Three Puzzles of the Dominant Yinping Tone in Mandarin Onomatopoeias

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Abstract: Yinping tone is dominant in Mandarin onomatopoeias and there are three puzzles behind it: (a) Does this tonal distribution pattern exist since ancient or is it caused by diachronic evolution? (b) If this tonal distribution is caused by diachronic evolution, then what is the process of the diachronic evolution? (c) What is the restrictive mechanism behind this pattern of tonal distribution? First, this article examines the tonal distribution pattern, diachronic evolution of syllable size and structure type from five historical periods: from the Western Zhou Dynasty to the Spring and Autumn Period, the Tang Dynasty, the Yuan Dynasty, the middle Qing Dynasty and the contemporary China. Second, it tries to provide the key that unlocks the three puzzles one by one. Finally, four conclusions related to the subject are presented.

Keywords: onomatopoeia, Yinping tone, diachronic evolution, restrictive mechanism

1. Introduction

Scholars have pointed out that contemporary Mandarin (or Beijing dialect) onomatopoeias are characterized by Yinping tone, regardless of the number of syllable(s). For example, Monosyllable: huā (哗, ‘sudden sound of a group’), pāng (乓, ‘sound of a gun shooting, or a door closing forcefully’), hōng (轰, ‘sound of thunder or cannon’), dōng (咚, ‘sound of something heavy falling’); Disyllable: huāhuā (哗哗, ‘sound of flowing water’), huālā (哗啦, ‘sound of something flowing down or falling down’), hōnglōng (轰隆, ‘dull and continuous sound’), pīngpāng (乒乓, ‘sound of something colliding’); Three-syllable: huālālā (哗啦啦, ‘sound of something flowing down, or gathering objects dispersedly falling at the same time’), hōnglōnglōng (轰隆隆, ‘dull and continuous sound’),

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① See Zhu Dexi (1982), Meng Cong (1983), Ma Qingzhu (1987), Shi Yuzhi (1995), Guo Xiaowu (2003), Yang Shusen (2006), Wu Xiaohua (2009), Chu Taisong (2012) and Wang Jue (2012), etc.
gūlōngdōng (古隆冬, ‘sound of objects rolling’), pāpāpā (啪啪啪, ‘sound of a slapping, or sound of a gun shooting’); Four-syllable: huālāhuālā (哗啦哗啦, ‘continuous sound of something flowing down’), huāhuālā (哗哗啦啦, ‘sound of running water, or small and gathering objects dispersedly falling at the same time’), jīlīguālā (叽里呱啦, ‘speak loudly’) (Tang Tingchi, 1996:1-28). But the following three puzzles have not aroused people’s attention yet:

(a) Yinping tone is dominant in all the Mandarin onomatopoeias. Is this phenomenon existed since ancient or the result of diachronic evolution?

(b) If the tonal distribution of Mandarin onomatopoeias is the result of diachronic evolution, then what is the process of it?

(c) What is the restrictive mechanism behind the tonal distribution and the diachronic evolution of onomatopoeias in Mandarin?

Several scholars have tried to answer those questions (Ma Qingzhu, 1987; Xiao Xianbin, 2005; Yang Shusen, 2006; Chu Taisong, 2012), but the answers are far from satisfaction. In view of this, this article tries to solve the three puzzles one by one, by investigating the history of Chinese onomatopoeias’ tonal variety. To this end, we select and collect the data of onomatopoeias from the following books, which are representing different historical periods:

(a) The Book of Songs: from the Western Zhou Dynasty to the Spring and Autumn Period (1046BC- 476BC);

(b) Complete Collection of Tang Poems: the Tang Dynasty (618AD-907AD);

(c) Yuan Qu: a type of verse popular in the Yuan Dynasty (including Zaju and Sanqu), represents the Yuan Dynasty (1271AD-1368AD);

(d) A Dream of Red Mansions: the middle of the Qing Dynasty (1736AD-1850AD);

(e) Modern Chinese Dictionary (5th Edition): contemporary Mandarin (in the late 20th century).

In the following sections, first, we will examine the tonal distribution pattern, syllable number and structure type of the onomatopoeias in the books mentioned above to show their diachronic evolution. Then, we’ll try to reveal the keys that unlock the three puzzles and finally present four conclusions related to the subject.

2. The tonal distribution pattern, syllable number and structure type of the onomatopoeias

2.1 The tonal distribution pattern of onomatopoeias from the Western Zhou Dynasty to the Spring and Autumn Period

\footnote{For this section of the data, see Shi Xiangdong (2004).}
There are 47 onomatopoeias in *The Book of Songs*. In accordance with the phonetic notation of *The Annotation of Classics*, they are distributed in the four ancient tones (level tone, falling-rising tone, falling tone, entering tone). The numbers and percentages are shown in table 1.

| syllable size | A pattern | AA pattern | total |
|---------------|-----------|------------|-------|
|               | NO. of onomatopoeias | NO. of onomatopoeias | NO. | PCT |
| level tone | 6 | 25 | 31 | 66% |
| falling-rising tone | 2 | 4 | 6 | 13% |
| falling tone | 0 | 3 | 3 | 6% |
| entering tone | 0 | 7 | 7 | 15% |

A pattern: [level tone] yīn (殷, ‘thunder’), qiāng (玱, ‘sound of percussion, or impact of jade’), nǎo (呶, ‘hubbub, clamour’), gū (呱, ‘sound of a child crying’); [falling-rising tone] yá (嘔, ‘sound of a female pheasant crying’), tān (呿, ‘sound of many people eating’)

AA pattern: [level tone] guāng (关关, ‘sound of birdsong’), zhēngzhēng (丁丁, ‘sound of logging, playing chess, or playing piano’), qiāngqiāng (锵锵, ‘sound of a bell or impact of jade’), yīngyīng (嘤嘤, ‘sound of a bird tweeting, or a low, subtle sound’); [falling-rising tone] kānkān (坎坎, ‘sound of carriage traveling’), kǎnkǎn (坎坎, ‘sound of cutting trees’), xǔxǔ (许许, ‘sound made by all when they worked together’), huīhuī (ไหว, ‘thunder’); [falling tone] huīhuī (ไหว, ‘rhythmic sound of a bell’), huīhuī (ไหว, ‘sound of flapping wings to fly high’), huīhuī (ไหว, ‘sound of a cicada singing’); [entering tone] sùsù (肃肃, ‘sound of wind’), zhìzhì (摻摻, ‘harvesting/reaping sound’)

The onomatopoeias from the Western Zhou Dynasty to the Spring and Autumn Period are distributed in the four ancient tones as shown in table 1. Most of them are level tone, accounting for 66% of the total. The sum of the remaining three tones is 34%.

### 2.2 The tonal distribution pattern of onomatopoeias in the Tang Dynasty

According to Wei Mingfeng (2011), *Complete Collection of Tang Poems* has 354 onomatopoeias. The amounts and percentages are listed in table 2.

The tonal distribution of onomatopoeias in the Tang Dynasty has the following salient features as shown below:

(a) Level tone is the most distributed tone in number and takes 46.9% of the total; followed by Entering tone, which accounts for 39.5% of the total; Falling-rising tone and
Falling tone are the least in number, each of which is accounting for only 6.8% of the total.

Table 2. The Tonal Distribution of Onomatopoeias in *Complete Collection of Tang Poems*

| Tonal Type       | NO. of onomatopoeias | PCT  |
|------------------|-----------------------|------|
| level tone       | 166                   | 46.9%|
| falling-rising   | 24                    | 6.8% |
| falling tone     | 24                    | 6.8% |
| entering tone    | 140                   | 39.5%|

(b) The sum of falling-rising tone, falling tone and entering tone are 53.1% of the total, which means that the level tone and the rest of the three almost account for half for each.

