

Tonal Prosody in Recent-style Verse of the Early Tang: From a
Statistical Perspective

By

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This dissertation is dedicated to
my family

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Abstract

The Tang dynasty (618-907) is regarded as the golden age in Chinese civilization during which time the Recent-style verse *jintishi* 近體詩, also known as Regulated verse *gelüshi* 格律詩, was consummated. As a brilliant achievement in the history of Chinese literature, Recent-style verse has been studied by a number of scholars from various perspectives in the fields of literature, linguistics, philology, translatology, history, folklore, etc. This dissertation will focus on the tonal prosody in Recent-style verse from the perspective of linguistics.

Recent-style verse is highly regulated, and it requires poets to follow a set of rules. Among those rules, tonal prosody is the most complex one, which has not been fully understood. For the most essential questions about tonal prosody, including (a) what the tonal patterns of Recent-style verse are, (b) what the critical features of the tonal prosody in Recent-style verse are, and (c) how the tonal prosody in Recent-style verse was developed throughout the history, we have not yet had satisfactory answers.

To solve those problems, this dissertation thoroughly analyzes the pentasyllabic poems written by some representative poets in the early Tang dynasty (618-712). By employing statistical tests, this dissertation will figure out the features and rules of the tonal prosody in the early Tang period and compare them with those of pre-Tang eras, especially the Yongming 永明 Era (483-493), and answer how Chinese poetic prosody was

developed throughout history.

This dissertation contains seven chapters. Chapter 1 is the introduction, which briefly summarizes the investigation of the tonal prosody of the Recent-style verse and its origin in the previous works, reviews the different approaches used in the field of Chinese poetic study, and discusses the research objectives of this study. Chapter 2 introduces the methodology and the statistical tests applied in this study. By employing the chi-square tests, Chapters 3, 4 and 5 respectively investigate the tonal distributions and the pair-wise tonal contrasts from the Yongming style verse to the Recent-style verse, and a special type of tonal pattern of the Recent-style verse. Chapter 6 examines the correlation between syntactic structures and the metrical structures and discusses the nature of Chinese poetic prosody. The last chapter summarizes the findings and conclusions drawn in this dissertation. It is my hope that this dissertation can not only introduce a new approach into the studies of the Recent-style verse and reveal the features of Chinese poetic prosody, but also shed a new light on the research of poetic meters cross-linguistically.

Chapter 1. Introduction

1.1 Tonal Prosody of the Recent-style Verse

The Tang dynasty (618-907) is regarded as the heyday of Chinese poetry during which time the Recent-style verse *jintishi* 近體詩, also known as Regulated verse *gelüshi* 格律詩, was consummated. The Recent-style verse is highly regulated and requires “a mandatory implementation of syntactic, structural, and tonal regulations” (Cai, 2008: 161). The Recent-style verse can be divided into three subcategories based on the number of lines: *lüshi* 律詩 which contains 8 lines, *jueju* 絕句 which contains 4 lines, and *pailü* 排律 or *changlü* 長律 that contains more than eight lines. Every two lines form a couplet *lian* 聯, where the first line is called the upper line *shanglian* 上聯 and the second line is called the bottom line *xialian* 下聯. In a Recent-style poem, the number of syllables within a line must be identical, either five or seven, and the rhyme that is used at the end of every couplet should be the same. Rhyme should also occur at the end of the first line if the fifth syllable has a *ping* tone.

The most complex regulation is tonal patterning. The Middle Chinese, also called Ancient Chinese, has four tones, the level tone *ping* 平, the rising tone *shang* 上, the departing tone *qu* 去, and the entering tone *ru* 入. When composing Recent-style verse, the four tones will be divided into two contrasting categories, *ping* (level) (represented by

“-”) and *ze* 仄 (oblique or deflected) (represented by “/”) which contains *shang*, *qu*, and *ru*. A maximum contrast of *ping* and *ze* is required within a line. Therefore, “the tones of a pentasyllabic line must appear in two opposite pairs, a pair of level tones and a pair of oblique tones, with an odd (“-” or “/”) tipping the balance” (Cai, 2008: 169). And for most of the Recent-style verse, the rhyming syllable, which is the last syllable of a couplet, is *ping* tone. Hence, there are four basic tonal patterns of a pentasyllabic line (Wang, 1958: 74):

(1) Four basic tonal patterns of a line

| | Pentasyllabic line | Heptasyllabic line |
|--------|--------------------|--------------------|
| Type a | / / - - / | - - / / - - / |
| Type A | / / / - - | - - / / / - - |
| Type b | - - - / / | / / - - - / / |
| Type B | - - / / - | / / - - / / - |

To form the basic tonal patterns of a heptasyllabic line, one can simply add a pair of level tones to the beginning of Type a or Type A and add a pair of oblique tones to the beginning of Type b or Type B.

Between lines, there are other rules namely *dui* 對 and *nian* 黏. *Dui* requires the tonal pattern of the upper line should be in contrast with that of the bottom line in a couplet. *Nian*

“stipulates a correspondence in tone between the first two words in the closing line (the bottom line) of a couplet and those in the opening line (the upper line) of the next couplet” (Cai, 2008: 170). But these adjacent two lines cannot be the same¹. Therefore, based on these principles, canonical tonal patterns of a complete poem are shown as follows.

(2) Canonical tonal patterns of a Recent-style poem

| Style 1 | Pentasyllabic Verse | Heptasyllabic Verse |
|---------|---------------------|---------------------|
| | — — — // | // — — // — |
| | /// — — | — — /// — — |
| | // — — / | — — // — — / |
| | — — // — | // — — // — |
| | — — — // | // — — // — |
| | /// — — | — — /// — — |
| | // — — / | — — // — — / |
| | — — // — | // — — // — |
| Style 2 | Pentasyllabic Verse | Heptasyllabic Verse |
| | — — // — | // — — // — |
| | // — — / | — — // — — / |
| | /// — — | — — /// — — |

¹ The tonal patterns of *jueju* and *pailü* should also follow these rules.

| | | |
|----------------|----------------------------|----------------------------|
| | — — — // | // — — // — |
| | — — // — | // — — // — |
| | // — — / | — — // — — / |
| | /// — — | — — /// — — |
| | — — — // | // — — // — |
| Style 3 | Pentasyllabic Verse | Heptasyllabic Verse |
| | // — — / | — — // — — / |
| | — — // — | // — — // — |
| | — — — // | // — — — // |
| | /// — — | — — /// — — |
| | // — — / | — — // — — / |
| | — — // — | // — — // — |
| | — — — // | // — — — // |
| | /// — — | — — /// — — |
| Style 4 | Pentasyllabic Verse | Heptasyllabic Verse |
| | /// — — | — — /// — — |
| | — — — // | // — — — // |
| | — — // — | // — — // — |
| | // — — / | — — // — — / |
| | /// — — | — — /// — — |

| | |
|----------|--------------|
| — — — // | // — — — // |
| — — // — | // — — // — |
| // — — / | — — // — — / |

Despite the canonical tonal patterns mentioned above, however, the actual tonal patterns presented in the Tang poets' works are much more complex. Duanmu and Stiennon (2005) examined all heptasyllabic regulated poems in the anthology of *Three Hundred Tang Poems* and found that only 32% of the lines and 1% of the poems perfectly meet the canonical patterns. There are many variations permitted by so-called "1-3-5 rule"² (Duanmu & Stiennon, 2005: 4) which means the tonal category of the first, the third, and the fifth syllables in a heptasyllabic line is free. They can be either *ping* or *ze*. The same applies to the first and the third syllables in a pentasyllabic line.

Wang (1958: 85-94) discussed this "1-3-5 rule" in detail and pointed out that this catchy rule of unknown authorship does not match the facts. There are constraints on the application of this rule. As for pentasyllabic lines, the tonal category of the first syllable in Type a, A, and b can be free. By contrast, in Type B, the first syllable cannot be changed from *ping* to *ze*. That is, "- - // -" cannot be changed to "/ - // -", otherwise, there will be only one *ping* syllable in the line except for the last syllable in the rhyming position, which is called *guping* 孤平 (lone *ping*) and should be avoided. Moreover, variations from the

² In Chinese, it is 一三五不論, 二四六分明.

canonical patterns is called *ao* 拗 (violation). For example, canonical Type a pattern is “/ / - - /”. If we change the third syllable from *ping* to *ze*, then the pattern becomes “/ / / - /”, in which the third syllable is called *ao*. Since some of the positions are free, for example, the first syllables in pentasyllabic Type a, A, and B, there is no way to violate the rule in these positions. Traditionally, the changes in the following positions are called *ao*: the second, the fourth, the fifth, and the sixth syllables in heptasyllabic lines, the second, the third, and the fourth syllables in pentasyllabic lines, the third syllables in heptasyllabic Type B, and the first syllables in pentasyllabic Type B.

Wang (1958: 93) extended the meaning of *ao* to any changes of canonical patterns. He classified three different categories of *ao*. The first one includes the first syllables of any heptasyllabic lines, the first syllables of pentasyllabic lines, and the third syllables of heptasyllabic lines in Type A, a and b. The second includes the third syllables in pentasyllabic lines and the fifth syllables in heptasyllabic lines. The third category includes the first syllables of pentasyllabic lines and the third syllables of heptasyllabic lines in Type B. If poets change the tonal category of a certain syllable in any above-mentioned position, they can compensate for the violation by changing the tonal categories of the first or third syllables within the same lines or in the other lines within the same couplets. This is called *jiu* 救 (save). In the first category of *ao*, the syllables in those positions are comparatively less restricted. Thus, it does not matter whether or not to “save” those syllables. As for pentasyllabic lines, if poets choose not to “save” the changed syllables, then the patterns

will be shown as follows.

(3)

| Canonical Patterns | Variations |
|--------------------|---------------------|
| Type a / / - - / | Type a-V1 - / - - / |
| Type A / / / - - | Type A-V1 - / / - - |
| Type b - - - / / | Type b-V1 / - - / / |

If poets choose to “save” the changed syllables, they will change the tonal categories of the first syllables in the other lines within the same couplets, as can be seen in Table (4).

(4)

| Canonical Couplets | Variations |
|--------------------|----------------------------|
| Type a / / - - / | Type a-V1 - / - - / |
| Type B - - / / - | Type B-V1 / - / / - |
| Type A / / / - - | Type A-V1 - / / - - |
| Type B - - / / - | Type B-V1 / - / / - |
| Type b - - - / / | Type b-V1 / - - / / |
| Type A / / / - - | Type A-V1 - / / - - |

As mentioned above, Type B-V1 has only one *ping* syllable except for the last syllable in the rhyming position, which should be avoided. Actually, Type B-V1 is very rare in Recent-style verse.

For the second category of *ao*, poets should “save” them by changing the third syllables in the other lines within the same couplets, as shown in Table (5).

(5)

| Canonical Couplets | Variations |
|---------------------|----------------------------|
| Type a / / - - / | Type a-V2 / / / - / |
| Type B - - / / - | Type B-V2 - - - / - |
| Type b - - - / / | Type b-V2 - - / / / |
| Type A / / / - - | Type A-V2 / / - - - |

Because Type A-V2 has three consecutive *ping* tone at the end, which is a commonly used pattern in the Old-style verse *gutishi* 古體詩, poets will avoid to use this pattern in Recent-style verse.

For the last category of *ao*, poets must “save” them by changing the third syllables within the same lines, as in Table (6).

(6)

| Canonical Patterns | Variations |
|-----------------------------|-------------------------------|
| Type B - - / / - | Type B-V3 / - - / - |

Wang (1958: 94-103) listed some major methods of *aojiu* 拗救 (saving the violation).

But in actual corpus of the Recent-style verse, the patterns are more than 4 canonical patterns and 7 variations because poets can sometimes change two syllables at the same time and there are also lots of irregular patterns. Wang (1958: 103-116) listed some special variations of Type b, a, and B as shown in Table (7).

(7)

| Canonical Patterns or Couplets | Variations |
|--------------------------------|-------------------------------|
| Type b - - - / / | Type b-V3 - - / - / |
| Type a / / - - / | Type a-V3 / / - / / |
| Type B - - / / - | Type B-V4 - - - / - |
| Type a / / - - / | Type a-V3 / / - / / |
| Type B - - / / - | Type B-V5 / - - / - |

Wang's (1958) book is one of the most important and fundamental works of Chinese poetic studies in the modern times which introduces some key concepts and theories and

gives a detailed analysis and a lot of examples of tonal patterns in the Recent-style verse. However, his research method has several shortcomings. First of all, he proposed four canonical patterns but only 32% of the heptasyllabic lines in *Three Hundred Tang Poems* use these canonical patterns (Duanmu & Stiennon, 2005). If the four patterns are the most important or basic patterns, why is the ratio of these patterns so low? If there are so many, about 70%, variations, then what is the purpose to set the canonical patterns? These canonical patterns can't help us understand the nature of the tonal prosody of the Recent-style verse. Second, although Wang's work listed almost all the variations and tried to provide a complete picture of all the possible tonal patterns, the descriptions about the frequency of the patterns, such as "very common" and "not uncommon", are very vague. Third, theoretically, the tonal patterns of the Recent-style verse and those of the Old-style verse should be different. However, some Recent-style tonal patterns could be the same as Old-style tonal patterns after *ao* and *jiu*. Therefore, a more in-depth analysis of the tonal prosody it is still necessary.

1.2 The Origin of Poetic Tonal Prosody

The Tang dynasty is the golden age of this highly regulated verse while the creation of the tonal prosody, which is the fundamental feature of Recent-style poetry, can date back to centuries ago, the Yongming 永明 era (483-493) in the Qi dynasty (479-502). Before

the Yongming era, the Chinese poetic genre had been developed for over a millennium, leaving numerous classics, such as Book of Songs *Shijing* 詩經, the Music Bureau's poems *yuefushi* 樂府詩, and “Nineteen Old Poems” *gushi shijiushou* 古詩十九首. The metrical techniques used in pre-Yongming poems mainly focus on the segmental level, such as rhyme, alliteration, assonance, etc. While during the Yongming era, requirements of tone arrangements in versification gradually took shape, which made it distinctive from the poetry in the previous period, and later it was carried forward in the Tang dynasty. The prerequisite of the poetic tonal prosody was the discovery of the four tones, namely *ping*, *shang*, *qu*, and *ru*. A group of Yongming literati represented by Shen Yue 沈約 (441-513), Wang Rong 王融 (476-493), and Xie Tiao 謝朓 (464-499) was credited with the discovery of the four tones and based on it, they created unique poetic tonal prosody. This was recorded in many historical documents, with two examples given in (8).

