12 买 ²¹⁴(buy)**
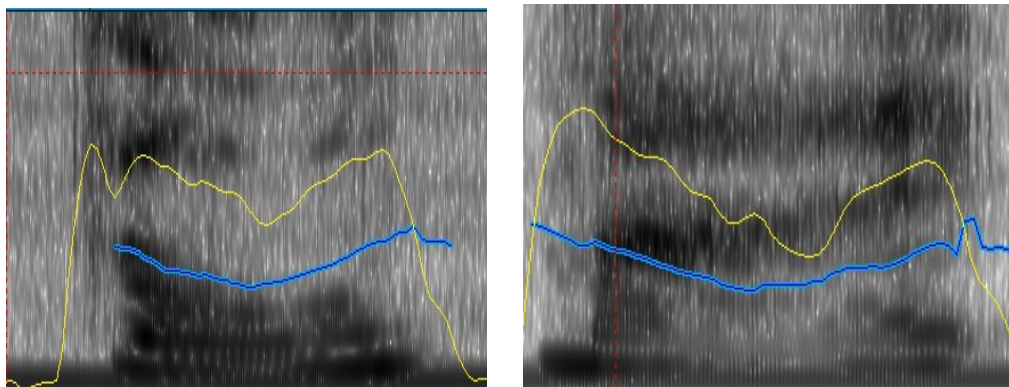


We can see from the above figures that the tone patterns are nearly the same. While when the two characters are articulated in Yixing dialect, we can see there are some differences: See Figure 13 and 14.

**Figure13 走 ⁵²(walk)Figure14 买 ³⁴(buy)**
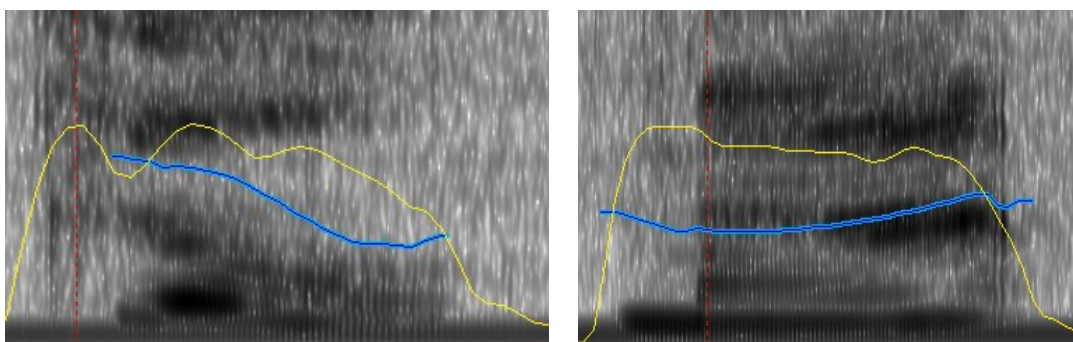


That is to say, the Falling-rising Tone 35 in Mandarin has two tonemes in Yixing dialect---tone 52 and 34. By using the same method, it's not difficult for us to find out that not only the Falling-rising Tone in Mandarin has two tonemes in Yixing dialect, but also the Rising Tone and Falling Tone do. The two tonemes of Rising Tone in Yixing dialect are tone 224 and 5, and the ones of the Falling Tone are tone 412 and 3.