(c) Compared with *The Book of Songs* as shown in table 1, the percentage of level tone is decreased by nearly 20%, but is still close to half of the total. Entering tone increases rapidly from 15% to 39.5%. The ratio of falling-rising tone and falling tone is lower, especially the proportion of falling-rising tone, which is reduced by half. The sum of the two is only 13.6%. In addition, Wei Mingfeng (2011) also counts the onomatopoeias’ AB pattern and their tonal combinations, which are listed in table 3 (slightly adapted).

Table 3. The Tonal Combinations of Onomatopoeias’ AB Pattern in *Complete Collection of Tang Poems*

| i. level tone | ii. falling-rising tone | iii. falling tone | iv. entering tone | Total |
|---------------|-------------------------|-------------------|-------------------|-------|
| ai            | 79                      | 3                 | 12                | 134   |
| aii           | 3                       |                   |                   | 3     |
| ai i          | 7                       |                   |                   |       |
| aiv           | 45                      |                   |                   | 91    |
| biv           | 2                       |                   |                   | 2     |
| b. falling-rising tone | 0                  | 0                 |                   | 2     |
| c. falling tone | 0                   | 0                 |                   | 6     |
| ci            | 0                       |                   |                   |       |
| ci i          | 3                       |                   |                   |       |
| ci ii         | 3                       |                   |                   |       |
| d. entering tone | 7                  | 0                 |                   | 50    |
| di            | 0                       |                   |                   |       |
| di i          | 2                       |                   |                   |       |
| di ii         | 41                      |                   |                   |       |
| Table 3 shows that the tonal combination of “level tone + level tone” is 79, which accounts for 41.1% of the total. Second, the combination, starting with level tone is 134, accounting for nearly 70% of the total. Perhaps these two numbers also help to explain that level tone also occupies the dominant position even in the disyllable onomatopoeias in the Tang Dynasty.

2.3 The tonal distribution pattern of onomatopoeias in the Yuan Dynasty

There are 446 onomatopoeias in *Yuan Qu* and are expressed by 266 Chinese characters, 61 of which cannot be found in Central Plains Rhyme. The tonal distributions of the rest 205 Chinese characters in Central Plains Rhyme are shown in table 4. Examples as follows:

[Yin tone] dăng (珰, ‘sound of metal impacting’), wāng (汪, ‘sound of a dog barking’), dòng (咚, ‘sound of a heavy thing falling or drumming’), wēng (嗡, ‘sound of cattle, or sound of insects’), jiū (啾, ‘small cries of animals’); [Yang tone] chán (潺, ‘sound of stream flowing’), cōng (淙, ‘sound of stream

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On the amount of onomatopoeias in the Yuan Dynasty, Zhao Jingming (1981) is 240; Zhang Wenchao (2011) is 440; Zhao Aiwu (2012; 2013a) are 508 and 507. This article uses the basic data of Zhang Wenchao (2011) for the statistics and analysis of tones.
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flowing’), ào (嗷, ‘sound of wail’), nán (喃, ‘continuously whispering/murmuring’); [Shang tone] bù (卜, ‘low and continuous sound’), gǔ (鼓, ‘drumming sound’), xiǎng (响, ‘larger sound’), yǎ (哑, ‘sound of laughter’); [Qu tone] lì (呖, ‘clear and melodious sounds of birds’), luò (落, ‘sound of rain’), xù (絮, ‘talking continuously’), zào (噪, ‘noise of crowd or chirrup’)

Table 4. The Tonal Distribution of Onomatopoeias in Yuan Qu

| tone | NO. of characters of onomatopoeias | PCT     |
|------|-----------------------------------|---------|
| Yin  | 73                                | 35.6%   |
| Yang | 35                                | 17.1%   |
| Shang| 74                                | 36.1%   |
| Qu   | 23                                | 11.2%   |

Table 4 shows the following two characteristics of the tonal distribution pattern of onomatopoeias in the Yuan Dynasty:

(a) Level tone (including Yin, Yang) is 52.7% of the total, which is 5.8% higher than that in the Tang Dynasty. Compared to the slight decrease in the Tang Dynasty, level tone of onomatopoeias starts to stabilize in the Yuan Dynasty, but has not yet reached the level of the Western Zhou Dynasty to Spring and Autumn Period. The sum of Shang and Qu is 47.3% of the total, which is 5.8% lower than those in the Tang Dynasty.

(b) In the language history, level tone goes to Yin and Yang equally. Voiced falling-rising tone becomes falling tone and entering tone goes to the rest tones, which are called three big changes in tonal system. Theoretically, four dramatic changes should take place in the tone of onomatopoeias: First, the tonal distribution of onomatopoeias starts to change from four ancient tones (level tone, falling-rising tone, falling tone, entering tone) into “modern” ones (Yin, Yang, Shang, Qu). Second, entering tone of onomatopoeias goes into Yin, Yang, Shang, Qu. Third, parts of falling-rising tone of onomatopoeias goes to Qu. Forth, level tone of onomatopoeias goes to both Yin and Yang. The words of Yin are 35.6% of the total and 67.6% of the Yin and Yang. In other words, the Yin onomatopoeias have taken the initiative from the beginning of the split between Yin and Yang. Yin onomatopoeias become overwhelming in Mandarin and this is just a beginning of the dominant Yinping tone in Mandarin onomatopoeias.①

2.4 The tonal distribution pattern of onomatopoeias in the mid Qing Dynasty②

A Dream of Red Mansions has 106 onomatopoeias. Their distributions are shown in table 5. Examples of Yin tone as follows:

① The details of “the entering tone goes to the rest three tones” can be found in Lin Tao (1992:3-18).
② This section of the corpus and data are mainly referred to Huang Shengtai (2011) and also referred to Zhao Aiwu (2013b).
Table 5. The Tonal Distribution of Onomatopoeias in *A Dream of Red Mansions*

| Tone | No. of Onomatopoeias | PCT |
|------|----------------------|-----|
| Yin  | 91                   | 86% | 91% | 100% |
| Yang | 5                    | 5%  |     |     |
| Shang| 1                    | 1%  | 9%  |     |
| Qu   | 9                    | 8%  |     |     |

Table 5 shows that the tonal distribution of onomatopoeias in the mid Qing Dynasty has changed as follows:

(a) Level tone of onomatopoeias increases greatly from 52.7% (the Yuan Dynasty) to 91%, nearly as much as twice in the Yuan Dynasty and 44.1% higher than that in the Tang Dynasty (46.9%). This creates a new record in terms of the number of level tone, even higher than the one in the time period from the Western Zhou Dynasty to the Spring and Autumn Period (66%) for the first time. On the other hand, the sum of the Shang and Qu onomatopoeias is dropped sharply from 47.3% (the Yuan Dynasty) to 9%.

(b) Yin onomatopoeias are up to 86%, 50.4% higher than that in *Yuan Qu* (35.6%), while Yang onomatopoeias only occupy the limited 5%.

(c) As the entering tone disappears in the northern dialect, the original entering tone of onomatopoeias has been completely changed into the rest of the three tones.