(8) Historical records of the four tones

《南齊書》陸厥傳：

永明末，盛為文章。吳興沈約、陳郡謝朓、琅邪王融以氣類相推轂。汝南周顒善識聲韻。約等文皆用宮商，以平上去入為四聲，以此制韻，不可增減，世呼為永明體。

“Lu Jue zhuan” (The biography of Lu Jue) in *Nanqi shu* (The History of Southern Qi)

At the end of the Yongming era, literary writings flourished. Shen Yue from Wuxing, Xie Tiao from Chenjun, and Wang Rong from Langya³ commended and recommended each other because of the similar [literary] style. Zhou Yong from Runan was proficient in tonal prosody. The poems of Shen Yue and the others all used tonal metrics. [They] took *ping*, *shang*, *qu*, and *ru* as the four tones, based on which they created prosody. [The prosody] did not allowed addition or reduction. The world called it the Yongming style.

《梁書》沈約傳

又撰四聲譜，以為在昔詞人，累千載而不寤，而獨得胸衿，窮其妙旨，自謂入神之作，高祖雅不好焉。帝問周捨曰：“何謂四聲？”捨曰：“天子聖哲”是也，然帝竟不遵用。

“Shen Yue zhuan” (The biography of Shen Yue) in *Liang shu* (The History of Liang)

[Shen Yue] also wrote *Register of the Four Tones*. He thought the literati in the past were unaware of [the four tones] for thousands of years, while only he had the aspiration and thoroughly investigated its subtle purport. He claimed [the book] was a divine work. The founding emperor was gracious and did not like it. The emperor asked Zhou She, “What are called the four tones?” Zhou She said, “[They

³ Wuxing is located in current Huzhou city in Zhejiang province. Chenjun is located in current Zhoukou city in Henan province. Langya is located in current Linyi city in Shandong province. Runan is located in current Runan county in Henan province. See Tan Qixiang 譚其驤, *Zhongguo lishi dituji* 中國歷史地圖集 [The Historical Atlas of China] (Shanghai: Ditu chubanshe, 1982), vol 4: 27-28.

are that] heaven’s son is sage and wise⁴.” However, the emperor eventually did not follow and use [them].

Although scholars reached a consensus that the literati in the Yongming era discovered the four tones of Middle Chinese and created poetic tonal prosody based on it, it remains unclear what the detailed contents of the Yongming-style tonal prosody are. Many ancient and modern scholars also take Shen Yue as the authorship of a concept called *babing* 八病 (eight defects) and consider it as the poetic prosody that Yongming poets created. The eight defects are *pingtou* 平頭 (level head), *shangwei* 上尾 (rising tail), *fengyao* 蜂腰 (wasp’s waist), *hexi* 鶴膝 (crane’s knee), *dayun* 大韻 (major rhyme), *xiaoyun* 小韻 (minor rhyme), *pangniu* 旁紐 (lateral ligature), and *zhengniu* 正紐 (frontal ligature). The first four defects regulate the tonal arrangement, and the rest regulates the arrangement of initials and rhymes. *Bunkyō hifuron* 文鏡秘府論, a book on Chinese poetic theory composed around the early ninth century by Japanese monk Kūkai (774-835), records and explains 28 defects of poetry writing in which the eight defects are included. The following lists the four defects concerning tonal prosody.

⁴ The four characters, *tian* 天 (heaven), *zi* 子 (son), *sheng* 聖 (sage), and *zhe* 哲 (wise), respectively have *ping* tone, *shang* tone, *qu* tone, and *ru* tone in Middle Chinese.

(9) Defects on tonal prosody in *Bunkyo hifuron*

平頭詩者，五言詩第一字不得與第六字同聲，第二字不得與第七字同聲。

上尾詩者，五言詩中，第五字不得與第十字同聲，名為上尾。

蜂腰詩者，五言詩一句之中，第二字不得與第五字同聲。

鶴膝詩者，五言詩第五字不得與第十五字同聲。

Pingtou requires that in pentasyllabic poems, the first syllable and the sixth syllable have different tones; and the second syllable and the seventh syllable have different tones.

Shangwei requires that in pentasyllabic poems, the fifth syllable and the tenth syllable have different tones.

Fengyao requires that in pentasyllabic poems, the second syllable and the fifth syllable within a line have different tones.

Hexi requires that in pentasyllabic poems, the fifth syllable and the fifteenth syllable have different tones.

Many scholars claim Shen Yue created the concept *babing*, which is recorded in many ancient and modern documents.

(10) Statements on Shen Yue's authorship of *babing*

《南史》陸厥傳

約等文皆用宮商，將平上去入四聲，以此制韻，有平頭、上尾、蜂腰、鶴膝。

“Lu Jue zhuan” (The biography of Lu Jue) in *Nan shi* (The History of the Southern Dynasties)

The poems of Shen Yue and the others all used tonal metrics. [They] took *ping*, *shang*, *qu*, and *ru* as the four tones, based on which they created prosody. There were *pingtou*, *shangwei*, *fengyao*, and *hexi*.

《困學紀聞》

按《詩苑類格》沈約曰：“詩病有八。平頭、上尾、蜂腰、鶴膝、大韻、小韻、旁紐、正紐。唯上尾、鶴膝最忌，餘病亦通。”

Kunxue jiwen (Notes of Study During Hard Times)

According to *Shiyuan leige* (The Categories and Styles of Poetry), Shen Yue said, “There are eight defects of poetry writing. [They are] *pingtou*, *shangwei*, *fengyao*, *hexi*, *dayun*, *xiaoyun*, *pangniu*, and *zhengniu*. Only *shangwei* and *hexi* are the most impermissible. The rest defects are also acceptable.”

沈約在周顒發現漢語平、上、去、入四聲之後，撰《四聲譜》，提倡在詩歌創作中運用四聲調諧韻律，避忌“八病”⁵。

⁵ Du Xiaoqin 杜曉勤, “Datong lvju xingcheng guocheng ji yu wuyanshi danju yunlv jiegou bianhua zhi guanxi” 大同句律形成過程及與五言詩單句韻律結構變化之關係 [The formation of the tonal pattern and the prosodic transformation of the pentasyllabic line during the Datong Reign (535 -546) of the Liang], *Lingnan Journal of Chinese Studies*, (2016), vol. 5, 137.

After Zhou Yong discovered the four tones *ping*, *shang*, *qu*, and *ru* in Chinese, Shen Yue wrote *Register of the Four Tones*, advocating manipulating the prosody by the use of the four tones in poetry writing and avoiding the “eight defects”.

However, if we take Shen Yue as the inventor of the concept *babing*, we will face a paradox that Shen Yue often violated the tonal prosody rules that were proposed by himself. Here are some examples.

(11) Shen Yue’s pomes that violate *babing* (Zhang, 2015: 352)

a. 《送別友人》

浮雲一南北，何由展言宴 (Lu, 1983: 1635)

“Escorting and Parting from a Friend”

The floating clouds will form [a barrier] from south to north;

How can we ever talk or feast again together? (Mather, 2003: 158)

b. 《和劉中書仙詩》

殊庭不可及，風燹多異色 (Lu, 1983: 1660)

“Harmonizing with a Poem on Transcendence by Clerk of the Central Secretariat Liu [Hui]”

The Special Courtyard is unreachable;

Its wind-blown flames are full of otherworldly tints. (Mather, 2003: 257)

c. 《詠箏》

徒聞音繞梁，甯知顏如玉 (Lu, 1983: 1656)

“Singing of the Twelve-stringed Zither”

One only hears their echoes winding round the beams;

How could one know [the player’s] face is beautiful as jade? (Mather, 2003:

125)

d. 《詠雪應令》

思鳥聚寒蘆，蒼雲軫暮色，夜雪合且離，曉風驚複息 (Lu, 1983: 1645)

“Singing of the Snow: In Response to a Command”

Longing birds have gathered in the chilly reeds,

As darkling clouds roll into shades of dusk.

In the night snow they huddle close or perch apart;

With dawn winds they fly up alarmed, then sink to rest. (Mather, 2003: 139)

The pomes in (11) respectively violate the rules of *pingtou*, *shangwei*, *fengyao*, and *hexi*. Takaki (1956) discussed the formation of the poetic prosody in the Six dynasties, and according to him (1956: 333), 21% of Shen Yue’s poems violate *hexi*. It is hard to be convinced that Shen Yue created the rule of *hexi* while about one-fifth of his poems didn’t follow the rule that he proposed by himself. Song & Zhang (2015) also questioned the statement that Shen Yue created the “eight defects”. They examined extant historical

documents where the “eight defects” occur and concluded that “no reliable pre-Tang source pinpoints Shen Yue as the originator of the theory” (Song & Zhang, 2015: 25). Siu (2015) studied the origin of Chinese poetic prosody and argued that the “eight defects” may be originated from different sources (Siu, 2015: 3). To conclude, whether Shen Yue proposed the concept of the “eight defects” remains controversial.

1.3 Different Approaches used in Chinese Poetry Studies

1.3.1 Generative approach

One ultimate goal shared by poetic meter studies of all different languages is to establish a series of theories that can create perfect templates and explain deviations from the perfect templates. Under the framework of the generative phonology, a group of prosodists (e.g., Halle & Keyser 1966, 1971, Kiparsky 1977, Hayes 1989, Fabb & Halle 2008, among others) proposed several approaches to address the issues about the stress mismatch in English verse. Take iambic pentameter as an example, whose metrical principles are stated as follows (Halle & Keyser 1966: 189).

(12) Metrical principles of iambic pentameter

- 1) The iambic pentameter line consists of five feet to which may be appended one or two extra-metrical unstressed syllables.

- 2) The iambic foot consists of two syllables.
- 3) Each even syllable is strongly stressed.
- 4) Each odd syllable is less strongly stressed.

However, the above principles are so strict that even the greatest poet often failed to follow them. Halle & Keyser (1966: 190) listed the opening couplet of Shakespeare's XXXth sonnet as a counterexample to the strict iambic meter.

(13) Example of Shakespeare's XXXth sonnet

When to the sessions of sweet, silent thought

Strict template: x X x X x X x X x X

I summon up remembrance of things past

Strict template: x X x X x X x X x X

According to the principles listed in (12), a strict template should be xXxXxXxXxX, where x stands for an unstressed syllable and X for a stressed syllable. When comparing the strict template with the example in (13), we find that underlined preposition words *to*, *of*, and *up* take stressed positions, which violates the stress rules of spoken English that a function word followed by a lexical word within the same syntactic phrase standardly appears in weak form (Selkirk 1996: 195).

To explain the deviations and to determine what is extra-metrical and what is unmetrical, prosodists propose some supplementary rules to the strict template. Halle & Keyser (1966: 197) proposed their theory for iambic pentameter, which is shown in (14).

(14) Halle & Keyser's principles for iambic pentameter

Principle 1 - The iambic pentameter verse consists of ten positions to which may be appended one or two extra-metrical syllables.

Principle 2 - A position is normally occupied by a single syllable, but under certain conditions it may be occupied by more than one syllable or by none.

Condition 1 - Two vowels may constitute a single position provided that they adjoin, or are separated by a liquid or nasal or by a word boundary which may be followed by *h*-, and provided that one of them is a weakly stressed or unstressed vowel.

Condition 2 - An unstressed or weakly stressed monosyllabic word may constitute a single metrical position with a preceding stressed or unstressed syllable.

Principle 3 - A stress maximum may only occupy even positions within a verse, but not every position need be so occupied.

Definition - A stress maximum is constituted by a syllable bearing linguistically determined stress that is greater than that of the

two syllables adjacent to it in the same verse.

On the basis of the above principles, Halle & Keyser (1971: 169) proposed correspondence rules in (15), later called metrical rules, to illustrate the deviations from strict patterns, and they also proposed a measure of the degree of deviation from the strict patterns.

(15) Correspondence rules

CR1 a. A position corresponds to a single syllable.

or b. A position corresponds to a sonorant sequence incorporating at most two vowels (immediately adjoining or separated by a sonorant consonant).

Definition - When a fully stressed syllable occurs between two unstressed syllables in the same syntactic constituent within a line of verse, this syllable is called a 'stress maximum'.

CR2 a. Fully stressed syllables occur in Strong (S) positions only and in all S positions.

or b. Fully stressed syllables occur in S positions only but not in all S positions.

or c. Stress maxima occur in S positions only but not in all S positions.

CR1a and CR2a are perfect cases that follow the strict template. CR1b allows two syllables to take one position. CR2b allows an unstressed syllable to take a metrically strong position.

CR2c allows a stressed syllable which is not a stress maximum to take a metrically weak position. A fully stressed syllable refers to the syllable that takes the stress of a polysyllabic word or the monosyllabic lexical word. Let's reexamine the first line in (13) according to correspondence rules.

(16) Reexamining the first line of Shakespeare's XXXth sonnet

When to the sessions of sweet, silent thought

Strict template: x X x X x X x X x X

Actual template: X x x X x x X X x X

Syllable number: 1 2 3 4 5 6 7 8 9 10

According to correspondence rules, the first syllable is allowed under CR2c; the second syllable is allowed under CR2b; the sixth syllable is allowed under CR2b; and the seventh syllable is allowed under CR2c. The number of the positions that deviate from CR1a and/or CR2a serves as the measure of the degree of deviation from the perfect forms, also known as metrical tension or complexity. In (16), there are four positions deviating from the perfect forms and thus the complexity is 4. Generally speaking, the lines with higher complexity occur less frequently.