After finding out all the tonemes in Yixing dialect, we should categorize them in a certain way. In dividing the four tones in Yixing dialect, I would like to refer to the division by Zhao Yuanren(1956). So there are four types of tones in Yixing dialect and each type of tone contains two varieties: pyngsheng(55 and 224), shaangsheng(52 and 34), chiusheng(412 and 21), and ruhsheng (5 and 3). He also claimed that there are two series of tones----Yin Diao(the lower series) and Yang Diao(the lower series)and therefore, tone 55 can also be named as the "yin pyng" such as 安 ⁵⁵ （safety）, 224 the "yang pyng" such as 穷 ²²⁴ （poverty）, 52 the "yin shaang" such as 走 ⁵² （to walk）, 34the "yang shaang" such as 马 ³⁴ （horse）, 412 the "yin  chiu" such as 变 ⁴¹² （to change）, 21 the "yang chiu" such as 恨 ²¹ （to hate）, 5 the "yin  ruh" such as 竹 ⁵ （bamboo）and 3 the "yang ruh" such as 入 ³ （to enter）. Ruhsheng, including Tone 3 and 5, is shorter than the other 3 type of tones in Yixing dialect. Moreover, there is a light tone, which is both light and short. For example, 佬 in the phrase 小佬 ⁰( kids).

*Tone Sandhi in Yixing Dialect*

So far, we have introduced the 8 tones in Yixing dialect. Just like many other wu dialects, tone sandhi is of great significance in studying the tone patterns in Yixing dialect. As a matter of fact, tone sandhi study is never an easy and fast matter; because many dialect linguists have studied tone sandhi in dialects even since 1940s and long-time discussions about this have been held. However, because of the complication of itself and many other objective reasons, a complete answer is not yet derived. In this part, I will adopt the method used by Ye Xiangling (1979:33-40), when he was studying Suzhou dialect (also a sub-dialect of Wu dialect). We do not expect to give a complete description of the tone sandhi in Yixing dialect, but I hope some phonological rules in tone sandhi can be concluded through the following study. And we will mainly focus on the tone sandhi of two-word phrases in Yixing dialect.

To begin with, we want to make my method clear: we have learnt that there are 8 tones in Yixing dialect, so we categorize some frequently used two-word phrases according to the tones of their first word. Then we get 8 groups of two-word phrases; again categorize the phrases in each group according to the tone of their second word. I will still use Praat here to help me make sure the tone change in the following phrases. To know the speaker's information, please refer to the information in Chapter1.

To begin with, let's see an example of showing how the following process will be operated.

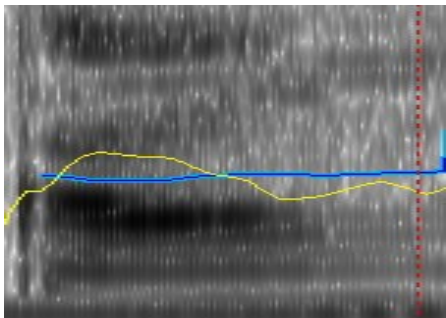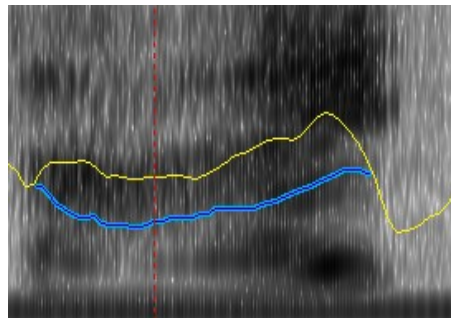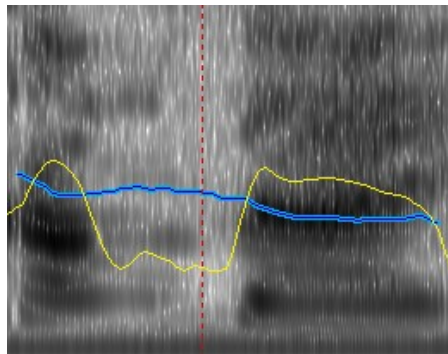Tone pattern of 刚 in Yixing dialect:        Tone pattern of 才 inYixing dialect:

**Figure15**                                **Figure16**



While when the two words are put together forming a phrase, the tone pattern is a little different from what they are alone:

**Figure17**

Generally, the three figures show a change of 刚 55,才 214→刚 55 才 44.