2.5 The tonal distribution pattern of onomatopoeias in Mandarin

Some scholars have made statistical analyses of contemporary onomatopoeias on different versions of *Modern Chinese Dictionary*, including their quantity and tonal distribution. Yang Shusen (2006) makes statistics on the version in 2002. Yuan Mingjun (2007), Yu Zhe (2010) and Chu Taisong (2012) respectively make counted statistics on the version in 2005. The detailed data are in table 6, while the data by scholar Yuan Mingjun and Chu Taisong is not comprehensive. Yang Shusen makes the statistic by words, while Yu Zhe makes it by syllables (277 onomatopoeias with 388 syllables). The data from Yang Shusen and Yu Zhe are slightly different. In addition, the statistic result of Chu Taisong (2012) is: More than 70% onomatopoeias’ whole syllable(s) is/are Yin. And the percentage reaches 83.5% when we count those whose first syllable is Yin.\(^1\) According to Yang

\(^1\) Chu Taisong (2012) also points out that the onomatopoeias of non-Yin are mostly disyllabic ancient words, which are not used in modern spoken English.
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Shusen’s study, Yin and Yang takes 97.7% of total 136 onomatopoeias. Yin is 92.6% of total, which is highly innovative on the basis of the middle of Qing Dynasty (86%).

Table 6. The Tonal Distribution of Onomatopoeias in Modern Chinese Dictionary

| tone       | Yang Shusen (2006) | Yuan Mingjun (2007) | Yu Zhe (2010) | Chu Taisong (2012) |
|------------|---------------------|---------------------|---------------|--------------------|
| NO.        | PCT                 | NO. PCT             | NO. PCT       | NO. PCT            |
| Yin        | 126                 | 92.6%               | 307           | 77.6%              | 91%                | 83.5%              |
| Yang       | 7                   | 5.1%                | n/a           | 52                 | 13.4%              | n/a                |
| Shang      | 1                   | 0.7%                | 225           | n/a                | 8                  | 2.1%               |
| Qu         | 2                   | 1.5%                | n/a           | 27                 | 7%                 | 9.1%               |
| Neutral-tone | 0                   | 0%                  | n/a           | 0                  | 0%                | n/a                |

Second, the monosyllabic onomatopoeias, characterized by their Yin tone, are also formed into multisyllabic onomatopoeias, thus “almost all disyllabic onomatopoeias are Yin” (Shi Yuzhi, 1995). For example, there are 51 “Yin+Yin” onomatopoeias, 3 “Yang +Yang” onomatopoeias, 1 “Shang+ Shang” and 1 “Qu+ Qu” in AB pattern, while only 16 onomatopoeias are with two inconsistent syllables (Wu Xiaohua, 2009:52).

From the above, the tone of onomatopoeias with monosyllable, disyllables, three syllables and four syllables is almost Yin in Mandarin, while only the second syllable of the four-syllable onomatopoeias is neutral-tone. In other words, almost all onomatopoeias in contemporary Mandarin are Yin. (See also Meng Cong, 1983; Guo Xiaowu 2003)

3. The puzzles

3.1 The answer to Puzzle one

Puzzle One: All the Mandarin onomatopoeias are Yinping tone. Is it existed since ancient or the result of diachronic evolution?

This is the simplest question and easiest to answer. In fact, the discussion in Section Two has offered the answer, which can be summarized as follows:

Almost all onomatopoeias in contemporary Mandarin are Yin, which is the result of diachronic evolution rather than existed since ancient.

3.2 The answer to puzzle two

Puzzle Two: If the tonal distribution of Mandarin onomatopoeias is the result of diachronic evolution, then what is the process of it?

Table 7 is the summary of the conclusions on the onomatopoeias’ tonal distribution in Section Two, which can be served as the key that unlocks puzzle two. It clearly shows that the tonal distribution pattern of onomatopoeias has experienced four stages since the Western Zhou Dynasty (around 3000 years ago).
Table 7. The Comparison of Onomatopoeias’ Tonal Distribution in Different Time Periods

| Tone             | Western Zhou to Tang | Yuan | Mid-Qing | Contemporary era |
|------------------|-----------------------|------|----------|------------------|
| Level tone       |                       |      |          |                  |
| Yin              | 66%                   | 35.6%| 86%      | 92.6%            |
| Yang             | 34%                   | 64.4%| 14%      | 7.4%             |
| Falling-rising   | 13%                   | 36.1%| 1%       | 0.7%             |
| Falling tone     | 6%                    | 11.2%| 8%       | 1.5%             |
| Entering tone    | 15%                   | 0%   | 0%       | 0%               |

The Western Zhou Dynasty to the Tang Dynasty is the first stage: Onomatopoeias are distributed in the four ancient tones (level tone, falling-rising tone, falling tone and entering tone) and level tone occupies half of the total. Although the proportion of level tone once reduced from 66% to 46.9%, it is still almost equivalent to the sum of the rest three tones (53.1%). This tonal distribution pattern is balanced, which is almost consistent with the Chinese ancient tonal system.①

The Yuan Dynasty represents the second stage: Onomatopoeias begin to distribute in the four modern tones (Yin, Yang, Shang, Qu), of which Yin and Yang are in a slim majority. Among them, Yin is twice more than Yang, thus Yin obviously occupies a dominant position, which lays the foundation for Yin onomatopoeias in Mandarin.

The Mid-Qing Dynasty is the third stage: level tone onomatopoeias rise to 91% of total. Yin is 86%, while Yang is only 5%. It can be said that Yin already occupies an absolute advantage in onomatopoeias.

Contemporary Mandarin is the fourth stage: level tone onomatopoeias rise again to 97.7%. Yin is up to 92.6% and is almost overwhelming in onomatopoeias.②

Thus, the answer to the second puzzle can be summed up as follows:

The tonal distribution pattern of onomatopoeias is changed through four stages: Onomatopoeias are always distributed in the four ancient tones and level tone occupies half of the tones from the Western Zhou Dynasty to the Tang Dynasty. Onomatopoeias start to distribute into four modern tones in the Yuan Dynasty and most of them are level tone, in which are almost Yin. In the middle of the Qing Dynasty, onomatopoeias are further concentrated in Yin. Now, onomatopoeias are almost Yin in contemporary Mandarin.

3.3 The answer to the first part of puzzle three

Puzzle Three: What is the restrictive mechanism behind the tonal distribution and the

① The Northern dialect is generally considered to be equal to the Yin and Yang no later than 14th century, for the Central Plains Rhyme, written by Zhou Deqing, has clearly differentiated Yin and Yang.

② Guo Xiaowu (2003) considers the remaining three tones to be a temporary variant yielded to a sentence tone. Peng Zerun (2006) considers they are Yin from the perspective of words’ tonal patterning.
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This puzzle is more complex. For the sake of discussion, let’s divide it into two halves: The first half is: why the onomatopoeias have been distributed in the four ancient tones from the Western Zhou Dynasty to the Tang Dynasty, while the level tone is always the majority? The second half is: why the onomatopoeias have gradually unified in Yin since the Yuan Dynasty? The first half relates mainly to the internal adjustment of Mandarin system and the second half involves external factors.

Now, let’s answer the first half of puzzle three.