Such approach was applied to the metrical studies of Chinese Recent-style verse by Chen (1979, 1980), Yip (1980), Duanmu (2004), among others. Chen (1979) claimed that

similar to English verse, Chinese Recent-style verse also has metrical feet. But what differs from English verse is that the foot of Chinese Recent-style verse is based on tones. According to Chen (1979: 382), the tone values *ping* (P) or *ze* (Z) are assigned to the metrical feet, instead of syllables; and syllables of the same metrical foot share the same tone values. He proposed four principles of the meter of Chinese Recent-style verse (Chen 1979: 382-383).

(17) Principles of the meter of Chinese Recent-style verse

a. Hierarchical Structure

A metrical line is hierarchically structured with exclusively binary branchings.

The second half-line can be either right-(R) or left-(L) branching.

b. Tone Assignment

Opposite tones (T and T') are assigned to sister constituents down to the level of the metrical foot in this fashion:



c. Tone Specification

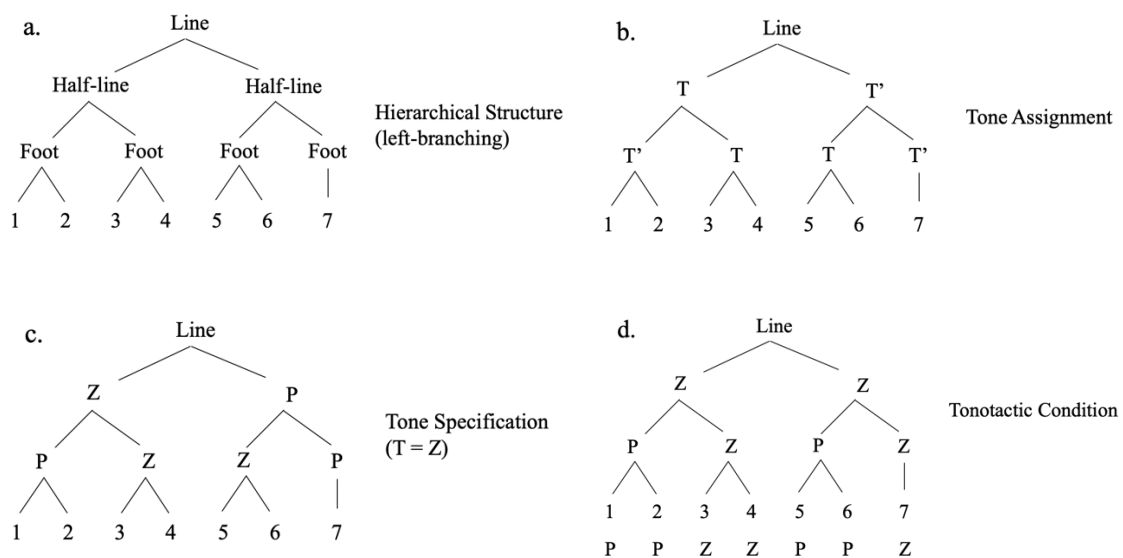
T may assume the value of either P or Z, and T' is opposite to T, subject to the Tonotactic Condition.

d. Tonotactic Condition

If Tone Assignment produces four consecutive syllables carrying an identical tone, the tones of the second half-line undergo alpha-switching (P to Z, and vice versa).

A canonical pattern of Recent-style verse, PPZZPPZ, is evolved as follows from Step a to d according to Chen's principles (1979: 385-386).

(18) Evolution of pattern PPZZPPZ under Chen's theory



Besides the regulations of the tonal assignment within a line, Recent-style verse also has some rules that regulate the tones of adjacent lines, which is formulated by Chen (1979: 387) as follows.

(19) Tonal principle of adjacent lines

Line Sequencing

Two adjacent lines must share one of the two variables (P/Z and R/L) and differ in the other; the former variable (P/Z) is the first to change every other line.

An example of how the line sequencing theory is applied is shown in (20) (Chen 1979: 387).

(20) Example of the line sequencing theory

| | |
|------------------|--------|
| 1. / / - - - / / | [PR |
| 2. - - / / / - - | |
| 3. - - / / - - / | [ZL] |
| 4. / / - - / / - | |
| 5. / / - - - / / | [PR] |
| 6. - - / / / - - | |
| 7. - - / / - - / | [ZL] |
| 8. / / - - / / - | |

Chen (1979) and Yip (1980) claimed that the metrical feet of Chinese Recent-style verse are iambic because the choice for tones in even-numbered syllables is more rigid than that in odd-numbered syllables according to ‘1-3-5 rule’ and even-numbered syllables are read with longer duration in recitation. However, Duanmu (2004) held the opposite view that the feet of Chinese Recent-style verse are trochaic. The template of Recent-style verse he proposed is given in (21) (Duanmu 2004: 55).

(21) Template for Chinese Recent-style verse proposed by Duanmu (2004)

- a. Pentasyllabic lines: SWSWSØ
- b. Heptasyllabic lines: SWSWSWSØ

Ø stands for an empty beat or rest and takes a weak position at the end of each line. Duanmu argued that, with the empty beat, the templates contain binary feet only and the last syllables take a strong position in agreement with the fact that rhyming syllables should be stressed. Another observation Duanmu (2004) made on the basis of his analysis of 1460 Recent-style verse lines is that there is no clear correlation between metrical tension and frequency in his corpus, which is contradictory to Chen's (1979) prediction. He argued that it is non-phonological factors that affect frequency patterns.

It is noteworthy that metrical rules were first developed to explain the poetic meter of stress languages like English, which aim to reflect the binary contrast of the suprasegmental features that is stress versus unstress. However, Middle Chinese is a tonal language with four tones. There is no ready-made binary contrast at the suprasegmental level in Middle Chinese that poets can use to create a poetic meter. Literati around early Tang period divided the four tones into two tonal categories, the reason for which is unclear, and then Recent-style meter was created. However, the metrical patterns proposed by generative prosodists cannot directly match the *ping-ze* contrast meter at the surface level. And the meters they proposed, whether iambic or trochaic, share a presumption that Middle Chinese

has stress at the lexical and phrasal levels. Whether modern Chinese and Middle Chinese have stress at the lexical and phrasal levels is a controversial issue. Many scholars claim that there is no compelling empirical evidence to support the metrical structure in both modern Chinese and Middle Chinese (Hoa 1983: 7, Bao 2003: 157, Shi 2008: 166, Zhang 2014: 309, among others), which makes the metrical analyses on Chinese Recent-style verse in previous studies somewhat untenable.

1.3.2 Quantitative approach

The quantitative methods are often used in the diachronic studies of Chinese poetry and its history can date back to the middle of the last century. By calculating the violation of certain rules or the occurrence of certain tonal patterns in a collection of a certain poet, and comparing collections of different poets chronologically, researchers aim to present how poetic tonal prosody developed over time. Such studies include Takaki (1956), Ripley (1980), He (1994), Goh (2004), Yang (2005), etc. Based on the description of “eight defects” in *Bunkyō hifuron* 文鏡秘府論, Takaki (1956) defined some tonal prosodic rules of Recent-style verse, including *pingtou* 平頭, *shangwei* 上尾, *hexi* 鶴膝 and the tonal contrast of the second and fourth syllables, and tried to figure out when those rules were formalized. He calculated the occurrences of those defects in the collections of some representative poets from Eastern Jin dynasty (317-420) and Southern dynasties (420-589)

chronologically, and then compare the rates of those violations. When the rate dropped below a certain percentage, it was concluded that this rule had been established at this time.

The table below shows the occurrences of *hexi* in the collections of the poets from Eastern Jin dynasty and Southern dynasties.

(22) The occurrences of *hexi* in the collections of the poets from Eastern Jin dynasty and Southern dynasties (Takaki 1956: 333)

| Poet | Birth and Death | Number of poems investigated | Number of <i>hexi</i> | Percentage of violation |
|-------------------------------|-----------------|------------------------------|-----------------------|-------------------------|
| Xie Lingyun 謝靈運 | 385-433 | 88 | 62 | 70% |
| Xie Tiao 謝朓 | 464-500 | 134 | 68 | 50% |
| Shen Yue 沈約 | 441-513 | 151 | 33 | 21% |
| Jianwen Emperor of Liang 梁簡文帝 | 503-551 | 251 | 58 | 23% |
| Yu Jianwu 庾肩吾 | ?-550 | 85 | 8 | 9% |
| Yu Xin 庾信 | 513-581 | 249 | 29 | 11% |
| Jiang Zong 江總 | 519-594 | 84 | 8 | 9% |

The percentages of violation significantly decreased chronologically. A similar decrease also can be seen in the violation of other rules. Therefore, Takaki concluded that those rules

were formalized around 550 to 551.

The biggest advantage of quantitative methods is that the dramatic changes in numbers can clearly indicate how a certain rule developed over time, as shown in Takaki's (1956) study. However, in some cases where the numerical differences are very subtle, it is hard to make a clear conclusion by simply comparing those numbers/percentages. Worse still, choosing an inappropriate number/percentage as a benchmark will lead to the opposite conclusion, as demonstrated below.

Du (2012) investigated four pentasyllabic poems of Wei and Jin dynasties (220-420) whose tonal prosody was praised by Shen Yue 沈約 (441-513) in "Xie Lingyun zhuan lun" 謝靈運傳論 (The Biography of Xie Lingyun) of *Song shu* 宋書 (Book of Song)⁶. He suspected that the reason why Shen Yue praised those poems was that the tonal prosody of those poems is close to the Yongming style. Then he calculated the rates of lines in those poems that meet the tonal prosody of the Yongming style and compared the rates with random probability. According to Du's calculation, the rates of the Yongming style lines in those poems were lower or very close to the random probability. Therefore, he concluded that the poets didn't have the consciousness to manipulate the tones when they were creating those poems. The calculation process is shown below.

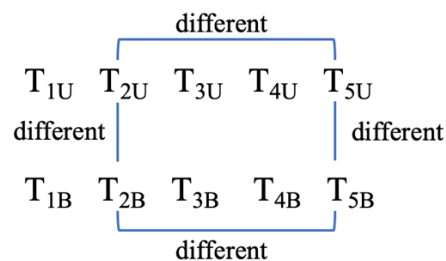
In his study, Du (2012: 20) defined two tonal standards for Yongming style:

⁶ The four poems are Cao Zhi 曹植's "Zeng Ding Yi Wang Can shi" 贈丁儀王粲詩, Wang Can 王粲's "Qiaishi sanshou" 七哀詩三首, Sun Chu 孫楚's "Zhengxi guanshu song yu zhiyanghou zuoshi" 征西官屬送于陟陽候作詩, and Wang Zan 王贊's "Za shi" 雜詩.

- 1) the tones of the second and fifth syllables in a line should be different;
- 2) in a couplet, the tones of the second syllables in both lines should be different, and the tones of the fifth syllables in both lines should be different.

And these two tonal standards can be illustrated as in (23).

(23) Two tonal standards for the Yongming style proposed by Du (2012)



The picture above visually displays the two standards for Yongming style proposed by Du (2012). T_1 to T_5 represent the tones of the five syllables in a pentasyllabic line. The subscript U represents the upper line of a couplet, and the subscript B represents the bottom line of a couplet. T_{1U} represents the tone of the first syllable in the upper line and T_{1B} represents the tone of the first syllable in the bottom line. The first standard requires T_2 and T_5 in each line should be different. On the basis of the first standard, the second standard further requires T_{2U} and T_{2B} should be different, and T_{5U} and T_{5B} should be different. Since Middle Chinese has four different tones, there are $4 \times 4 = 16$ different combinations of T_2 and T_5 , of which $4 \times 3 = 12$ combinations meet the first standard that T_2 and T_5 are different.

Therefore, if we randomly pick five syllables to form a line, the probability that we get a line where T_2 and T_5 are different is 75% (12/16) (Du 2012: 20). If we randomly pick 10 syllables to form a couplet, there are $4 \times 4 \times 4 \times 4 = 256$ different combinations of T_{2U} , T_{5U} , T_{2B} , and T_{5B} , of which $4 \times 3 \times (2 \times 2 + 3) = 84$ combinations meet the second standard. Therefore, the probability is 32.81% (84/256) (Du 2012: 20).

Then Du calculated the rates of the lines in the four poems that meet the two tonal standards for the Yongming style, as shown in (24).

(24) The rates of the lines in the four poems that meet the two standards (adapted from Du 2012: 23)

| Poet | The rate of the lines that meet the first standard | The rate of the lines that meet the second standard |
|-------------|--|---|
| Cao Zhi 曹植 | 72.22% (13/18) | 33.33% (3/9) |
| Wang Can 王粲 | 75% (15/20) | 20% (2/10) |
| Sun Chu 孫楚 | 80% (16/20) | 40% (4/10) |
| Wang Zan 王贊 | 66.67% (8/12) | 33.33% (2/6) |

In Cao Zhi's, Wang Can's, and Wang Zan's poems, the rates of the lines that meet the two standards are lower or very close to the random probabilities; and in Sun Chu's poem, although the rates are higher than the random probabilities, the difference is small.

Therefore, Du concluded that when creating those poems, the poets didn't consciously manipulate the tones to meet a certain standard that was later developed into Yongming style.

However, the main flaw of Du's (2012) research is that he miscalculated the random probabilities. If the syllables with four different tones were evenly distributed in Middle Chinese, the way that he calculated the random probabilities would be correct. But in fact, the syllables with *ping* tone are much more than the syllables with the other three tones in Middle Chinese. Shen (2000) investigated the distribution of 17537 syllables with different initials, rhymes, and tones in the Middle Chinese rhyme book *Guangyun* 廣韻. According to him, 39.82% of the syllables are *ping* tone; 19.18% of them are *shang* tone; 21.78% of them are *qu* tone; and 19.23% of them are *ru* tone (Shen, 2000: 48). Song and Zhang (2015: 44) investigated a large pool of poems written in Six Dynasties (222-589) and found that about 51% of the syllables are *ping* tone; 16% of them are *shang* tone; 17% of them are *qu* tone; and 15% of them are *ru* tone. Since the poetic lexicon is different from the lexicon in rhyme books, I will use the proportions in Song and Zhang's study for the following calculations. The table below shows the 12 combinations of T_2 and T_3 that meet the first standard proposed by Du (2012) and their probabilities.