By following the above process, we can have a look at tone patterns of all the possible two-word phrases. See Figure18:

**Figure18:**

| Tone55 Grouop | |
|---|---|
| 刚 55,刚 55→刚 55 刚 44(just now) | 刚 55,才 214→刚 55 才 44(just now) |
| 新 55,手 52→新 55 手 21(freshman) | 超 55,懒 34→超 55 懒 44(very lazy) |
| 蔬 55,菜 412→蔬 55 菜 21(vegetables) | 烧 55,饭 21→烧 55 饭 21(to cook) |
| 心 55,得 5→心 55 得 4(what one learns from work or study) | 正 55,月 3→正 55 月 4(the first month of Lunar Calendar) |
| **Tone224 Group** | |
| 红 224,花 55→红 21 花 44(red flowers) | 穷 224,人 224→穷 21 人 224(poor people) |
| 茶 224,碗 52→茶 21 碗 52( tea bowl) | 糖 224,藕 34→糖 21 藕 34(sliced lotus root with sweet sauce) |
| 迟 224,到 412→迟 21 到 52(to be late) | 迷 224,雾 21→迷 21 雾 52(the mist) |
| 头 224,发 5→头 21 发 3 (hair) | 牛 224,肉 3→牛 21 肉 3 (beef) |
| **Tone52 Group** | |
| 火 52,车 55→火 55 车 55(trains) | 感 52,情 224→感 55 情 55(emotions) |
| 水 52,果 52→水 55 果 52(fruits) | 好 52,马 34→好 55 马 55(good horses) |
| 打 52,算 412→打 52 算 21(plans) | 漂 52,亮 21→漂 52 亮 21(beautiful) |
| 小 52,吃 5→小 55 吃 5(snacks) | 板 52,栗 3→板 55 栗 5(Chinese chestnuts) |
| **Tone34 Group** | |
| 冷 34,天 55→冷 21 天 55(a cold day) | 软 34,糖 224→软 21 糖 224(soft candies) |
| 慢 34,点 52→慢 34 点 44(be more slowly) | 玛 34,瑙 34→玛 34 瑙 21(agate) |
| 买 34,菜 412→买 34 菜 412(grocery shopping) | 买 34,饭 21→买 34 饭 21(to buy sth. to eat) |
| 冷 34,粥 5→冷 21 粥 5(cold porridge) | 网 34,络 3→网 21 络 3(the network) |
| **Tone412 Group** | |