Trying to approximate the sound of the objective nature, Onomatopoeias are primitive words which are formed by the subjective human speech sounds. “Onomatopoeias should be as close to the phonetic value of the objective nature as possible. This is the internal requirement of a language” (Wang Futang, to be published), onomatopoeias also maintain the highest level of interactivity with the sound system in which it resides. Therefore, if we want to reveal the first half of puzzle three, we should look deep into the tonal system of ancient Chinese language and its diachronic evolution. With regard to the tonal system of ancient Chinese and its diachronic evolution, there are many theories in academia, of which the view by Shu Zhiwu (2002) has the most enlightening implications to the unlocking of the first half of puzzle three. Shu Zhiwu proposed: The primitive Chinese language “has only one natural level tone, but with different rhyme tails of the syllable (Yin, Yang and Entering tone). The tonal evolution of Yin and Yang is ‘level tone to falling-rising tone to falling tone’ and so it is true with the tonal evolution of entering tone”. This tonal differentiation has not established the tonal system of ancient Chinese (level tone, falling-rising tone, falling tone and entering tone) until Han-Wei. In this ancient tonal system, level tone undoubtedly occupies an advantage. It can be assumed that: Chinese initial onomatopoeias are also level tone, including relaxed-rhyme and tense-rhyme, and then they differentiate falling-rising tone and entering tone successively. In the case of the practice of the academic circle, considering tense-rhyme as entering tone, the tonal evolution of Chinese onomatopoeias can be expressed as follows:

| Western Zhou Dynasty (2 tones system) | Qin-Han Dynasty (3 tones system) | Wei-Jin Dynasty (4 tones system) |
|--------------------------------------|---------------------------------|---------------------------------|
| Onom. with level tone                | relaxed-rhyme Onom.             | Onom. with falling tone         |
|                                      | tense-rhyme Onom.               |                                 |
|                                      | Onom. with falling-rising tone  |                                 |
|                                      |                                 | Onom. with falling tone         |

The above-mentioned differentiation process not only helps to explain the history of the development and evolution of Chinese tones, but also explains the reason why onomatopoeias with level tone in *The Book of Songs* are much more than those in *Complete Collection of Tang Poems*. Because the onomatopoeias with level tone in *The Book of Songs*...
Songs are gradually split into the falling-rising tone and falling tone, the statement that “the onomatopoeias from the Western Zhou Dynasty to the Spring and Autumn Period (including Warring states and Han-Wei) are distributed in the four ancient tones” is actually a beautiful misunderstanding. In this historical stage, the Chinese tonal system has undergone gradually a long process from unified ancient level tone to four ancient tones. Therefore, the accurate statement should be: onomatopoeias start to distribute into the four ancient tones in Wei-Jin, and this tonal distribution pattern in the northern dialects keeps on until “going halves between Yin and Yang” era.①

Thus, the answer to the first half of puzzle three can be summed up as follows:

The tonal distribution pattern of onomatopoeias does not always exist in a steady state from the Western Zhou Dynasty to the Tang Dynasty, it can be divided into two stages: onomatopoeias are unified in the ancient level tone from the Western Zhou Dynasty to the Eastern Han Dynasty; they begin to distribute in the four ancient tones with the formation of the four ancient tones in Wei-Jin.

3.4 The answer to the second half of puzzle three

Let’s answer the second half of puzzle three. Why the onomatopoeias have gradually unified in Yin since the Yuan Dynasty? There are three reasons: the preconditions in a language, the internal causes of a language and the external reasons of a language.

3.4.1 Two Preconditions

3.4.1.1 Precondition one: onomatopoeias with multisyllable enable the tone to gradually lose its function in differentiating meanings

With the decline and fall of the ancient Chinese morphological forms, the phonetic system has been greatly simplified in Han-Wei period. Although the four-tone system has been produced, it is still not enough to compensate for the reducing phonetic function in differentiating meanings, caused by the disappearance of the form. This determines that words can only evolve into multiple syllables to increase the differentiated form. Secondly, since the Eastern Han Dynasty, the Buddhist vocabulary system has already absorbed the existing disyllable words in Chinese, and created a large number of multisyllable vocabularies, including onomatopoeias, and the frequency of the multisyllable vocabularies is far more than the local literature vocabulary system and even much more than the spoken vocabulary system in the same period (Zhu Qingzhi 1992:124-131). These two factors influence the structure type of Chinese onomatopoeias, and gradually makes it multi-syllable and diversified. It is enough to illustrate it just by reviewing the historical changes of Chinese onomatopoeias’ syllable size and structure type since the Western Zhou

① Of course, if the four ancient tones’ system has already formed in the pre-Qin Dynasty (Zhang Bo, 1996), the problem is much simpler.
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Dynasty briefly.
(a) The syllable size and structure type of onomatopoeias from the Western Zhou Dynasty to the Spring and Autumn Period

Table 8. The Syllable Size and Structure Type of Onomatopoeias in The Book of Songs

| example | NO. of words | PCT |
|---------|--------------|-----|
| A pattern | yīn (殷) | 8 | 17% |
| AA pattern | guānguān (关关) | 39 | 83% |

Table 8 shows that the syllable size of onomatopoeias from the Western Zhou Dynasty to the Spring and Autumn Period only has both A pattern and AA pattern, including 8 monosyllables (A pattern, 17% of the total) and 39 disyllables (AA pattern, 83% of the total).①

(b) The syllable size and structure type of onomatopoeias in the Tang Dynasty②

Table 9. The Syllable Size and Structure Type of Onomatopoeias in the Tang Dynasty

| syllable(s) | patterns | NO. | PCT |
|-------------|----------|-----|-----|
| one | A | 1 | 5.7% |
| two | AA | 3 | 78.9% |
| | AB | 3 | 78.9% |
| | A + rán (然) / ěr (尔) | 3 | 78.9% |
| three | ABB | 2 | 1% |
| | ABC | 2 | 1% |
| four | AABB | 3 | 14.4% |
| | ABCD | 3 | 14.4% |
| | Others | 2 | 28.6% |

Examples as follows:
A + rán (然) / ěr (尔) pattern: hōngrán (訇然, ‘loud sound of door opening’); ABCD pattern: ăoyăzhāozhā (呕哑嘲哳, ‘noise of confusion’); pattern of Others: jiăojiăogă (咬咬嘎嘎, ‘sound of water birds’)

Compared with The Book of Songs as shown in table 8, table 9 shows that the syllable size and structure type of onomatopoeias in the Complete Collection of Tang Poems have changed as follows:

① According to Guan Xiechu (1981), the bronze inscription has already appeared 5 onomatopoeias of AABB pattern in the Western Zhou Dynasty. According to Zhao Aiwu & Tang Xin (2014), The Book of Songs and Mozi also have a few AABB -pattern onomatopoeias.
② For this section of corpus and statistics, see Wei Mingfeng (2011) and Zhao Aiwu (2013a).
i. Their syllable size develops from monosyllable and disyllable onomatopoeias, in The Book of Songs, to three-syllable and four-syllable onomatopoeias.

ii. According to the percentages in table 9, the four kinds of onomatopoeias can be arranged as follows: Disyllable > Four-syllable > Monosyllable > Three-syllable. Among them, monosyllabic onomatopoeias have reduced from 17% to 5.7%, while multisyllabic ones have increased from 83% to 94.3%. In multisyllable onomatopoeias, the disyllabic ones are on the top of the list (78.95%) and four-syllabic ones are very few, while the percentage of three-syllabic ones is only 1%.

iii. Compared to the two patterns (A and AA) in The Book of Songs, the structure type develops into 9 patterns. The AA pattern of disyllabic onomatopoeias in The Book of Songs develops into AB pattern and A + rán (חלק, suffix) / ěr (חלק, suffix); Three-syllabic onomatopoeias have two patterns of ABB and ABC; four-syllabic onomatopoeias have three patterns: AABB, ABCD, and others.