(25) The 12 combinations of T₂ and T₅ that meet the first standard and their probabilities

| | | | |
|---------------------------------------|------------------------------------|------------------------------------|--------------------------------------|
| <i>ping shang</i> 0.51×0.16 =8.16% | <i>ping qu</i> 0.51×0.17 =8.67% | <i>ping ru</i> 0.51×0.15 =7.65% | <i>shang ping</i> 0.16×0.51=8.16% |
| <i>shang qu</i> 0.16×0.17=2.72% | <i>shang ru</i> 0.16×0.15=2.4% | <i>qu ping</i> 0.17×0.51=8.67% | <i>qu shang</i> 0.17×0.16=2.72% |
| <i>qu ru</i> 0.17×0.15=2.55% | <i>ru ping</i> 0.15×0.51=7.65% | <i>ru shang</i> 0.15×0.16=2.4% | <i>ru qu</i> 0.15×0.17=2.55% |

By adding the probabilities of 12 combinations together, we will get the probability that T₂ and T₅ are different, which is 64.3%. We can follow the same process to calculate the probability that T₁ and T₃ are different or that T₂ and T₄ are different. The result is also 64.3%. That means the probability of getting any two syllables of different tones in a pentasyllabic line is 64.3% if the syllables are randomly arranged. Following the same process, we can get the probability that T_{2U}, T_{5U}, T_{2B}, and T_{5B} are different, which is 23.17%. By comparing 64.3% and 23.17% with the rates in (24), we can find that all the rates are higher than the random probabilities, which goes against Du's (2012) conclusion.

Such type of mistakes, namely, choosing a wrong benchmark to compare numbers, can often be found in the quantitative studies where percentages are used as the evidence to support certain arguments. Another example is from Goh's (2004) dissertation on Wang Rong's 王融 (466-493) tonal patterns. Goh investigated 266 lines of poems written by

Wang Rong and listed the tonal contrasts of any two syllables of a line as shown in (26).

(26) Tonal contrasts of any two syllables within a line (Goh 2004: 101)

| Tonal difference between syllables of a line | Number of lines | % of total lines |
|--|-----------------|------------------|
| 1 and 2 | 154 | 57.9% |
| 1 and 3 | 194 | 72.9% |
| 1 and 4 | 197 | 67.3% |
| 1 and 5 | 180 | 67.7% |
| 2 and 3 | 196 | 73.7% |
| 2 and 4 | 211 | 79.3% |
| 2 and 5 | 232 | 87.2% |
| 3 and 4 | 217 | 81.6% |
| 3 and 5 | 214 | 80.5% |
| 4 and 5 | 176 | 66.2% |

Then she claimed that “each of the ten possible tonal differences appears, in more than half of the tonal lines, which indicates that Wang Rong made regular use of all of them” (Goh 2004: 101). Apparently, Goh chose 50% as the benchmark to compare with the percentages. As stated above, if the tones are randomly arranged, the probability of getting any two syllables of different tones in a pentasyllabic line is 64.3%. In a poet’s collection, if the

percentages of the lines where certain two syllables have different tones are much higher than the random probability, then we can claim that the poet preferred having two syllables with different tones in those positions of a line. As we can see in (26), in some positions, such as 2 and 5, 3 and 4, and 3 and 5, the percentages are much higher than the random probability; in the positions of 1 and 2, the percentage is lower than the random probability; while in some positions, such as 4 and 5, the percentages are very close to the random probability. Here comes another two critical questions regarding how to interpret data:

- 1) To what extent is the percentage of a scheme different from the random probability, and then we can confirm whether or not the poet preferred that pattern when creating poems?
- 2) If the percentage of a pattern is very close or even equal to the random probability, can we conclude that the poet did not use the pattern to create these lines and they are merely the results of random selection?

For example, in (26), the percentage of the tonal contrast in positions 4 and 5 is 66.2%, which is only 1.9% higher than the random probability. Can we conclude that Wang Rong preferred the tonal contrast in positions 4 and 5 based on this subtle difference? If the 1.9% difference is so small that can be ignored, can we conclude that it is the result of a random selection?

Apparently, it is often not sufficient to draw conclusions merely by comparing

percentages, especially when the differences are not huge enough. And even if the percentages are equal to the random probability, we will not assume that the poet randomly selected some words to compose a poem. After all, poetry composition is not a mathematical problem of calculating the probabilities of some controlled factors under an ideal condition. Other than following the tonal prosodic rules of a certain style, many other overt factors, such as rhymes, and recessive factors, such as the linguistic features of the language, will also affect a poet's choice of words. Therefore, to solve the problems mentioned above, we need statistical methods and a more appropriate model to better interpret the data.

Song and Zhang (2015) investigated the tonal prosody of Yongming Style poems. It is the first study that introduced statistical testing into the field of tonal prosody in Chinese poetry and proposed a new comparison model. It is also the first research that tries to calculate the level of strictness of a rule and distinguish rules and tendencies. They proposed the following principles (Song & Zhang 2015:51).

(27) Principles proposed by Song and Zhang to differentiate between rules and tendencies

- a. If a rule exists, then it should be consistently found in all the poems written by a poet, unless there is independent evidence showing that the poet's poems can be divided into different sub-groups that follow different sets of rhythmic rules.
- b. If a rule exists, then it should be consistently applicable to all the lines that meet

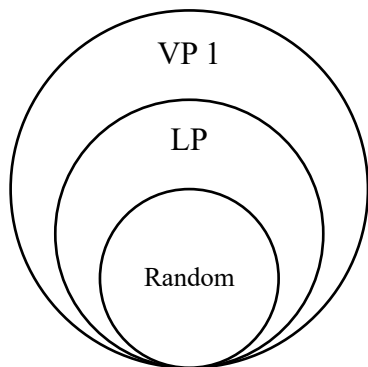
the rule's description in a poem.

c. A rule is different from a tendency in that the former does not tolerate exceptions

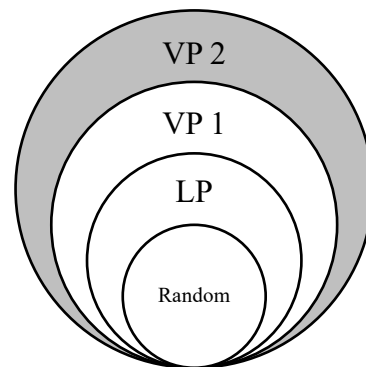
while the latter does.

d. A pattern is composed of one or more rules.

Another improvement of Song and Zhang's study upon the previous quantitative studies is that they propose the following model of factors influencing tonal distribution (Song & Zhang, 2015: 102).



Pre-Yongming tonal distribution



Yongming tonal distribution

In the model above, they “hypothesize that Yongming-era tonal distribution is composed of several factors, including language-conditioned phenomena (LP), verse-specific phenomena that are special to pentasyllabic poems (VP1), and verse-specific phenomena that are specific to Yongming Style (VP2)” (Song & Zhang 2015: 102). The goal of their

study is to identify VP2 and to achieve this goal, they need to compare VP2 with VP1.

By applying chi-square test, binomial test, and Bayesian test, Song and Zhang (2015: 192-193) discover two pair-wise contrast rules in the Yongming tonal prosody on the basis of the poem data obtained from Shen Yue, Wang Rong, and Xie Tiao's pentasyllabic poems. The first rule is that the second and fifth tones of a line must be different if the fifth tone is a *shang*, *qu* or *ru* tone (i.e., Contrast 2-5), and the second rule is that the last tone of each of the two lines in a couplet must be different if the two lines do not rhyme with each other (i.e., Contrast 5-10). It is also found that there is a strong tendency for the second and fourth tones of a line to be different when the fifth tone is a *ping* tone (i.e., Contrast 2-4). They also find six common pattern types, as shown below.

| | | | | |
|-----------|-----------|--------|-----------|--------------------------------|
| Pattern A | X / X - - | mirror | Pattern D | X - X // (excluding / - // /) |
| Pattern B | X X - / - | mirror | Pattern E | X X / - / |
| Pattern C | X - // - | mirror | Pattern F | X / - - / (excluding / - // -) |

Pattern A, B, and C are the common patterns in *ping* rhyming lines (the second line of a couplet), and Pattern D, E, and F are common patterns in *ze* rhyming lines.

1.4 Research Objectives

This dissertation aims to find the tonal rules and the patterns preferred by representative poets in the early Tang dynasty, compare these tonal rules and patterns with

those in the Yongming Style verse, and find out how the tonal prosody was evolved from the Yongming era to the early Tang period.

In order to realize the above goals, the statistical approach is more appropriate, effective, and scientific than the other approaches mentioned above for the following reasons. First, the traditional approach, as presented in Section 1.1 and 1.2, relies on historical documents to build up its theories. However, because of the lack of some essential poetic historical documents, for example, Shen Yue's *Sishengpu* 四聲譜 (*Register of the Four Tones*), and misinterpretations and different interpretations in various documents, historical materials can be misleading. It does not mean that historical documents have no value in tonal prosody studies. They do provide lots of fundamental knowledge about the Recent-style poems. However, as shown in the previous sections, the canonical patterns do not explain the real data very well. Second, the generative approach is used initially to examine poetic metrical patterns of stress languages, such as English. Their theory does not fit Recent-style poems. And it is also inapplicable for revealing the diachronic changes.

Although there are not sufficient historical records of poetics to reveal the rules of Recent-style poems, a large quantity of poems, where the rules are hidden, has been handed down. By using some statistical tests, we can scientifically identify the common patterns in the Recent-style verse and compare these patterns among different historical periods.

Chapter 2. Methodology

2.1 Data Collection

This study examines the pentasyllabic poems of the following poets: Shen Yue 沈約 (441-513), Xie Tiao 謝朓 (464-499), Wang Rong 王融 (467-493), Xue Daoheng 薛道衡 (540-609), Shangguan Yi 上官儀 (608-665), Du Shenyan 杜審言 (c.645-708), Shen Quanqi 沈佺期 (c.656-715) and Song Zhiwen 宋之問 (656-712). It also includes the pentasyllabic Recent-style poems written in the High Tang period in *Tangshi sanbaishou* 唐詩三百首 (Three Hundred Tang poems) (hereafter TSSBS).

(1) Poem collections examined in this study⁷

| Poet/collection | Number of poems | Number of couplets | Number of lines |
|---------------------------|-----------------|--------------------|-----------------|
| Shen Yue ⁸ | 112 | 564 | 1128 |
| Xie Tiao ⁹ | 92 | 715 | 1430 |
| Wang Rong ¹⁰ | 31 | 179 | 358 |
| Xue Daoheng ¹¹ | 16 | 107 | 214 |

⁷ Please see Appendix for the detailed list of poems investigated in this study.

⁸ Data based on Lu Qinli's *Xianqin han wei jin nanbeichao shi* 先秦漢魏晉南北朝詩

⁹ Data based on Lu Qinli's *Xianqin han wei jin nanbeichao shi* 先秦漢魏晉南北朝詩

¹⁰ Data based on Lu Qinli's *Xianqin han wei jin nanbeichao shi* 先秦漢魏晉南北朝詩

¹¹ Data based on <https://sou-yun.cn/PoemIndex.aspx?dynasty=Sui&author=11980>

| | | | |
|----------------------------|-----|------|------|
| Shangguan Yi ¹² | 11 | 49 | 98 |
| Du Shenyang ¹³ | 38 | 212 | 424 |
| Shen Quanqi ¹⁴ | 92 | 597 | 1194 |
| Song Zhiwen ¹⁵ | 128 | 647 | 1294 |
| TSSBS | 85 | 288 | 576 |
| Total | 605 | 3358 | 6716 |

After selecting the poems, the next step is to mark each syllable with the Middle Chinese tone. Available resources that can be used to check the Middle Chinese pronunciations include:

a. reference books

Guangyun 廣韻, Guo Xiliang's *Hanzi guyin shouce* 漢字古音手冊 (1986), Ding Shengshu and Li Rong's *Gujin ziyin duizhao shouce* 古今字音對照手冊 (1981), Bernhard Karlgren's *Grammata Serica Recensa* (1957), *Kangxi Dictionary* 康熙字典 and *Wangli guhanyu Dictionary* 王力古漢語字典 (2000).

b. Websites

www.zdic.net

¹² Data based on *Quan Tangshi* 全唐詩 <https://ctext.org/quantangshi/zhs>

¹³ Data based on *Quan Tangshi* 全唐詩 <https://ctext.org/quantangshi/zhs>

¹⁴ Data based on *Quan Tangshi* 全唐詩 <https://ctext.org/quantangshi/zhs>

¹⁵ Data based on *Quan Tangshi* 全唐詩 <https://ctext.org/quantangshi/zhs>

americanorientalsociety.org/yintong/public

sou-yun.com

xiaoxue.iis.sinica.edu.tw

Thanks to the modern technology, checking the Middle Chinese pronunciation online is much easier and faster¹⁶. After this step, we need to manually adjust the search outcomes because some characters cannot be recognized in the software and some characters have two or more readings. If the character has multiple readings, we need to examine the parts of speech or meanings associated with different readings. For example, 衣 has two Middle Chinese pronunciations, one with *ping* tone and the other with *qu* tone. 衣 with *ping* tone is a noun and means cloth, while with *qu* tone, it is a verb and means to wear. Therefore, for characters with multiple readings, we need to choose the more appropriate one based on the context.

After the above steps are performed, we can get the overall *ping-ze* distributions of all the poems. Take Shen Quanqi's and Song Zhiwen's collections as an example, which are presented in Tables (2) to (5). In the tables, T1 stands for the tone of the first syllable in a couplet; T2 stands for the tone of the second syllable in a couplet; and so on.

¹⁶ Thanks to Professor Hongming Zhang who kindly offered me all the Shen Yue's, Xie Tiao's, Wang Rong's, Shen Quanqi's and Song Zhiwen's poems marked with the Middle Chinese tones.