| | |
|---|---|
| 信 $^{412}$,封 $^{55}$→信 $^{44}$ 封 $^{55}$(the envelop) | 太 $^{412}$,阳 $^{224}$→太 $^{44}$ 阳 $^{44}$(the sun) |
| 对 $^{412}$,比 $^{52}$→对 $^{45}$ 比 $^{52}$(contrasts) | 变 $^{412}$,软 $^{34}$→变 $^{41}$ 软 $^{34}$(getting soft) |
| 故 $^{412}$,意 $^{412}$→故 $^{41}$ 意 $^{412}$(purposely) | 对 $^{412}$,岸 $^{21}$→对 $^{45}$ 岸 $^{21}$(the other side of the river) |
| 快 $^{412}$,速 $^{5}$→快 $^{412}$ 速 $^{5}$(quickly) | 泡 $^{412}$,沫 $^{3}$→泡 $^{412}$ 沫 $^{5}$(soapsuds) |
| **Tone21 Group** | |
| 夏 $^{21}$,天 $^{55}$→夏 $^{21}$ 天 $^{24}$(summer) | 旧 $^{21}$,年 $^{224}$→旧 $^{21}$ 年 $^{24}$(last year) |
| 老 $^{21}$,板 $^{52}$→老 $^{21}$ 板 $^{24}$(the boss) | 漏 $^{21}$,水 $^{34}$→漏 $^{21}$ 水 $^{24}$(water leaking) |
| 大 $^{21}$,蒜 $^{412}$→大 $^{21}$ 蒜 $^{24}$(garlic) | 护 $^{21}$,士 $^{21}$→护 $^{21}$ 士 $^{21}$(the nurse) |
| 外 $^{21}$,国 $^{5}$→外 $^{21}$ 国 $^{3}$(foreign countries) | 眼 $^{21}$,热 $^{3}$→眼 $^{21}$ 热 $^{3}$(to envy) |
| **Tone 5 Group:** | |
| 一 $^{5}$,千 $^{55}$→一 $^{4}$ 千 $^{55}$(one thousand) | 失 $^{5}$ 眠 $^{224}$→失 $^{4}$ 眠 $^{55}$(be sleepless) |
| 吃 $^{5}$,饱 $^{52}$→吃 $^{4}$ 饱 $^{21}$(be full) | 吃 $^{5}$,水 $^{34}$→吃 $^{4}$ 水 $^{21}$(to drink water) |
| 恶 $^{5}$,化 $^{412}$→恶 $^{4}$ 化 $^{412}$(getting worse) | 一 $^{5}$,定 $^{21}$→一 $^{4}$ 定 $^{21}$(surely) |
| 一 $^{5}$,切 $^{5}$→一 $^{5}$ 切 $^{5}$(everything) | 碧 $^{5}$,绿 $^{3}$→碧 $^{5}$ 绿 $^{5}$(dark green) |
| **Tone 3 Group:** | |
| 热 $^{3}$,天 $^{55}$→热 $^{2}$ 天 $^{55}$(a hot day) | 绿 $^{3}$,茶 $^{224}$→绿 $^{2}$ 茶 $^{224}$(green tea) |
| 日 $^{3}$,本 $^{52}$→日 $^{2}$ 本 $^{52}$(Japan) | 白 $^{3}$,马 $^{34}$→白 $^{2}$ 马 $^{52}$(a white horse) |
| 学 $^{3}$,费 $^{412}$→学 $^{2}$ 费 $^{52}$(tuition) | 绿 $^{3}$,豆 $^{21}$→绿 $^{2}$ 豆 $^{21}$(mung beans) |
| 蜡 $^{3}$,烛 $^{5}$→蜡 $^{2}$ 烛 $^{5}$(candles) | 学 $^{3}$,习 $^{3}$→学 $^{2}$ 习 $^{4}$(to learn) |

Up till now, we have listed the 64 kinds of two-word phrases in Yixing dialect, and also tone sandhi is of them are also marked. In order to show the tone sandhi is in a more systematic way, I also summarize the rules in the following table. See Figure 19:

**Figure19**

|  | 55 | 224 | 52 | 34 | 412 | 21 | 5 | 3 |
|---|---|---|---|---|---|---|---|---|
| 55 | 55-44 |  | 55-21 | 55-44 | 55-21 |  | 55-4 |  |
| 224 | 21-44 | 21-224 | 21-52 | 21-34 | 21-52 |  | 21-3 |  |
| 52 | 55-55 |  | 55-52 | 52-55 | 52-21 |  | 55-5 |  |
| 34 | 21-55 | 21-224 | 34-44 | 34-21 | 34-412 | 34-21 | 21-5 | 21-3 |
| 412 | 44-55 | 44-44 | 45-52 | 41-34 | 41-412 | 45-21 | 412-5 |  |
| 21 | 21-24 |  |  |  |  | 21-21 | 21-3 |  |
| 5 | 4-55 |  | 4-21 | 4-412 |  | 4-21 | 5-5 |  |
| 3 | 2-55 | 2-224 | 2-52 |  |  | 2-21 | 2-5 | 2-4 |

Notice: Columns show tones of first words, rows show tones of second words, and the other grids show the tone of a two-word phrase in which the tone in the column comes first and the tone comes second.

Next step is to find out all the variants of each toneme and to discover the positions each variant will take.

Tone 55 has got 3 variants: tone 55, 44 and 24. Tone 55 can take both the first and second position in two-word phrases. But variants Tone 44 and 24 can only take the second position when the first tone is Tone55, 224, 34 and Tone 21 respectively.