(c) The syllable size and structure type of onomatopoeias in the Yuan Dynasty①

Compared with that in the Tang Dynasty as shown in table 9, table 10 shows that the syllable size of onomatopoeias in the Yuan Dynasty has the following remarkable features.

i. The syllable size of onomatopoeias inherits the four kinds from the Tang Dynasty.

ii. According to the percentages shown as follows, the four kinds of onomatopoeias in the Yuan Dynasty can be arranged as: Disyllable > Three-syllable > Four-syllable > Monosyllable.

|            | Monosyllable | Disyllables | Three syllables | Four syllables |
|------------|--------------|-------------|-----------------|---------------|
| Tang Dynasty | 5.7%         | 78.9%       | 1%              | 14.4%         |
| Yuan Dynasty | 6.6%         | 37.3%       | 29.8%           | 26.4%         |

Compared with the Tang Dynasty, it's clear that the percentage of monosyllabic onomatopoeias change slightly. The multisyllabic onomatopoeias have huge disparities from each other in the Tang Dynasty, while the three kinds of multisyllabic onomatopoeias in the Yuan Dynasty are closely equal to each other. In this time period, the disyllabic onomatopoeias is still top-ranking but no longer a solo show because the percentage has fallen by half; the three-syllabic onomatopoeias are increased to 29.8% sharply; the percentage of the four-syllabic onomatopoeias has risen by nearly half.②

iii. The structure type, including monosyllable, further develops to 17 patterns and gets the first highest in history. The structure type of disyllable is almost as same as in the Tang

① On the amount of onomatopoeias in the Yuan Dynasty, Zhao Jingming (1981) is 240; Zhang Wenchao (2011) is 440; Zhao Aiwu (2012; 2013a) are 508 and 507. This article uses the basic data of Zhang Wenchao (2011) for the statistics and analysis of tone.

② In addition, Zhou Fagao (1975:430-431) induces the four-syllabic onomatopoeias have 18 phonetic patterns in Yuan Qu. Zhou also points out that the 18 phonetic patterns do not be used a lot before the Yuan Dynasty, but can be seen in the contemporary Beijing dialect.
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Dynasty; The structure type of three-syllable develops from 2 patterns in the Tang Dynasty to 4 patterns while the amount of four-syllabic patterns develops from three to more than ten.

Table 10. The Syllable Size and Structure Type of Onomatopoeias in the Yuan Dynasty

| syllable(s) | patterns | NO. of patterns | NO. of words | PCT |
|-------------|----------|----------------|-------------|-----|
| one         | A        | 1              | 29          | 6.6%|
| two         | AA       | 2              | 65          | 37.27%|
|            | AB       |                | 49          |      |
| three       | AAA      | 4              | 9           |      |
|            | ABB      |                | 78          |      |
|            | ABC      |                | 15          |      |
|            | AA rán (然) / xī (兮) | 2         |            |      |
| four        | ABCD     | 10             | 440         | 93.4% 100%|
|            | ABB      |                | 6           |      |
|            | ABBC     |                | 5           |      |
|            | ABAB     |                | 6           |      |
|            | ABAC     |                | 1           |      |
|            | ABCB     |                | 8           |      |
|            | ABCC     |                | 4           |      |
|            | A liū (留) BC |        |            |      |
|            | A liū (留) AB |            |            |      |
|            | A diū (丢) BC |        |            |      |

Examples as follows:

AA rán (然) / xī (兮) pattern: wūwūrán (呜呜然, ‘cry of the dragon’, lìlìxī (呖呖兮, ‘scream of the phoenix’); A liū (留) BC pattern: chīlūshūlā (赤留束拉, ‘sound of the strong wind’); A liū (留) AB pattern: chīlūshūlā (赤留束拉, ‘sound of quickly walking’); A diū (丢) BC pattern: pǐlǐpǎlā (劈里扑搭, ‘voice of quick talk’); ABAC pattern pattern: gēzhīgēzhā (咯吱咯喳, ‘sound of chewing’); ABBC pattern pattern: shūlūlūshū (疏剌剌刷, ‘sound of the wind blowing leaves’); ABCB pattern pattern: lìliānluó (囃囃啰啰, ‘singing voice’); ABCC pattern pattern: dīnglíngdōnglóng (丁零咚隆, ‘sound of objects rolling’)

(d) The syllable size and structure type of onomatopoeias in the middle of Qing Dynasty

(1) This section of the corpus and data are mainly referred to Huang Shengtai (2011) and also referred to Zhao Aiwu (2013b).
Compared with the Yuan Dynasty as shown in table 10, table 11 shows that the syllable size and structure type of onomatopoeias in the middle of Qing Dynasty have the following characteristics:

i. The syllable size of the onomatopoeia still inherits the four kinds from the Tang Dynasty.

ii. The following data shows that the percentage of monosyllabic onomatopoeias grows evidently from 6.6% in the Yuan Dynasty to 22%, while multisyllabic ones drop from 93.4% to 78%.

| Syllable(s) | One | Two | Three | Four |
|-------------|-----|-----|-------|------|
| Monosyllable| A   | AB  | ABB   | AABB |
| Disyllables | 6.6%| 37.3%| 29.8% | 26.4% |
| Three syllables | 22% | 44% | 9% | 26% |

Secondly, the rough balance among the three multisyllabic onomatopoeias, established in the Yuan Dynasty, is broken in the middle of the Qing Dynasty: the disyllabic onomatopoeias are still on the top of the list and slightly increase; four-syllabic ones change nothing; Three-syllabic ones drop a lot.

iii. The structure type decreases from 17 patterns in the Yuan Dynasty to 9 patterns in the middle of Qing Dynasty. It is really a great shrinkage. The structure type of four-syllable decreases most, for the ABBC pattern, ABCB pattern, ABCC pattern, A ǐù (留) BC pattern, A ǐù (留) AB pattern and A diù (丢) BC pattern in Yuan Qu no longer occur in the middle of the Qing Dynasty. Among 9 patterns of the structure type in this period, AB pattern, A pattern, AABB pattern and AA pattern are with a high percentage, while ABAB pattern, A ǐù (留) BC pattern, ABAC pattern and ABCD pattern are extremely low.

Table 11. The Syllable Size and Structure Type of Onomatopoeias in A Dream of Red Mansions

| Syllable(s) | Structure Type | NO. of Patterns | NO. of Words | PCT |
|-------------|----------------|----------------|--------------|-----|
| One         | A              | 1              | 23           | 22% |
|             | AB             | 2              | 28           | 26% |
|             | AA             | 19             | 47           | 44% |
| Two         | ABB            | 1              | 9            | 18% |
|             | AABB           | 9              | 106          | 8%  |
|             | ABAB           | 21             | 20%          | 2%  |
|             | A diù (丢) BC | 2              | 27           | 26% |
|             | ABAC           | 1              | 1            | 1%  |
|             | ABCD           | 1              | 1            | 1%  |

(e) The syllable size and structure type of onomatopoeias in Mandarin.

Table 12 shows the characteristics of the syllable size and structure type of onomatopoe-
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i. The syllable size of the onomatopoeia is still inherited the 4 kinds from the Tang Dynasty.

ii. According to the following data, monosyllabic onomatopoeias account for 19.76% of the total in contemporary Mandarin, while multisyllabic ones are 80.24%. This is basically inherited from the middle of Qing Dynasty pattern. Although disyllabic onomatopoeias are still the first, the percentage of them is slightly reduced, however, the four-syllabic ones ascend to the second, but with little rising in percentage. By contrast, three-syllabic ones are the lowest, but increase in percentage.

iii. The structure type grows from 9 patterns in the middle of the Qing Dynasty to 17 patterns in contemporary Mandarin, the patterns of three-syllable and four-syllable respectively create 4 new patterns, which is basically equal to the Yuan Dynasty, although the patterns are different.

Table 12. The Syllable Size and Structure Type of Onomatopoeias in Mandarin

| syllable(s) | patterns | type | NO. | NO. | PCT  |
|-------------|----------|------|-----|-----|------|
| one         | A        | 1    | 167 | 19.76% |
| two         | AA; AB   | 2    | 321 | 37.99% |
| three       | AAA; AAB; ABA; ABB; ABC | 5    | 121 | 14.32% |
| four        | AAAAA; AABB; ABAB; ABBB; ABAB; ABCD; A li (里) AC; A li (里) BC; AA qing (庆) A | 9    | 236 | 27.93% |

Examples as follows:

A pattern: wā (哇, 'sound of crying or vomiting'); AA pattern: guāguā (呱呱, ‘sound of a frog or a crow’); AB pattern: guājī (呱唧, 'sound of the applause'); AAA pattern: guāguāguā (呱呱呱, ‘sound of

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1 This is almost the same as the statistics of 19.7% from Yang Shusen (2006), but there is a big gap when compare with 6.6%, which is from Yu Zhe (2010).