(2) The numbers of *ping* tone or *ze* tone in each position in a couplet in Shen's collection

| | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <i>ping</i> | 262 | 302 | 488 | 329 | 24 | 488 | 290 | 50 | 308 | 597 |
| <i>ze</i> | 335 | 295 | 109 | 268 | 573 | 109 | 307 | 547 | 289 | 0 |

(3) The percentages of *ping* tone and *ze* tone in each position in a couplet in Shen's collection

| | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|-------------|-------|-------|--------------|-------|--------------|--------------|-------|--------------|-------|------------|
| <i>ping</i> | 43.89 | 50.59 | 81.74 | 55.11 | 4.02 | 81.74 | 48.58 | 8.38 | 51.59 | 100 |
| <i>ze</i> | 56.11 | 49.41 | 18.26 | 44.89 | 95.98 | 18.26 | 51.42 | 91.62 | 48.41 | 0 |

(4) The numbers of *ping* tone or *ze* tone in each position in a couplet in Song's collection

| | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <i>ping</i> | 283 | 328 | 477 | 372 | 34 | 492 | 316 | 83 | 333 | 645 |
| <i>ze</i> | 364 | 319 | 170 | 275 | 613 | 155 | 331 | 564 | 314 | 2 |

(5) The percentages of *ping* tone and *ze* tone in each position in a couplet in Song's collection

| | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|-------------|-------|-------|--------------|-------|--------------|--------------|-------|--------------|-------|--------------|
| <i>ping</i> | 43.74 | 50.70 | 73.72 | 57.50 | 5.26 | 76.04 | 48.84 | 12.83 | 51.47 | 99.69 |
| <i>ze</i> | 56.26 | 49.30 | 26.28 | 42.50 | 94.74 | 23.96 | 51.16 | 87.17 | 48.53 | 0.31 |

From the tables we can see that there are big gaps of the *ping* and *ze* percentages in T3, T5, T6, T8, and T10 positions, as highlighted in Table (3) and Table (5). It is easy to explain the differences in T5 and T10 positions as there is a rule in the Recent-style verse that requires the rhyming syllable which is at the end of a couplet should be *ping* tone. Therefore, in T10 position, almost 100% of the tones are *ping* tone. Another rule of Recent-style, *dui*, requires the tonal pattern of the first line in a couplet should contrast with that of the second line. Therefore, it is also understandable that around 95% of the tones in T5 position is *ze* tone. However, the big gaps of the percentages in T3, T6, and T8 will need further research to explain. Among these three positions, the most important one is probably T3 because the tonal distributions in T6 and T8 are highly related to T3. T8 is the position that is contrast to T3 in a couplet. If most tones in T3 are *ping*, accordingly most tones in T8 will be *ze*. According to *ao-jiu* theory, if the third tone in a line deviates from the canonical pattern, then poets can “save” the pattern by changing the tonal category of the first syllable. Thus, most tones in T6 are *ping*.

(6) The percentages of *ping* tone and *ze* tone in different positions in Wang Rong's poems

| | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <i>ping</i> | 55.31 | 55.87 | 45.25 | 53.63 | 24.58 | 60.34 | 42.46 | 37.99 | 72.07 | 63.69 |
| <i>ze</i> | 44.69 | 44.13 | 54.75 | 46.37 | 75.42 | 39.66 | 57.54 | 62.01 | 27.93 | 36.31 |

Above is the table of the percentages of *ping* tone and *ze* tone in different positions in a couplet in Wang Rong's poems. We can compare the *ping-ze* distribution in a couplet in Wang Rong's poems with that in Shen's and Song's poems, as shown in Table (7).

(7) The comparison of the percentages of *ping-ze* distribution in Wang Rong's poems with that in Shen's and Song's poems

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|--------------------|-------------|-------|-------|--------------|-------|--------------|--------------|-------|--------------|--------------|--------------|
| Shen Quan qi | <i>ping</i> | 43.89 | 50.59 | 81.74 | 55.11 | 4.02 | 81.74 | 48.58 | 8.38 | 51.59 | 100 |
| | <i>ze</i> | 56.11 | 49.41 | 18.26 | 44.89 | 95.98 | 18.26 | 51.42 | 91.62 | 48.41 | 0 |
| Song Zhi wen | <i>ping</i> | 43.74 | 50.70 | 73.72 | 57.50 | 5.26 | 76.04 | 48.84 | 12.83 | 51.47 | 99.69 |
| | <i>ze</i> | 56.26 | 49.30 | 26.28 | 42.50 | 94.74 | 23.96 | 51.16 | 87.17 | 48.53 | 0.31 |
| Wang Rong | <i>ping</i> | 55.31 | 55.87 | 45.25 | 53.63 | 24.58 | 60.34 | 42.46 | 37.99 | 72.07 | 63.69 |
| | <i>ze</i> | 44.69 | 44.13 | 54.75 | 46.37 | 75.42 | 39.66 | 57.54 | 62.01 | 27.93 | 36.31 |

It is obvious that the *ping-ze* distributions in T3, T5, T6, T8, T9 and T10 are very different

between these poets, but in the other positions the percentages are very close. For example, in T2 position, 50.70% of Song Zhiwen's lines are *ping* tone while 49.30% are *ze* tone. In Wang Rong's lines, the percentages are 55.87% and 44.13% respectively. These two sets of numbers are very close, but the question is whether the numbers are similar enough to claim that the *ping-ze* distributions of these two poets' poems are the same.

2.2 Chi-square Test

The Chi-square test is a statistical test which is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories. By applying Chi-square tests, we can scientifically answer the question raised in the end of Section 2.1.

2.2.1 Chi-square Test of Independence

The Chi-square test of independence is used to decide whether there is a significant relationship between two categorical variables. For example, a public opinion poll randomly surveyed 1000 voters. Respondents were classified by gender (male or female) and by voting preference (Republican, Democrat, or Independent). Results are shown in the table below¹⁷.

¹⁷ See <https://stattrek.com/chi-square-test/independence.aspx>

| | Voting Preference | | | Row total |
|--------------|-------------------|----------|-------------|-----------|
| | Republican | Democrat | Independent | |
| Male | 200 | 150 | 50 | 400 |
| Female | 250 | 300 | 50 | 600 |
| Column total | 450 | 450 | 100 | 1000 |

If the investigator wants to know if men's voting preferences differ significantly from the women's preference, the chi-square test of independence can be used in this case.

Similarly, if we want to know whether Song Zhiwen's *ping-ze* distribution in a certain position differs significantly from Wang Rong's, we can use the chi-square test of independence. The following is the calculation process.

(8) The *ping-ze* distributions in T1 position in Wang Rong's and Song Zhiwen's lines

| Poets | Tonal Category in T1 | | Row total |
|--------------|----------------------|-----------|-----------|
| | <i>ping</i> | <i>ze</i> | |
| Wang Rong | 99 | 80 | 179 |
| Song Zhiwen | 283 | 364 | 647 |
| Column Total | 382 | 444 | 826 |

Table (8) shows the *ping-ze* distribution in T1 position in Wang Rong's and Song

Zhiwen's lines. There are in total 179 couplets in Wang Rong's poems, among which 99 syllables in T1 position are *ping* tone and 80 syllables are *ze* tone. Among 647 couplets of Song Zhiwen's poems, 283 syllables are *ping* tone in T1 position, and 364 syllables are *ze* tone. Now we need to find out whether Wang Rong's *ping-ze* distribution in T1 differs from Song Zhiwen's.

First, we need to define null hypothesis (H_0) and alternative hypothesis (H_1). The null hypothesis is what is assumed to be true until there is evidence to go against it.

H_0 : There is no significant difference between these two poets in the *ping-ze* distribution in T1 position.

H_1 : There is a significant difference between these two poets in the *ping-ze* distribution in T1 position.

The formula of the chi-square test is given as follows:

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e}$$

f_o stands for the frequency of the observed value and f_e stands for the frequency of the expected value. In Table (2.1.1-1) we have gotten the observed frequency, now we need to calculate the expected frequency from the observed frequency, as shown in Table (2.1.1-2)

(9): Calculating the expected frequency in T1 position

| | Tonal Category in T1 | | |
|--------------|--|--|-----------|
| Poets | <i>Ping</i> | <i>Ze</i> | Row total |
| Wang Rong | $\frac{382}{826} \times 179 \approx 83$ | $\frac{444}{826} \times 179 \approx 96$ | 179 |
| Song Zhiwen | $\frac{382}{826} \times 647 \approx 299$ | $\frac{444}{826} \times 647 \approx 348$ | 647 |
| Column Total | 382 | 444 | 826 |

These two poets in total have 826 couplets, among which 382 syllables are *ping* tone in T1 position and 444 syllables are *ze* tone. Therefore, the expected probability of having a *ping* tone in T1 is $\frac{382}{826}$ and the expected probability of having a *ze* tone is $\frac{444}{826}$. Wang Rong has 179 couplets and Song Zhiwen has 647 couplets. Thus, if they have the same preference in the *ping-ze* distribution in T1, then the expected frequency should be as shown in Table (9).

Then, after getting the expected frequency, we can calculate the chi-square value χ^2 .

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = \frac{(99-83)^2}{83} + \frac{(80-96)^2}{96} + \frac{(283-299)^2}{299} + \frac{(364-348)^2}{348} = 7.343$$

(10) The probability ranges for chi-square values¹⁸

| | | | | | | |
|----|----------|-------|-------|--------------|-------|-------|
| DF | 0.975 | 0.20 | 0.10 | 0.05 | 0.025 | 0.02 |
| 1 | 0.000982 | 1.642 | 2.706 | 3.841 | 5.024 | 5.412 |

¹⁸ See <https://www.medcalc.org/manual/chi-square-table.php>

| | | | | | | |
|---|--------|-------|-------|-------|-------|-------|
| 2 | 0.0506 | 3.219 | 4.605 | 5.991 | 7.378 | 7.824 |
| 3 | 0.216 | 4.642 | 6.251 | 7.815 | 9.348 | 9.837 |

DF stands for degrees of freedom, which are calculated using the following formula: $df = (r-1)(c-1)$ where r is the number of rows and c is the number of columns. Therefore, in this study, $df=1$. If we choose the probability value $p=0.05$, $df=1$, then based on Table (10) we can find the critical value of $\chi^2_{0.05}(1) = 3.841$, which will be used as the threshold in this study. Because the observed test statistic $\chi^2 = 7.343$, larger than 3.84, we can conclude that the probability of “wrongly rejecting H_0 ” is smaller than 5%. Therefore, we reject H_0 and accept H_1 that there is a significant difference between these two poets in the *ping-ze* distribution in T1 position.

2.2.2 Chi-square Goodness of Fit Test

Another use of the chi-square test is to analyze whether the observed frequencies fit the expected model. For example:

The natural birth ratio of males and females in a region is 103 boys for every 100 girls. In a hospital in one year, among 255 births, 140 are boys and 115 are girls.

Can we conclude that the male to female birth ratio in this hospital is natural (expected) or not? (Song & Zhang, 2015: 60)

The chi-square goodness of fit test can be used to answer the above question. In this study, the chi-square goodness of fit test is used to test whether the tonal distributions of Song Zhiwen's regulated poems fits a certain tonal pattern of Yongming poems. The following is an example.

(11) The frequencies of the second lines of *ping* rhyme couplets falling into Pattern A, B, and C in the Yongming collections (revised from Song & Zhang, 2015: 147)

| | Pattern A X / X - - | Pattern B X X - / - | Pattern C X - // - | Others | Row total |
|--------------|------------------------|------------------------|-----------------------|--------|-----------|
| Shen Yue | 228 | 67 | 42 | 17 | 354 |
| Wang Rong | 70 | 26 | 6 | 12 | 114 |
| Xie Tiao | 188 | 67 | 51 | 23 | 329 |
| Column total | 486 | 160 | 99 | 52 | 797 |

(12) The frequencies of the second lines of *ping* rhyme couplets falling into Pattern A, B, and C in Song Zhiwen's regulated poems

| | Pattern A X / X - - | Pattern B X X - / - | Pattern C X - // - | Others | Row total |
|-------------|------------------------|------------------------|-----------------------|--------|-----------|
| Song Zhiwen | 322 | 63 | 239 | 21 | 645 |

Tables (11) and (12) list the frequencies of the second lines of *ping* rhyme couplets falling into Pattern A, B, and C in the Yongming collections and Song Zhiwen's regulated poems respectively. As mentioned in the end of Section 1.4, these three patterns are the common patterns in the Yongming collections. Now the question is whether Song Zhiwen also shows the preference of these three patterns in his poetic composition. The calculation process is similar to the chi-square test of independence.

First, we need to define H_0 and H_1 .

H_0 : There is no significant difference between the Yongming collections and Song Zhiwen's poems in the preference of using Pattern A, B, and C.

H_1 : There is a significant difference between the Yongming collections and Song Zhiwen's poems in the preference of using Pattern A, B, and C.

(13) The expected frequencies of the second lines of *ping* rhyme couplets falling into Pattern A, B, and C in Song Zhiwen's regulated poems

| | Pattern A X / X - - | Pattern B X X - / - | Pattern C X - / / - | Others | Row total |
|--------------------|---|---|---|---|-----------|
| Expected frequency | $\frac{486}{797} \times 645$ ≈ 393 | $\frac{160}{797} \times 645$ ≈ 130 | $\frac{99}{797} \times 645$ ≈ 80 | $\frac{52}{797} \times 645$ ≈ 42 | 645 |

In this test, we will use the total frequencies in Table (11), the numbers in column total and

row total, as the expected value. Then we can get the expected frequencies of Song Zhiwen's poems as shown in Table (13).

Then, we can use the same formula to calculate the chi-square value as shown below:

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = \frac{(322-393)^2}{393} + \frac{(63-130)^2}{130} + \frac{(239-80)^2}{80} + \frac{(21-42)^2}{42} = 373.871$$

Because 373.871 is larger than the critical value $\chi^2_{0.05}(3) = 7.815$, therefore we reject H_0 , and there is a significant difference between the Yongming collections and Song Zhiwen's poems in the preference of using Pattern A, B, and C.