Tone 224 has 4 variants: Tone 55, 44, 24 and 21. Tone 21 is the variant of Tone 224 when it is the tone of the first word. Variant Tone 55 appears in the second position when the first tone is Tone 52 and 5. Variant Tone 44 and 24 appear when the first tone is 55, 412 and 21 respectively. Except above situations, Tone 224 is still itself as the tone of the second word.

Tone 52 has 5 variants: Tone 52, 55, 21, 44 and 24. Tone 52 and 55 both can work as the initial tone of a phrase. Tone 52 appears before Tone 412 and 21, and tone 55 appear before the other 6 tones. When tone 52 works as the tone of the second word, it has four variants: tone 52, 21, 44 and 24. When it follows tone 55 and 5, it is changed into tone 21; when it follows tone 34, it is changed into tone 44; when the tone preceding it is tone21, it is changed into tone 24; and in other situations, it remains to be tone52.

Tone34 has 4 variants: tone34, 55, 21 and 52. As the initial tone, tone34 can be the forms of both tone34 and 21. When it precedes tone 52, 34, 412 and 21, it remains to be tone 34. When it precedes other four tones, it is changed into tone 21. As the ending tone, it can be the forms of tone 34,55,21,52. It remains tone 34 after tone 224 and 412. It's changed into tone55 after tone 55 and 52; tone21 after tone 34 and 5; tone 52 after tone3.

Tone412 is a more variable tone with 8 variants: tone412, 21, 52, 22, 24, 45 and 41, but the positions of each variant are relatively stable. Tone 412 can take both the initial and ending positions in phrases, while tone44, 45 and 41 can only take the initial position and tone 21, 52 and 24 can only take the final position in two-word phrases.

Tone21 is a stable and influential tone, with only 2 variants: tone21 and 52. In the initial tone position, it's always tone21, no matter which tone is following it. In the final tone position, only when tone224 precedes it, it is changed into tone52. In other situations, it remains to be tone21.

Tone5 has 3 variants: tone5, 4 and 3. When it functions as the initial tone, it can be both tone4 and 5. If the following tone is tone5 or 3, it remains tone5; otherwise, it is changed into tone4. When it works as the final tone, it remains to be tone5 except for the situations where the following tone is 55, 224 or 21.

Tone3 has got 5 variants: tone2, 3, 4 and 5. Only the variant tone2 can work as the initial tone in a two-word phrase. But in the final tone position, it can be the forms of tone 3, 4 and 5. When it's after tone 52, 412 and5, it is changed into tone5; when it's after tone224, 34 and 21, it remains to be tone3; and after tone55 and 3, it's changed into tone4.

From the above observations, there are some rules can be discovered:

    a.  The tone of most words will be changed when they form a two-word phrase with another word.

    b.  Some tone sandhis are resulted by tone assimilation. For instance, tone224 and 34 are changed into tone55 when they are after tone55. Another example is tone412 is changed into tone45 when it's before tone 52.

    c.  Tone55 and tone5 are the most stable tones in Yixing dialect. In most situations, they remain themselves without changing.

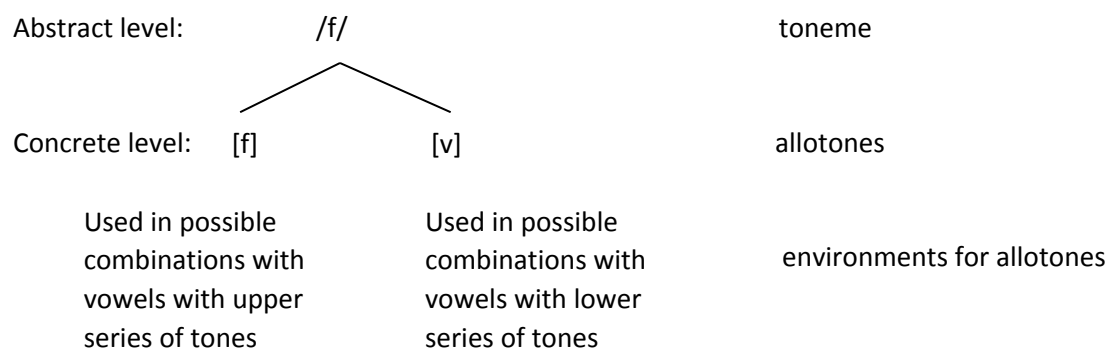## The Distribution of [F] and [V] in Yixing Dialect