2 Xu Hao (1998) divides the status words of ABB pattern into 3 types including 10 kinds and onomatopoeia is only one of the “I” type.
a duck or laughter, unclear speech’); AAB pattern: *dídí* (滴滴, ‘sound of the clock’s pointer’); ABA pattern: *jījī* (唧唧, ‘whispering voice’); ABB pattern: *dīnglínglíng* (叮铃铃, ‘sound of the bell’); ABC pattern: *pīpī* (霹霹, ‘sound of an object breaking’); AAAA pattern: *pāpāpā* (啪啪啪啪, ‘sound of shooting’); AABB pattern: *huáhuá* (哗哗, ‘sound of running water, or small and gathering objects dispersedly falling at the same time’); ABAB pattern: *gūgū* (咕咕, ‘sound of drinking’); ABBB pattern: *pūlēlnglēng* (扑棱棱, ‘sound of a bird flying’); ABAB pattern: *xīlihuā* (稀里哗哗, ‘sound of rain, or objects falling’); AA qing (庆) A pattern: *cāngcāngqīngcāng* (仓仓庆仓, ‘sound of gongs and drums’)

The percentage, syllable size and structure type of onomatopoeias in the five historical stages can be compared in table 13.

| Era                      | Pattern(s)                                      | Total | NO. | PCT | NO. | PCT | NO. | PCT | NO. | PCT |
|--------------------------|-------------------------------------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|
| Western Zhou to Spring & Autumn | Monosyllabic: 17% | 1 | 83% | 0 | 0% | 0 | 0% | 2 | 100% |
| Tang Dynasty             | Disyllabic: 5.7% | 1 | 78.9% | 3 | 1% | 0 | 0% | 9 | 100% |
| Yuan Dynasty             | Three-syllabic: 6.6% | 1 | 37.3% | 2 | 4 | 29.8% | 10 | 26.4% | 17 | 100% |
| Mid-Qing Dynasty         | Four-syllabic: 22% | 1 | 44% | 4 | 9% | 5 | 26% | 17 | 9% |
| Contemporary era         |                                  | 19.8% | 2 | 38% | 5 | 14.3% | 9 | 27.9% | 17 | 100% |

Table 13 shows that the diachronic evolution of Chinese onomatopoeias’ syllable size and structure type has some main characteristics from the Western Zhou Dynasty to now.

(a) The percentage of monosyllabic onomatopoeias has gone through a saddle-shaped process, but has never exceeded 22% of the total.

(b) The percentage of multisyllabic onomatopoeias has gone through a “high but slightly reduced” process, and all kinds of trends are uneven. But the total amount remains above 78%.

(c) The syllable size goes big. In the Western Zhou Dynasty, there are only monosyllable and disyllable, which develop into four kinds in the Tang Dynasty and remain so till today.

(d) The structure type grows sharply, too. In the Western Zhou Dynasty, there are only A

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Monosyllabic and disyllabic onomatopoeias are the oldest, and then the frequency of them goes down; three-syllable begins in the Tang Dynasty, and the frequency is from high to low and slightly heads up in contemporary; four-syllable also begins in the Tang Dynasty. Its frequency goes to peak in the Yuan Dynasty, and then is roughly the same.
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and AA pattern, while in contemporary Mandarin the patterns have increased to 17 ones. In short, as the onomatopoeias’ syllable(s) are lengthened and the structure type of them is varied gradually, the phonetic style of onomatopoeias is greatly enriched, which directly leads to the fact that the tone of onomatopoeias is getting increasingly unimportant in the function of differentiating meanings.

3.4.1.2 Precondition two: The neutral-tone is incompatible with onomatopoeias

When the tone of pitch becomes increasingly unimportant in the function of differentiating meanings and gradually lose its role, the tone of onomatopoeias seems to have only two ways out: one is to lose the original level tone and become neutral-tone; the other is to remove the cadence of falling-rising tone, falling tone and entering tone and become level tone. In fact, Chinese onomatopoeias choose the latter one. The reason is that the neutral-tone is incompatible with onomatopoeias. On the one hand, although the neutral-tone appears at the end of the Song Dynasty and the early Yuan Dynasty, its development is really limited, since it is difficult to be spoken clearly out because of its lightness and ambiguity. Words of pure neutral-tone have been oriented to functional words, such as modal words, interjection, structural particles, body particles, commonly used directional nouns, individual quantifiers, prepositions, conjunctions and others, which are highly closed and in highest degree of grammaticalization, while words of semi-neutral tone move in the direction of content words;① On the other hand, onomatopoeias are different in syllable size, rich in the patterns of structure type, not highly closed in amount and in lowest degree of grammaticalization, so that they are really incompatible with pure neutral-tone by nature and it is difficult for them to become semi-neutral tone, too. So far only the second syllables of four-syllabic onomatopoeias have been the neutral-tone, which is affected by the assimilation of four-syllable ineffable mode in Chinese. Therefore, the onomatopoeias only can develop to level tone first and then evolve further to Yin.

So far, we have discussed the gradual loss of the differentiated function of multisyllabic onomatopoeias, and the neutral-tone is incompatible with onomatopoeias. These two preconditions make the tone of onomatopoeias only gradually move towards the situation of “overwhelming Yin”.

3.4.2 Two internal causes

3.4.2.1 One of the internal causes: unmarkedness of level tone

The tone of voiceless initials is high and the tone of voiced initials is low, so that the four ancient tones have 8 pitches, but there is no phonemic difference between voiceless

① The “Pure neutral-tonal words” and “semi-neutral tonal words” are our own term. The former refers to words, of which all the syllables are neutral-tone. The latter refers to words, of which only the first syllable, middle syllable or tail syllable is neutral-tone and the remaining syllables maintain in the original tone category and pitch.
initials and voiced initials (only the initial condition variants), so the tone of voiceless initials and the tone of voiced initials are generally consistent. Shi Chuzhong (806 AD - 820 AD) describes that: the level tone is declined and peaceful; falling-rising tone is sharp and heading on; falling tone is clear and far; entering tone is straight and short. Shi Zhenkong (Ming Dynasty) gives more popular description in his *Jade Key Rhyme Formulas*: level tone is flat and not rising or falling; falling-rising tone is shouted violently strong; falling tone keeps clear and long as well as sounds grief; entering tone is short and stops urgent. Gu Yanwu (Late Ming and early Qing Dynasties) speculates on their respective length as, “The level tone is the longest, the second is falling-rising tone, and entering tone stops abruptly”. Zhu Xiaonong (2013) proposes: level tone is a long tone; falling-rising tone is a mid-long tone; entering tone is a short tone. Integrating pitch and length, ancient level tone is mid-long and flat and the falling-rising tone rises abruptly with falsetto and glottal stop ending, while falling tone is a descending tone. The above analysis is good, but the following two factors are also needed to consider. First, onomatopoeias have no specific characters in origin and use homonyms or near-sound words to record frequently. The tone of the words used to record onomatopoeias may have long been consistent with the tone of the onomatopoeias they recorded, that is, they may have been Yin since they recorded onomatopoeias. Second, the ancient poetry and rhyme only divides tones into two categories (level and oblique tones), which may help to illustrate that in practice the literati emphasize tonal antagonism between level tones and oblique tones at that time (is essentially a short and long relationship), and pay less attention to the four tones. As for contemporary Chinese, the four tones are mainly determined by pitch and secondly by the length, (Luo Changpei & Wang Jun, 2002:124-127), which can be expressed as follows (length units are seconds):

|     | pitch | length |
|-----|-------|--------|
| Yin | 55    | 0.455  |
| Yang| 35    | 0.436  |
| Shang| 21[4] | 0.483  |
| Qu  | 51    | 0.425  |