2.3 Pearson Correlation Coefficient

Another statistical test used in this study is Pearson Correlation Coefficient, also known as Pearson product-moment correlation. It is a measure of a linear correlation between two sets of variables. It attempts to find a line of best fit through the two sets of data and the Pearson product-moment correlation, which is denoted as r , indicates how far away all the data to the line of best fit. The procedures of applying Pearson correlation coefficient to verify whether there is a correlation between two sets of variables, X and Y, are as following.

First, we need to define null hypothesis (H_0) and alternative hypothesis (H_1). The null hypothesis is what is assumed to be true until there is evidence to go against it.

H_0 : There is no correlation between X and Y.

H_1 : There is a correlation between X and Y.

Then, we can use the following the formula to calculate the value of r :

$$r_{xy} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^n (y_i - \bar{y})^2}}$$

In this formular, n is sample size; x_i and y_i are the individual sample point labeled with i ; \bar{x} and \bar{y} are the mean value in the sets of X and Y.

Then, we can consult the table for the critical values for the Pearson correlation coefficient of $(n-2)$ degrees of freedom and $\alpha=0.05$ significant level. If r is larger than the critical value, then we will decline H_0 ; if r is smaller than the critical value, then we will accept H_0 .

Chapter 3. The Tonal Distributions

3.1 Introduction

This chapter investigates the tonal distributions within a couplet. By applying chi-square tests, I will examine whether any difference in the tonal distribution can be found among the Yongming poets (Section 3.2 and Section 3.3) and among the early Tang poets (Section 4.4) respectively. The test results will help us to answer the following questions:

- (a) Did the Yongming poets begin to have the awareness to create the binary tonal contrast?
- (b) What is the difference between the Yongming poets and the early Tang poets with respect to the distribution of tones within a couplet?

3.2 The Percentages of the *Ping-ze* Distribution within a Couplet

(1)

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|----------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Shen Yue | <i>ping</i> | 53.19 | 59.22 | 45.92 | 52.66 | 24.29 | 58.51 | 42.20 | 34.04 | 68.62 | 62.41 |
| | <i>ze</i> | 46.81 | 40.78 | 54.08 | 47.34 | 75.71 | 41.49 | 57.80 | 65.96 | 31.38 | 37.59 |
| Xie Tiao | <i>ping</i> | 56.64 | 51.19 | 45.17 | 55.24 | 34.97 | 66.71 | 48.39 | 41.96 | 64.90 | 46.99 |
| | <i>ze</i> | 43.36 | 48.81 | 54.83 | 44.76 | 65.03 | 33.29 | 51.61 | 58.04 | 35.10 | 53.01 |

| | | | | | | | | | | | |
|-----------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Wang | <i>ping</i> | 54.75 | 55.87 | 45.25 | 53.07 | 24.58 | 60.34 | 42.46 | 37.99 | 72.07 | 63.69 |
| Rong | <i>ze</i> | 45.25 | 44.13 | 54.75 | 46.93 | 75.42 | 39.66 | 57.54 | 62.01 | 27.93 | 36.31 |
| Xue | <i>ping</i> | 59.81 | 67.29 | 63.55 | 42.99 | 12.15 | 52.34 | 31.78 | 25.23 | 71.96 | 85.05 |
| Daoheng | <i>ze</i> | 40.19 | 32.71 | 36.45 | 57.01 | 87.85 | 47.66 | 68.22 | 74.77 | 28.04 | 14.95 |
| Shangguan | <i>ping</i> | 36.73 | 46.94 | 81.63 | 65.31 | 4.08 | 73.47 | 48.98 | 22.45 | 51.02 | 97.96 |
| Yi | <i>ze</i> | 63.27 | 53.06 | 18.37 | 34.69 | 95.92 | 26.53 | 51.02 | 77.55 | 48.98 | 2.04 |
| Du | <i>ping</i> | 35.38 | 50.94 | 84.91 | 52.83 | 1.89 | 73.58 | 48.58 | 3.30 | 51.42 | 100.0 |
| Shenyan | <i>ze</i> | 64.62 | 49.06 | 15.09 | 47.17 | 98.11 | 26.42 | 51.42 | 96.70 | 48.58 | 0.0 |
| Shen | <i>ping</i> | 43.89 | 50.59 | 81.91 | 55.11 | 4.02 | 81.74 | 48.58 | 8.38 | 51.59 | 100.0 |
| Quanqi | <i>ze</i> | 56.11 | 49.41 | 18.09 | 44.89 | 95.98 | 18.26 | 51.42 | 91.62 | 48.41 | 0.0 |
| Song | <i>ping</i> | 43.74 | 50.70 | 73.73 | 57.50 | 5.41 | 76.04 | 48.84 | 12.83 | 51.47 | 99.69 |
| Zhiwen | <i>ze</i> | 56.26 | 49.30 | 26.28 | 42.50 | 94.59 | 23.96 | 51.16 | 87.17 | 48.53 | 0.31 |

The table above summarizes the percentages of the *ping-ze* distribution within a couplet from Shen Yue to Song Zhiwen. One obvious tendency is that the proportion of *ping* syllables in T10 significantly increases from the Yongming Era to the early Tang. Accordingly, the proportion of *ping* syllables in T5 decreases over time. The reasons that triggered the tendencies are clear: 1) the majority of the rhyming syllables in the Recent-style verse are *ping* tone and the rhyming syllables in *ze* tone are rare (Wang, 1958: 52); and 2) the tonal categories in T5 and T10 should be different.

Besides indicating the changes over time, this table also presents some similarities within a certain period. In the three Yongming poets' collections (Shen Yue, Xie Tiao, and Wang Rong), the percentages of the *ping-ze* distributions in T3 are almost the same, which are around 45% versus 54%. Shen Yue's and Wang Rong's collections share more similarities in T5 and T7 in terms of the *ping-ze* distribution. In the early Tang collections, the percentages of the *ping-ze* distribution in T2 are almost identical in Du Shenyang's, Shen Quanqi's, and Song Zhiwen's poems. The rules are more apparent in the second line. The percentages of the *ping-ze* distributions are almost identical in T7, which are around 49% versus 51%, in Shangguan Yi's, Du Shenyang's, Shen Quanqi's, and Song Zhiwen's collections. On the contrary, the percentages of the *ping-ze* distribution in T9 are 51% versus 49%, which is exactly opposite to that in T7. This indicates another rule of the Recent-style verse that the second and the fourth syllables in a line should have different tonal categories.

Generally speaking, based on the data shown above, the early Tang collections present more similarities and clearer tendencies than the Yongming collections in terms of the overall *ping-ze* distribution within a couplet.

In addition to the figures mentioned in the previous paragraphs with a difference of less than 1%, many other figures are also very close to each other, but the differences are larger than 1%. In the following sections, I will analyze whether poets present the same tonal distribution in a certain position by applying the chi-square test.

3.3 The Tonal Distribution in the Yongming Collections

3.3.1 The *ping-ze* distribution

The following tables respectively present the frequencies and the percentages of the *ping-ze* distribution in the collections of Shen Yue, Xie Tiao, and Wang Rong.

(2) The frequencies of the *ping-ze* distribution in the Yongming collections

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Shen | <i>ping</i> | 300 | 334 | 259 | 297 | 137 | 330 | 238 | 192 | 387 | 352 |
| Yue | <i>ze</i> | 264 | 230 | 305 | 267 | 427 | 234 | 326 | 372 | 177 | 212 |
| Xie | <i>ping</i> | 405 | 366 | 323 | 395 | 250 | 477 | 346 | 300 | 464 | 336 |
| Tiao | <i>ze</i> | 310 | 349 | 392 | 320 | 465 | 238 | 369 | 415 | 251 | 379 |
| Wang | <i>ping</i> | 98 | 100 | 81 | 95 | 44 | 108 | 76 | 68 | 129 | 114 |
| Rong | <i>ze</i> | 81 | 79 | 98 | 84 | 135 | 71 | 103 | 111 | 50 | 65 |

(3) The percentages of the *ping-ze* distribution in the Yongming collections

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Shen | <i>ping</i> | 53.19 | 59.22 | 45.92 | 52.66 | 24.29 | 58.51 | 42.20 | 34.04 | 68.62 | 62.41 |
| Yue | <i>ze</i> | 46.81 | 40.78 | 54.08 | 47.34 | 75.71 | 41.49 | 57.80 | 65.96 | 31.38 | 37.59 |
| Xie | <i>ping</i> | 56.64 | 51.19 | 45.17 | 55.24 | 34.97 | 66.71 | 48.39 | 41.96 | 64.90 | 46.99 |

| | | | | | | | | | | | |
|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Tiao | <i>ze</i> | 43.36 | 48.81 | 54.83 | 44.76 | 65.03 | 33.29 | 51.61 | 58.04 | 35.10 | 53.01 |
| Wang | <i>ping</i> | 54.75 | 55.87 | 45.25 | 53.07 | 24.58 | 60.34 | 42.46 | 37.99 | 72.07 | 63.69 |
| Rong | <i>ze</i> | 45.25 | 44.13 | 54.75 | 46.93 | 75.42 | 39.66 | 57.54 | 62.01 | 27.93 | 36.31 |

From these tables, we can see that in some positions, the percentages of the *ping-ze* distributions in the three poets' collections are very close. For example, there are about 45% of the syllables at T3 are *ping* tone. The biggest disparity is only 0.75% (between Shen Yue and Xie Tiao). However, the disparity expands to 8.2% at T6. The question is whether we can conclude that the *ping-ze* distributions at T3 in the three poets' collections are the same and the *ping-ze* distributions at the T6 position are different. In this section, we will figure out whether there are any differences in the *ping-ze* distribution at each position in a couplet in Yongming collections by applying the chi-square test.

(4) The *ping-ze* distributions at T1

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|----------|----------|-----------|-----------|
| <i>ping</i> | 300 | 405 | 98 | 803 |
| <i>ze</i> | 264 | 310 | 81 | 655 |
| Column total | 564 | 715 | 179 | 1458 |

The table above shows the *ping-ze* distribution at T1 position in the three Yongming

poets' collections. There are in total 564 couplets in Shen Yue's collection, among which 300 syllables at T1 are *ping* tone and 264 syllables are *ze* tone. Among 715 couplets in Xie Tiao's collection, 405 syllables are *ping* tone at T1, and 310 syllables are *ze* tone. In Wang Rong's collection, there are 98 syllables with *ping* tone and 81 syllables with *ze* tone at T1. Then, we need to define the null hypothesis (H0) and the alternative hypothesis (H1), as presented in (5). The null hypothesis is what is assumed to be true until there is evidence to go against it.

(5) H0: There is no significant difference among these three poets in the *ping-ze* distribution at T1.

H1: There is a significant difference among these three poets in the *ping-ze* distribution at T1.

(6) Calculating the expected frequencies at T1

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|-------------|---|---|--|-----------|
| <i>ping</i> | $\frac{803}{1458} \times 564$ = 310.63 | $\frac{803}{1458} \times 715$ = 393.79 | $\frac{803}{1458} \times 179$ = 98.59 | 803 |
| <i>ze</i> | $\frac{655}{1458} \times 564$ = 253.37 | $\frac{655}{1458} \times 715$ = 321.21 | $\frac{655}{1458} \times 179$ = 80.41 | 655 |

| | | | | |
|--------------|-----|-----|-----|------|
| Column total | 564 | 715 | 179 | 1458 |
|--------------|-----|-----|-----|------|

These three poets in total have 1458 syllables at T1, of which 803 are *ping* tone and 655 are *ze* tone. Therefore, the expected probability of having a *ping* tone at T1 is $\frac{803}{1458}$ and the expected probability of having a *ze* tone is $\frac{655}{1458}$. Shen Yue has 564 couplets, Xie Tiao has 715 couplets, and Wang Rong has 179 couplets. Thus, if they have the same preference in the *ping-ze* distribution at T1, then the expected frequencies should be the same as those shown in (6).

Then, after getting the expected frequencies, we can calculate the chi-square value χ^2 .

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = \frac{(300-310.63)^2}{310.63} + \frac{(264-253.37)^2}{253.37} + \frac{(405-393.79)^2}{393.79} + \frac{(310-321.21)^2}{321.21} + \frac{(98-98.59)^2}{98.59} + \frac{(81-80.41)^2}{80.41} = 1.527$$

In this test, $df = (\text{row category number} - 1) \times (\text{column category number} - 1) = 2 \times 1 = 2$. If we choose the probability value $p=0.05$, $df=2$, the critical value of $\chi^2_{0.05}(2)$ is 5.991. Because $1.527 < 5.991$, we reject H_1 and accept H_0 that there is no significant difference among these poets in the *ping-ze* distribution at T1.

In the following, I will briefly present the data and the chi-square values from T2 to T10 positions.

(7) The *ping-ze* distributions at T2¹⁹

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|-------------|-----------|
| <i>ping</i> | 334 (309.47) | 366 (392.32) | 100 (98.22) | 800 |
| <i>ze</i> | 230 (254.53) | 349 (322.68) | 79 (80.78) | 658 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 8.293 > 5.991$$

There is a significant difference among these three poets in the *ping-ze* distribution at T2.

(8) The *ping-ze* distributions at T3

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 259 (256.47) | 323 (325.13) | 81 (81.40) | 663 |
| <i>ze</i> | 305 (307.53) | 392 (389.87) | 98 (97.60) | 795 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 0.075 < 5.991$$

There is no significant difference among these three poets in the *ping-ze* distribution at T3.

(9) The *ping-ze* distributions at T4

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|-------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 297 (304.44) | 395 (385.94) | 95 (96.62) | 787 |

¹⁹ The numbers in parentheses are the expected frequencies.

| | | | | |
|--------------|--------------|--------------|------------|------|
| <i>ze</i> | 267 (259.56) | 320 (329.06) | 84 (82.38) | 671 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 0.916 < 5.991$$

There is no significant difference among these three poets in the *ping-ze* distribution at T4.