The co-existence of [f] and [v] in Yixing dialect is one of the facts that need to be studied in this phonological part. Since Mandarin has only the voiceless labiodental fricative[f], words initialed by [f] should be divided into two categories in Yixing dialect with initial [f] or [v]. I turn to the Diagram of Homophones in Yixing Dialect in the Record of Yixing County (1990), and by examining the distribution of [f] and [v] in all possible combinations with finals. From the diagram of homophones in Yixing dialect, I find that we have pairs of words like 方[faŋ] and 房 [vaŋ], which only differ in tones. So, I decided to study the distribution of [f] and [v] in Yixing dialect from the perspective of tones.

Then I conclude the following chart, see Figure 20:

**Figure 20**

| | | ɪ | | ʊ | | a | | oʔ | | əʔ | | ɪao | | e | | əʊ | | aŋ | | ən | | ɔŋ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | f | v | f | v | f | v | f | v | f | v | f | v | f | v | f | v | f | v | f | v | f | v |
| Pyng-sheng | 55 | + | | + | | + | | | | | | | | | | + | | + | | + | | + | |
| | 224 | | + | | + | | + | | | | | | | | | | + | | + | | + | | + |
| Shaang-sheng | 52 | + | | + | | + | | | | | | | | + | | | | + | | + | | | |
| | 34 | | | | | | + | | | | | | | | | | | | | | + | | |
| Chiu-sheng | 412 | + | | + | | + | | | | | | | | + | | | | + | | + | | + | |
| | 21 | | + | | + | | + | | | | | | | | | | | | + | | + | | + |
| Ruh-sheng | 5 | | | | | + | | + | | + | | | | | | | | | | | | | |
| | 3 | | | | | | + | | + | | + | | | | | | | | | | | | |

From the above table, we learn that generally speaking, [f] and [v] in Yixing dialect are in complementary distribution. Although it may not be matched one by one, in possible combinations with the 11 finals, [f] appears only in combinations with upper series (Tone 55, 52, 412 and 5) and [v] only appears in combinations with lower series (Tone 224, 34, 21 and 3). Therefore, I believe [f] and [v] in Yixing dialect are actually allotones of /f/ and their relation could be described as follows:

Abstract level:          /f/                              toneme

Concrete level:      [f]              [v]                 allotones

| Used in possible combinations with vowels with upper series of tones | Used in possible combinations with vowels with lower series of tones | environments for allotones |

## Summary

This paper mainly studies Yixing dialect from the perspective of phonetics and phonology. By comparative analysis, the sound system of Yixing dialect is derived. Some comments to the characterized phonetic facts in Yixing dialect are also made. We found that Yixing dialect shares the typical three-division plosives with other Wu dialects and also it has its own unique consonant and vowels, in terms of the place and manner of articulation. In phonology part, analysis of the 8 tones and tone sandhi in two-word phrases are included. Also, the possible distribution rule of [f] and [v] in Yixing dialect is given by looking at the tone environment of them. Our conclusion is that [f] and [v] in Yixing dialect are actually allotones of /f/, but they appear in different phonological environments and are almost in complementary distribution.

This study on Yixing dialect is based on former studies on other Wu dialects. We hope this study can benefit my own later more detailed study on Yixing dialect and if possible, can also make contributions to English learning for Yixing dialect speakers.

## About the Author

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