Compared with the high level tone of Yin, the other three tones are clearly marked. In particular, compared with the Shang, the unmarkedness, stability and independence of Yin is stronger and Yin stays in the advantage while the Shang is the low level and its markedness, variability and the dependence of context are stronger, so it stays in a disadvantage (Shi Feng & Ran Qibin, 2011). The information of Yin is much greater than that of Shang (Liu Yongquan, 1980). Even in the entire tone system, Yin in Mandarin is also unmarked, when compared with Yang (middle rising tone), Shang (low falling-rising tone) and Qu (high falling tone), which corresponds to the nature of onomatopoeias: Trying
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to approximate the sound of the objective nature, Onomatopoeias are primitive words which are formed by the subjective human sounds. (See below)

3.4.2.2 Internal cause two: onomatopoeias are would-be words

Onomatopoeias are marginal members in the system of vocabulary and compared with other notional words, it is obviously deficient in the following parts.

(a) Representing sounds, onomatopoeias are not conceptualized or low in concept, so it is difficult to categorize them into functional words or notional words. In other words, Onomatopoeias have a high iconicity. The direct evidence is that dictionaries use different interpretations to paraphrase onomatopoeias and sound conceptual words. For example, *Modern Chinese Dictionary* paraphrases onomatopoeias in the form of “word class + example” or “word class + specifying object + example”. e.g. ᵇʰᵒⁿᵍ (轰, ’sound of thunder, cannon, or explosion’) in (1), ᵇʰᵒⁿᵍˡᵒⁿᵍ (轰隆, ’sound of thunder, cannon, explosion or a big machine’) in (2).

(1) ᵇᵘʳᵘⁿ ᵇʰᵒⁿᵍ ᵇᵉ ᵇᵉ ʸⁱ ᵇˢʰᵉⁿᵍ, ṭᵉⁿ ᵇᵉ ˢʰᵃⁿᵐᵉⁿᵍ-ᵍᵘʸⁱⁿᵍ.
   Suddenly boom PART a sound makes an echo PART mountains and valleys make noise
   (’Suddenly, a sound of boom makes an echo in the mountains and the valleys.’)

(2) ᵇʰᵒⁿᵍˡᵒⁿᵍ ᵇⁱ ᵇˢʰᵉⁿᵍ ᵇᵉ ʲᵘˣⁱᵃⁿᵍ, ᵇᵃⁿᵍᵉᵉ ḩᵃᵒᵗᵃ ᶱᵉʳᵃ ᶱᵉʳᵃ.
   boom a sound loud voice house collapsed down
   (’With a loud sound of boom, the house collapsed.’)

And it also uses “Limited Content + Example” to paraphrase the sound conceptual words. e.g. ʰᵉˢʰᵉⁿᵍ (歌声, ’sound of songs’) in (3)(4).

(3) ᵇᵘⁿˡᵉ ᵇᵉ ʰᵉˢʰᵉⁿᵍ
   Happy PART sound of songs
   (’happy singing’)

(4) ᵇᵉˢʰᵉⁿᵍ ᵇᵉ ˢⁱⁿˡᵉ
   sounds of singing rise from all directions
   (’Sounds of singing were heard from all around.’)

Wen Lian (1991) suggests that the sound of onomatopoeias is the stimulus of the first signal system and there is no agreement relationship, so it is not a linguistic symbol, but a transition from the first signal system to the second. Ma Qinghua (2013) further points out that onomatopoeias are “the first step from language to knowledge expression”. We believe that the concept, quantity and the using frequency of onomatopoeias are low. Onomatopoeias are morphological and lexical instability and far inferior to other parts of

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① Geng Erling (1994) refutes this by arguing that Onomatopoeia is also a language symbol, but the argument is not sufficient.
speech in lexicalization and grammaticalization, so they are would-be words with the highest iconicity and objectivity.

Additionally, the study on brain lateralization and the characteristics of tonal perception shows that the lateralization of the left hemisphere of the brain is an important prerequisite for human language ability. Tonal language learners mainly process tones in their left hemisphere, which deals with language, category, or at least the perception of the would-be category; the non-tonal language learners mainly process tones in the right hemisphere, which deals with nonverbal and psychophysical perception. The result of Binaural hearing test shows that falling-rising tone is processed in the left hemisphere, while the processing of level tone is not obvious in the left brain (Shuai Lan & Gong Tao, 2013). Since the perception of level tonal category is not obvious in the left brain, it should be perceived by the right brain, and main function of the right brain is to control the first signal system, which is consistent with onomatopoeias’ would-be nature.

(b) Small amount and very low frequency (Guo Rui, 2004:219).

(c) Lexical forms are diverse, showing extremely strong rhythmic features (Zhu Dexi, 1982; Wang Hongjun, 1999) and hyper-phonological, which indicates that onomatopoeias are low in lexicalization or have the lowest lexicalization as words.

(d) The syntactic distribution of onomatopoeias is ubiquitous and they can be any syntactic components, which indicate that onomatopoeia is a grammatical category with low grammaticalization or has the lowest grammaticalization, and even has no proprietary syntactic distribution of its own.

In short, compared with other tones, the Yinping tone is not marked. Compared with other parts of speech, the onomatopoeia, i.e. the would-be word, is really low in conceptualization, lexicalization and grammaticalization, but high in iconicity. The combination of the two is a perfect match for each other.

3.4.3 External causes

Since the Yuan Dynasty, Chinese northern dialect has influenced by the non-tonal Altai languages, which is the external reason why Chinese onomatopoeia is gradually unified in Yin (rather than other tones). The social influence, which is brought by the great unification in the Yuan Dynasty, moving the capital of Ming Dynasty and making Beijing the capital in Qing Dynasty, is big and profound.

The distribution of Altai languages ranges from the west starting from Turkey, via five Central Asian countries, reaching Mongolia and northern China, to the east from the vast regions of the Pacific, including Iran, Afghanistan and some countries in Eastern Europe. Thus Altai languages are geographically adjacent, interlaced, or mixed with Chinese northern dialect in the three directions of the west, north, and east. Historically, the Huns, Dangxiang, Wuhuan, Xianbei, Turks, Khitan, Jurchen, Mongolia and many other nationa-
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lities, who speak Altai languages, have lived and reproduced in this area. No later than the Northern Dynasty, the Han people begin to mix frequently with the ethnic groups, who speak Altai languages. The contact between Han and the other ethnic groups is frequent, including living together or being at wars, which are always alternating with each other. From the Northern and Southern Dynasties to the Tang Dynasty, the Altai ethnic groups also have moved into the Han region many times, and in the period of Song, Liao, Jin and Yuan Dynasties, Khitan, Jurchen and Mongolia successively settle in the central plains, while the Altai languages make more intensified influence and infiltration to the modern Chinese. In particular, the Yuan Dynasty dominates the central plains for more than 100 years, which makes Chinese sound Universal, and the Mongolian language has a more profound impact on Chinese in the Yuan Dynasty (more historical issues are involved here). Phonological system, including tone, though may not be necessarily the first one influenced, is still an important aspect that cannot be neglected. In this historical background, the weakening of pitch’s differentiating function in the northern dialect has become the overall situation (Qian Zengyi, 2002) as shown in the following five aspects.