(10) The *ping-ze* distributions at T5

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 137 (166.72) | 250 (211.36) | 44 (52.91) | 431 |
| <i>ze</i> | 427 (397.28) | 465 (503.64) | 135 (126.09) | 1027 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 19.683 > 5.991$$

There is a significant difference among these three poets in the *ping-ze* distribution at T5.

(11) The *ping-ze* distributions at T6

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 330 (353.95) | 477 (448.71) | 108 (112.34) | 915 |
| <i>ze</i> | 234 (210.05) | 238 (266.29) | 71 (66.67) | 543 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 9.589 > 5.991$$

There is a significant difference among these three poets in the *ping-ze* distribution at T6.

(12) The *ping-ze* distributions at T7

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|-------------|-----------|
| <i>ping</i> | 238 (255.31) | 346 (323.66) | 76 (81.03) | 660 |
| <i>ze</i> | 326 (308.69) | 369 (391.34) | 103 (97.97) | 798 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 5.531 < 5.991$$

There is no significant difference among these three poets in the *ping-ze* distribution at T7.

(13) The *ping-ze* distributions at T8

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 192 (216.63) | 300 (274.62) | 68 (68.75) | 560 |
| <i>ze</i> | 372 (347.37) | 415 (440.38) | 111 (110.25) | 898 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 8.366 > 5.991$$

There is a significant difference among these three poets in the *ping-ze* distribution at T8.

(14) The *ping-ze* distributions at T9

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|-------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 387 (379.09) | 464 (480.59) | 129 (120.32) | 980 |

| | | | | |
|--------------|--------------|--------------|------------|------|
| <i>ze</i> | 177 (184.91) | 251 (234.41) | 50 (58.68) | 478 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 4.162 < 5.991$$

There is no significant difference among these three poets in the *ping-ze* distribution at T9.

(15) The *ping-ze* distributions at T10

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|-------------|-----------|
| <i>ping</i> | 352 (310.24) | 336 (393.30) | 114 (98.46) | 802 |
| <i>ze</i> | 212 (253.76) | 379 (321.70) | 65 (80.54) | 656 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 36.497 > 5.991$$

There is a significant difference among these three poets in the *ping-ze* distribution at T10.

In summary, the *ping-ze* distribution is identical in T1, T3, T4, T7, and T9 among the Yongming collections, while significant differences can be found among the three poets at T2, T5, T6, T8, and T10.

3.3.2 The distributions of the four tones

The following tables respectively present the frequencies and the percentages of the

distributions of the four tones in the collections of Shen Yue, Xie Tiao, and Wang Rong.

(16) The frequencies of the distributions of the four tones in the Yongming collections

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Shen | <i>ping</i> | 300 | 334 | 259 | 297 | 137 | 330 | 238 | 192 | 387 | 352 |
| | <i>shang</i> | 85 | 79 | 109 | 112 | 160 | 66 | 135 | 135 | 70 | 33 |
| Yue | <i>qu</i> | 84 | 77 | 126 | 85 | 148 | 76 | 126 | 133 | 69 | 77 |
| | <i>ru</i> | 95 | 74 | 70 | 70 | 119 | 92 | 65 | 104 | 38 | 102 |
| Xie | <i>ping</i> | 405 | 366 | 323 | 395 | 250 | 477 | 346 | 300 | 464 | 336 |
| Tiao | <i>shang</i> | 87 | 124 | 127 | 131 | 170 | 50 | 163 | 143 | 111 | 101 |
| | <i>qu</i> | 116 | 115 | 166 | 114 | 157 | 84 | 129 | 180 | 93 | 125 |
| | <i>ru</i> | 107 | 110 | 99 | 75 | 138 | 104 | 77 | 92 | 47 | 153 |
| Wang | <i>ping</i> | 98 | 100 | 81 | 95 | 44 | 108 | 76 | 68 | 129 | 114 |
| Rong | <i>shang</i> | 30 | 22 | 28 | 39 | 63 | 18 | 36 | 42 | 20 | 19 |
| | <i>qu</i> | 28 | 29 | 34 | 32 | 41 | 22 | 39 | 44 | 22 | 14 |
| | <i>ru</i> | 23 | 28 | 36 | 13 | 31 | 31 | 28 | 25 | 8 | 32 |

(17) The percentages of the distributions of the four tones in the Yongming collections

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Shen | <i>ping</i> | 53.19 | 59.22 | 45.92 | 52.66 | 24.29 | 58.51 | 42.20 | 34.04 | 68.62 | 62.41 |
| | <i>shang</i> | 15.07 | 14.01 | 19.33 | 19.86 | 28.37 | 11.70 | 23.94 | 23.94 | 12.41 | 5.85 |
| Yue | <i>qu</i> | 14.89 | 13.65 | 22.34 | 15.07 | 26.24 | 13.48 | 22.34 | 23.58 | 12.23 | 13.65 |
| | <i>ru</i> | 16.84 | 13.12 | 12.41 | 12.41 | 21.10 | 16.31 | 11.52 | 18.44 | 6.74 | 18.09 |
| Xie | <i>ping</i> | 56.64 | 51.19 | 45.17 | 55.24 | 34.97 | 66.71 | 48.39 | 41.96 | 64.90 | 46.99 |
| Tiao | <i>shang</i> | 12.17 | 17.34 | 17.76 | 18.32 | 23.78 | 6.99 | 22.80 | 20.00 | 15.52 | 14.13 |
| | <i>qu</i> | 16.22 | 16.08 | 23.22 | 15.94 | 21.96 | 11.75 | 18.04 | 25.17 | 13.01 | 17.48 |
| | <i>ru</i> | 14.97 | 15.38 | 13.85 | 10.49 | 19.30 | 14.55 | 10.77 | 12.87 | 6.57 | 21.40 |
| Wang | <i>ping</i> | 54.75 | 55.87 | 45.25 | 53.07 | 24.58 | 60.34 | 42.46 | 37.99 | 72.07 | 63.69 |
| Rong | <i>shang</i> | 16.76 | 12.29 | 15.64 | 21.79 | 35.20 | 10.06 | 20.11 | 23.46 | 11.17 | 10.61 |
| | <i>qu</i> | 15.64 | 16.20 | 18.99 | 17.88 | 22.91 | 12.29 | 21.79 | 24.58 | 12.29 | 7.82 |
| | <i>ru</i> | 12.85 | 15.64 | 20.11 | 7.26 | 17.32 | 17.32 | 15.64 | 13.97 | 4.47 | 17.88 |

Then we will follow the similar procedures as in the last section to test whether the distributions of the four tones at a certain position are the same among the Yongming collections. The only difference is that in this study, $df = (\text{row category number} - 1) \times (\text{column category number} - 1) = 2 \times 3 = 6$, and thus the critical value $\chi^2_{0.05}(6) = 12.592$. In the following, I will briefly present the data and the chi-square values from T1 to T10

positions.

(18) The distributions of the four tones at T1

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 300 (310.62) | 405 (393.79) | 98 (98.59) | 803 |
| <i>shang</i> | 85 (78.14) | 87 (99.06) | 30 (24.80) | 202 |
| <i>qu</i> | 84 (88.20) | 116 (111.81) | 28 (27.99) | 228 |
| <i>ru</i> | 95 (87.04) | 107 (110.34) | 23 (27.62) | 225 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 5.807 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T1.

(19) The distributions of the four tones at T2

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|-------------|-----------|
| <i>ping</i> | 334 (309.47) | 366 (392.32) | 100 (98.22) | 800 |
| <i>shang</i> | 79 (87.04) | 124 (110.34) | 22 (27.62) | 225 |
| <i>qu</i> | 77 (85.49) | 115 (108.38) | 29 (27.13) | 221 |
| <i>ru</i> | 74 (82.00) | 110 (103.96) | 28 (26.03) | 212 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 9.979 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T2.

(20) The distributions of the four tones at T3

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 259 (256.47) | 323 (325.13) | 81 (81.40) | 663 |
| <i>shang</i> | 109 (102.12) | 127 (129.47) | 28 (32.41) | 264 |
| <i>qu</i> | 126 (126.11) | 166 (159.87) | 34 (40.02) | 326 |
| <i>ru</i> | 70 (79.30) | 99 (100.53) | 36 (25.17) | 205 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 8.069 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T3.

(21) The distributions of the four tones at T4

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 297 (304.44) | 395 (385.95) | 95 (96.62) | 787 |
| <i>shang</i> | 112 (109.09) | 131 (138.29) | 39 (34.62) | 282 |
| <i>qu</i> | 85 (89.36) | 114 (113.28) | 32 (28.36) | 231 |
| <i>ru</i> | 70 (61.11) | 75 (77.48) | 13 (19.40) | 158 |

| | | | | |
|--------------|-----|-----|-----|------|
| Column total | 564 | 715 | 179 | 1458 |
|--------------|-----|-----|-----|------|

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 5.602 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T4.

(22) The distributions of the four tones at T5

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 137 (166.72) | 250 (211.36) | 44 (52.91) | 431 |
| <i>shang</i> | 160 (152.03) | 170 (192.73) | 63 (48.25) | 393 |
| <i>qu</i> | 148 (133.84) | 157 (169.68) | 41 (42.48) | 346 |
| <i>ru</i> | 119 (111.41) | 138 (141.23) | 31 (35.36) | 288 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 25.097 > 12.592$$

There is a significant difference among these three poets in the tonal distribution at T5.

(23) The distributions of the four tones at T6

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 330 (353.95) | 477 (448.72) | 108 (112.34) | 915 |
| <i>shang</i> | 66 (51.84) | 50 (65.71) | 18 (16.45) | 134 |
| <i>qu</i> | 76 (70.40) | 84 (89.25) | 22 (22.34) | 182 |

| | | | | |
|--------------|------------|--------------|------------|------|
| <i>ru</i> | 92 (87.81) | 104 (111.32) | 31 (27.87) | 227 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 13.137 > 12.592$$

There is a significant difference among these three poets in the tonal distribution at T6.

(24) The distributions of the four tones at T7

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 238 (255.31) | 346 (323.66) | 76 (81.03) | 660 |
| <i>shang</i> | 135 (129.20) | 163 (163.79) | 36 (41.01) | 334 |
| <i>qu</i> | 126 (113.73) | 129 (144.18) | 39 (36.09) | 294 |
| <i>ru</i> | 65 (65.76) | 77 (83.37) | 28 (20.87) | 170 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 9.988 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T7.

(25) The distributions of the four tones at T8

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 192 (216.62) | 300 (274.62) | 68 (68.75) | 560 |
| <i>shang</i> | 135 (123.79) | 143 (156.93) | 42 (39.29) | 320 |

| | | | | |
|--------------|--------------|--------------|------------|------|
| <i>qu</i> | 133 (138.10) | 180 (175.07) | 44 (43.83) | 357 |
| <i>ru</i> | 104 (85.49) | 92 (108.38) | 25 (27.13) | 221 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 14.570 > 12.592$$

There is a significant difference among these three poets in the tonal distribution at T8.

(26) The distributions of the four tones at T9

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 387 (379.09) | 464 (480.59) | 129 (120.31) | 980 |
| <i>shang</i> | 70 (77.75) | 111 (98.57) | 20 (24.68) | 201 |
| <i>qu</i> | 69 (71.18) | 93 (90.23) | 22 (22.59) | 184 |
| <i>ru</i> | 38 (35.98) | 47 (45.61) | 8 (11.42) | 93 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 5.938 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T9.

(27) The distributions of the four tones at T10

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|-------------|--------------|--------------|-------------|-----------|
| <i>ping</i> | 352 (310.24) | 336 (393.30) | 114 (98.46) | 802 |

| | | | | |
|--------------|--------------|--------------|------------|------|
| <i>shang</i> | 33 (59.19) | 101 (75.03) | 19 (18.78) | 153 |
| <i>qu</i> | 77 (83.55) | 125 (105.93) | 14 (26.52) | 216 |
| <i>ru</i> | 102 (111.02) | 153 (140.74) | 32 (35.24) | 287 |
| Column total | 564 | 715 | 179 | 1458 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 48.953 > 12.592$$

There is a significant difference among these three poets in the tonal distribution at T10.

In summary, the distributions of the four tones are identical at T1, T2, T3, T4, T7, and T9 among the Yongming collections, while significant differences can be found at T5, T6, T8, and T10. In the previous section, we tested whether the Yongming poets have the same *ping-ze* distributions within a couplet and found that the *ping-ze* distributions are identical at 5 positions. In this section, we found that the poets shared the same distributions of the four tones at 6 positions, which is more than the positions where they shared the same *ping-ze* distributions. This may indicate that the tonal prosodic rules of the Yongming style verse were based on the four tones instead of the two tonal categories, *ping* and *ze*. However, at this point, we have to admit that the conclusion drawn from the above observations is not well-grounded because the difference is subtle. Another observation is that the difference of the tonal distributions among the three poets at T10, the rhyming position, is the largest. As shown in (17), the percentage of the rhyming syllables with *ping* tone in Xie Tiao's collection is much lower than that in Shen Yue's and Wang Rong's collections. Obviously,

the poets have very different preferences on the tonal selection at the rhyming positions and thus, the chi-square value at T10 is the largest. But whether the different tonal preferences at rhyming positions only affect the data at T10? In other words, whether the tonal prosodic rules of a couplet vary with the rhyming syllables? In the next sections, I will divide the data into two groups according to the tonal categories of T10 (namely, according to whether it is *ping* tone or *ze* tone). Then I will test whether the tonal distributions are the same in these two groups.

3.3.3 The distributions of the four tones in the *ping* rhyming couplets

The following tables respectively present the frequencies and the percentages of the distributions of the four tones in the *ping* rhyming couplets of the Yongming collections.