(a) The number of tones in the northern dialects is decreasing (almost from 4 to 0): Most of the dialects have 4 tones; 184 counties/cities (12% of total) only have 3 tones (Zhang Shifang, 2000; Deng Wenjing, 2009; Jiao Liwei, 2003); There are also two tones in some dialects (such as Minqin dialect in Gansu, Hezhou dialect and Honggu dialect in Lanzhou); Most noteworthy is the Donggan language and Dongxiang language, which have almost lost their tones and completely changed the tones into light and strong accent, thus effectively differentiate meanings by light and strong accent instead of tones as other dialects (Hashimoto Bantarou, 2008).

(b) The words of certain semantic categories or grammatical categories are unified into a fixed tone. For example, the Mandarin has the following categories: (1) Monosyllabic kinship nouns, organ nouns, interrogative pronouns are mostly Shang or Yang. (2) Suffixes of adjectives (such as ABB pattern) are Yin. (3) Modal words, interjections, structural particles, tense auxiliaries, commonly used nouns of locality and tendency words and quantifier ge (个) are unified in the neutral-tone. (4) Prepositions, conjunctions are uniformly read as neutral-tone in language flow. (5) Affixes and would-be affixes are unified in the neutral-tone, which leads to the weakening or loss of the initials and vowels. (Wang Jue, 2012)

—For this, Hashimoto Bantarou (2008) has a good study.
—For Minqin dialect, See Nakajima (1985, quoted by Shi Feng & Liao Rongrong, 1994:135); For Hezhou dialect, see Zhang Shifang (2000); For Honggu dialect, see Luo Peng (1999), Zhang Wenxuan & Deng Wenjing (2010).
Multisyllabic words often have one or two syllables that are fixed neutral and their tones are attached only to the stressing syllable. Because “the change in the pitch has already played a very important role in the syllable for differentiating meanings, so in the resolution of the accent, the length change is predominant, and the role of pitch and length in language has a clear division” (Lin Tao, 1983). The last syllables of spoken nouns are weakened and become the movements of front-attached rolling tongue without tones.

In contemporary Chinese, the static monosyllabic words commonly used are only accounting for 11.6%, while the disyllable words are 74.3%, and the three or four-syllable words are 14.2% approximately (Li Rulong, 2009). Even regardless of pitch, words of three or four syllables almost absolutely have no homonyms, and most words of disyllables do not have homonyms, either. By contrast, only monosyllabic words (11.6% of total) need pitch to play a semantic function.

In comparison with medieval times, the number of paratactic disyllable words with same tones has nearly doubled in the contemporary Mandarin.

It is just on the basis of the above background that the tonal distribution pattern of onomatopoeias historically and gradually evolves into “Overwhelming Yin” in contemporary Mandarin.

3.5 Summary

Thus, the answer to the second half of puzzle three can be summed up as follows:

First of all, the tones gradually lose differentiated function in meanings because the syllable size and structure type of onomatopoeias are constantly increasing and diversifying, and the neutral tone attribute is incompatible with onomatopoeias, which makes onomatopoeias only move in the direction of level tone. Secondly, the combination of unmarked Yin and onomatopoeias (would-be words) is adaptive. Finally, with the long, continuous and strong influence of non-tonal languages, the semantic function of pitch in northern dialects is weakening. The interaction of these three factors finally made the onomatopoeia of Mandarin gradually evolve into the “Overwhelming Yin”.

4. Unfinished comments

Through the preliminary investigation of the diachronic evolution of the tonal distribution pattern, syllable size and structure type of onomatopoeias in Chinese, the paper aims to provide the keys that unlock the three puzzles. Here four more points are to be added.

Chen Aiwen & Yu Ping (1979) study and find that the contemporary Chinese has 525 paratactic disyllable words, in which there are 80 words (approx. 15.2%) with same tones according to middle ancient tonal system, while there are 145 words (approx. 27.6%) according to the contemporary tonal system.
Three Puzzles of the Dominant Yinping Tone in Mandarin Onomatopoeias

First, Mandarin onomatopoeias all are Yin, which means that all members of onomatopoeias are not different in tones, or in Mandarin, the tones of onomatopoeias lose their value in meaning differentiation, “and mainly play the role of background, which is the contrastive frame of the loudness of onomatopoeias between their initials and vowels” (Ying Xuefeng, 2012). It’s only one step away from losing tones.

Second, in the history of Chinese phonetics, the appearance of the neutral-tone marks a crucial step towards the loss of tones in the northern dialect nearly one thousand years ago. Yin gradually dominates the entire membership of onomatopoeias, which began nearly one thousand years ago, marking another critical step towards the loss of tones in the northern dialect. These two forces have jointly promoted the reduction of the tones of most northern dialects to three tones, some dialects to two tones and even the entire loss of the tones in some dialects and are compensated with accent, length and retroflex suffixation.° Maybe we should be bold enough to prospect in the future that the weakening or even decreasing of tonal function in northern dialects will speed up, and “which may end up with their loss (Li Baojia, 2002:353).”

Third, in terms of the language phenomena, like the unification of onomatopoeia in Yin, Peng Zerun (2006) proposes the concept of “words’ tonal pattern”, which means “the tone of the whole syllable(s) or part syllable(s) of a word is fixed to read high, low or weak, as a phonetic phenomenon with the contrast both in pitch and accent, there is no phonetic condition to form it. The morpheme in the tonal pattern is modeled regardless of whether it is used singly or expressed in other words, regardless of phonetic condition neither.” Although the “Overwhelming Yin” of onomatopoeias can be categorized into this tonal pattern concept, onomatopoeias are obviously higher, more thorough and more absolute. The reasons are as follows.

(a) The tonal pattern of words is a fixed modulation, and a modal phonetic variation of morphemes, and they have their own original tones. However, the tone of onomatopoeias in Mandarin is Yin, which is the only way to read, and it is not the general meaning of the language flow, nor a phonetic pattern of morpheme, nor even an original tone exists.

(b) The tonal pattern of words is not directly related to the semantic and grammatical classes of the words, but all the members of onomatopoeias in Mandarin are Yin, which are in the same semantic class and the grammatical class. This is the same kind of historical

° Chen Baoya (2006) indicates: The Chinese dialects have played a great role in the interference of national language in the process of formation. These disturbances inevitably give Chinese dialects some structural factors that do not exist in the original Chinese language.

° The tonal languages occupy 60-70% of natural languages, most of which develop from non-tonal languages, while some other non-tonal languages develop from tonal languages. As far as I know, some of the Niger-Kordofan languages, Chinese Donggan dialect and Dongxiang and the other languages have been or are evolving into non-tonal languages.
phonetic variation as the reading lightly and softly in some parts of speech (modal words, interjections, structural auxiliaries, tense auxiliaries, commonly used nouns of locality and tendency words and individual quantifiers, prepositions, conjunctions) in Chinese.

(c) The tonal pattern of words is a historical formation, which is generally the result of the multisyllabication of words, while onomatopoeia of Yin in Mandarin is historically formed, but it involves more and more complicated factors.

Forth, the 14th International linguists’ Congress once proposed the “Investigation of Onomatopoeia” as one of the 20 most important issues in 1987. However, 37 years have passed, attention has not yet been paid enough to the study on onomatopoeias in Chinese. Consequently, the study on the tone of onomatopoeias in Chinese dialects is even weaker, and the description and interpretation of their tonal distribution and diachronic evolution are almost blank.\(^1\) We believe that the study on the tonal distribution pattern and diachronic evolution of onomatopoeias must be of great linguistic significance that has never been revealed by the predecessors.

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\(^1\) We are pleased to see that Gao Yonghan (2007), Wang Xiaojun (2007) have made a study of ice-breaking significance in this area.
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