(28) The frequencies of the distributions of the four tones in the *ping* rhyming couplets of the Yongming collections

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|------|--------------|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|
| Shen | <i>ping</i> | 200 | 235 | 171 | 180 | 18 | 179 | 93 | 88 | 234 | 352 |
| Yue | <i>shang</i> | 48 | 40 | 67 | 74 | 115 | 49 | 106 | 80 | 36 | 0 |
| | <i>qu</i> | 49 | 39 | 75 | 54 | 127 | 58 | 97 | 96 | 49 | 0 |
| | <i>ru</i> | 55 | 38 | 39 | 44 | 92 | 66 | 56 | 88 | 33 | 0 |

| | | | | | | | | | | | |
|------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Xie | <i>ping</i> | 204 | 210 | 164 | 175 | 21 | 209 | 117 | 117 | 206 | 336 |
| Tiao | <i>shang</i> | 33 | 42 | 55 | 74 | 111 | 22 | 97 | 79 | 37 | 0 |
| | <i>qu</i> | 57 | 40 | 80 | 46 | 109 | 47 | 72 | 84 | 63 | 0 |
| | <i>ru</i> | 42 | 44 | 37 | 41 | 95 | 58 | 50 | 56 | 30 | 0 |
| Wang | <i>ping</i> | 66 | 76 | 59 | 58 | 3 | 65 | 33 | 42 | 78 | 114 |
| Rong | <i>shang</i> | 19 | 7 | 12 | 29 | 52 | 12 | 29 | 26 | 14 | 0 |
| | <i>qu</i> | 19 | 15 | 23 | 19 | 34 | 16 | 29 | 26 | 15 | 0 |
| | <i>ru</i> | 10 | 16 | 20 | 8 | 25 | 21 | 23 | 20 | 7 | 0 |

(29) The percentages of the distributions of the four tones in the *ping* rhyming couplets of the Yongming collections

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Shen | <i>ping</i> | 56.82 | 66.76 | 48.58 | 51.14 | 5.11 | 50.85 | 26.42 | 25.00 | 66.48 | 100.0 |
| Yue | <i>shang</i> | 13.64 | 11.36 | 19.03 | 21.02 | 32.67 | 13.92 | 30.11 | 22.73 | 10.23 | 0.00 |
| | <i>qu</i> | 13.92 | 11.08 | 21.31 | 15.34 | 36.08 | 16.48 | 27.56 | 27.27 | 13.92 | 0.00 |
| | <i>ru</i> | 15.63 | 10.80 | 11.08 | 12.50 | 26.14 | 18.75 | 15.91 | 25.00 | 9.38 | 0.00 |
| Xie | <i>ping</i> | 60.71 | 62.50 | 48.81 | 52.08 | 6.25 | 62.20 | 34.82 | 34.82 | 61.31 | 100.0 |
| Tiao | <i>shang</i> | 9.82 | 12.50 | 16.37 | 22.02 | 33.04 | 6.55 | 28.87 | 23.51 | 11.01 | 0.00 |
| | <i>qu</i> | 16.96 | 11.90 | 23.81 | 13.69 | 32.44 | 13.99 | 21.43 | 25.00 | 18.75 | 0.00 |

| | | | | | | | | | | | |
|------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | <i>ru</i> | 12.50 | 13.10 | 11.01 | 12.20 | 28.27 | 17.26 | 14.88 | 16.67 | 8.93 | 0.00 |
| Wang | <i>ping</i> | 57.89 | 66.67 | 51.75 | 50.88 | 2.63 | 57.02 | 28.95 | 36.84 | 68.42 | 100.0 |
| Rong | <i>shang</i> | 16.67 | 6.14 | 10.53 | 25.44 | 45.61 | 10.53 | 25.44 | 22.81 | 12.28 | 0.00 |
| | <i>qu</i> | 16.67 | 13.16 | 20.18 | 16.67 | 29.82 | 14.04 | 25.44 | 22.81 | 13.16 | 0.00 |
| | <i>ru</i> | 8.77 | 14.04 | 17.54 | 7.02 | 21.93 | 18.42 | 20.18 | 17.54 | 6.14 | 0.00 |

Since we have manually categorized the data into two groups based on the tonal categories of the syllables at T10, we will only need to verify whether the tonal distributions are identical at the other nine positions by applying the chi-square test. In the following, I will briefly present the data and the chi-square values from T1 to T9 positions.

(30) The distributions of the four tones at T1

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 200 (206.29) | 204 (196.91) | 66 (66.81) | 470 |
| <i>shang</i> | 48 (43.89) | 33 (41.89) | 19 (14.21) | 100 |
| <i>qu</i> | 49 (54.86) | 57 (52.37) | 19 (17.77) | 125 |
| <i>ru</i> | 55 (46.96) | 42 (44.83) | 10 (15.21) | 107 |
| Column total | 352 | 336 | 114 | 802 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 8.801 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T1.

(31) The distributions of the four tones at T2

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 235 (228.67) | 210 (218.27) | 76 (74.06) | 521 |
| <i>shang</i> | 40 (39.06) | 42 (37.29) | 7 (12.65) | 89 |
| <i>qu</i> | 39 (41.26) | 40 (39.38) | 15 (13.36) | 94 |
| <i>ru</i> | 38 (43.01) | 44 (41.06) | 16 (13.93) | 98 |
| Column total | 352 | 336 | 114 | 802 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 5.119 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T2.

(32) The distributions of the four tones at T3

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 171 (172.93) | 164 (165.07) | 59 (56.00) | 394 |
| <i>shang</i> | 67 (58.81) | 55 (56.14) | 12 (19.05) | 134 |
| <i>qu</i> | 75 (78.13) | 80 (74.57) | 23 (25.30) | 178 |
| <i>ru</i> | 39 (42.13) | 37 (40.22) | 20 (13.65) | 96 |
| Column total | 352 | 336 | 114 | 802 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 8.138 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T3.

(33) The distributions of the four tones at T4

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 180 (181.27) | 175 (173.03) | 58 (58.71) | 413 |
| <i>shang</i> | 74 (77.68) | 74 (74.15) | 29 (25.16) | 177 |
| <i>qu</i> | 54 (52.23) | 46 (49.86) | 19 (16.91) | 119 |
| <i>ru</i> | 44 (40.82) | 41 (38.96) | 8 (13.22) | 93 |
| Column total | 352 | 336 | 114 | 802 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 3.832 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T4.

(34) The distributions of the four tones at T5

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 18 (18.43) | 21 (17.59) | 3 (5.97) | 42 |
| <i>shang</i> | 115 (122.02) | 111 (116.47) | 52 (39.52) | 278 |
| <i>qu</i> | 127 (118.50) | 109 (113.12) | 34 (38.38) | 270 |
| <i>ru</i> | 92 (93.05) | 95 (88.82) | 25 (30.13) | 212 |
| Column total | 352 | 336 | 114 | 802 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 9.326 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T5.

(35) The distributions of the four tones at T6

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 179 (198.82) | 209 (189.79) | 65 (64.39) | 453 |
| <i>shang</i> | 49 (36.43) | 22 (34.77) | 12 (11.80) | 83 |
| <i>qu</i> | 58 (53.11) | 47 (50.69) | 16 (17.20) | 121 |
| <i>ru</i> | 66 (63.64) | 58 (60.75) | 21 (20.61) | 145 |
| Column total | 352 | 336 | 114 | 802 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 13.983 > 12.592$$

There is a significant difference among these three poets in the tonal distribution at T6.

(36) The distributions of the four tones at T7

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 93 (106.65) | 117 (101.81) | 33 (34.54) | 243 |
| <i>shang</i> | 106 (101.83) | 97 (97.20) | 29 (32.98) | 232 |
| <i>qu</i> | 97 (86.90) | 72 (82.95) | 29 (28.14) | 198 |
| <i>ru</i> | 56 (56.62) | 50 (54.04) | 23 (18.34) | 129 |
| Column total | 352 | 336 | 114 | 802 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 8.876 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T7.

(37) The distributions of the four tones at T8

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|-------------|--------------|------------|-----------|
| <i>ping</i> | 88 (108.41) | 117 (103.48) | 42 (35.11) | 247 |
| <i>shang</i> | 80 (81.20) | 79 (77.51) | 26 (26.30) | 185 |
| <i>qu</i> | 96 (90.41) | 84 (86.30) | 26 (29.28) | 206 |
| <i>ru</i> | 88 (71.98) | 56 (68.71) | 20 (23.31) | 164 |
| Column total | 352 | 336 | 114 | 802 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 14.171 > 12.592$$

There is a significant difference among these three poets in the tonal distribution at T8.

(38) The distributions of the four tones at T9

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 234 (227.35) | 206 (217.02) | 78 (73.63) | 518 |
| <i>shang</i> | 36 (38.19) | 37 (36.45) | 14 (12.37) | 87 |
| <i>qu</i> | 49 (55.74) | 63 (53.21) | 15 (18.05) | 127 |
| <i>ru</i> | 33 (30.72) | 30 (29.32) | 7 (9.95) | 70 |
| Column total | 352 | 336 | 114 | 802 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 5.555 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T9.

In summary, the distributions of the four tones are identical at T1, T2, T3, T4, T5, T7, and T9 in the *ping* rhyming couplets among the Yongming collections, and significant differences can only be found at T6 and T8.

3.3.4 The distributions of the four tones in the *ze* rhyming couplets

The following tables respectively present the frequencies and the percentages of the distributions of the four tones in the *ze* rhyming couplets of the Yongming collections.

(39) The frequencies of the distributions of the four tones in the *ze* rhyming couplets of the Yongming collections

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Shen | <i>ping</i> | 100 | 99 | 88 | 117 | 119 | 151 | 145 | 104 | 153 | 0 |
| | <i>shang</i> | 37 | 39 | 42 | 38 | 45 | 17 | 29 | 55 | 34 | 33 |
| Yue | <i>qu</i> | 35 | 38 | 51 | 31 | 21 | 18 | 29 | 37 | 20 | 77 |
| | <i>ru</i> | 40 | 36 | 31 | 26 | 27 | 26 | 9 | 16 | 5 | 102 |
| Xie | <i>ping</i> | 201 | 156 | 159 | 220 | 229 | 268 | 229 | 183 | 258 | 0 |
| Tiao | <i>shang</i> | 54 | 82 | 72 | 57 | 59 | 28 | 66 | 64 | 74 | 101 |
| | <i>qu</i> | 59 | 75 | 86 | 68 | 48 | 37 | 57 | 96 | 30 | 125 |
| | <i>ru</i> | 65 | 66 | 62 | 34 | 43 | 46 | 27 | 36 | 17 | 153 |

| | | | | | | | | | | | | |
|------|-------------|--------------|----|----|----|----|----|----|----|----|---|----|
| Wang | <i>ping</i> | 32 | 24 | 22 | 37 | 41 | 43 | 43 | 26 | 51 | 0 | |
| | Rong | <i>shang</i> | 11 | 15 | 16 | 10 | 11 | 6 | 7 | 16 | 6 | 19 |
| | | <i>qu</i> | 9 | 14 | 11 | 13 | 7 | 6 | 10 | 18 | 7 | 14 |
| | | <i>ru</i> | 13 | 12 | 16 | 5 | 6 | 10 | 5 | 5 | 1 | 32 |

(40) The percentages of the distributions of the four tones in the *ze* rhyming couplets of the Yongming collections

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 | |
|------|-------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Shen | <i>ping</i> | 47.17 | 46.70 | 41.51 | 55.19 | 56.13 | 71.23 | 68.40 | 49.06 | 72.17 | 0.00 | |
| | Yue | <i>shang</i> | 17.45 | 18.40 | 19.81 | 17.92 | 21.23 | 8.02 | 13.68 | 25.94 | 16.04 | 15.57 |
| | | <i>qu</i> | 16.51 | 17.92 | 24.06 | 14.62 | 9.91 | 8.49 | 13.68 | 17.45 | 9.43 | 36.32 |
| | | <i>ru</i> | 18.87 | 16.98 | 14.62 | 12.26 | 12.74 | 12.26 | 4.25 | 7.55 | 2.36 | 48.11 |
| Xie | <i>ping</i> | 53.03 | 41.16 | 41.95 | 58.05 | 60.42 | 70.71 | 60.42 | 48.28 | 68.07 | 0.00 | |
| | Tiao | <i>shang</i> | 14.25 | 21.64 | 19.00 | 15.04 | 15.57 | 7.39 | 17.41 | 16.89 | 19.53 | 26.65 |
| | | <i>qu</i> | 15.57 | 19.79 | 22.69 | 17.94 | 12.66 | 9.76 | 15.04 | 25.33 | 7.92 | 32.98 |
| | | <i>ru</i> | 17.15 | 17.41 | 16.36 | 8.97 | 11.35 | 12.14 | 7.12 | 9.50 | 4.49 | 40.37 |
| Wang | <i>ping</i> | 49.23 | 36.92 | 33.85 | 56.92 | 63.08 | 66.15 | 66.15 | 40.00 | 78.46 | 0.00 | |
| | Rong | <i>shang</i> | 16.92 | 23.08 | 24.62 | 15.38 | 16.92 | 9.23 | 10.77 | 24.62 | 9.23 | 29.23 |
| | | <i>qu</i> | 13.85 | 21.54 | 16.92 | 20.00 | 10.77 | 9.23 | 15.38 | 27.69 | 10.77 | 21.54 |

| | | | | | | | | | | | |
|--|-----------|-------|-------|-------|------|------|-------|------|------|------|-------|
| | <i>ru</i> | 20.00 | 18.46 | 24.62 | 7.69 | 9.23 | 15.38 | 7.69 | 7.69 | 1.54 | 49.23 |
|--|-----------|-------|-------|-------|------|------|-------|------|------|------|-------|

Then I will briefly present the data and the chi-square values from T1 to T9 positions in the following.

(41) The distributions of the four tones at T1

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 100 (107.62) | 201 (192.39) | 32 (32.99) | 333 |
| <i>shang</i> | 37 (32.96) | 54 (58.93) | 11 (10.11) | 102 |
| <i>qu</i> | 35 (33.29) | 59 (59.51) | 9 (10.21) | 103 |
| <i>ru</i> | 40 (38.13) | 65 (68.17) | 13 (11.69) | 118 |
| Column total | 212 | 379 | 65 | 656 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 2.560 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T1.

(42) The distributions of the four tones at T2

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|------------|--------------|------------|-----------|
| <i>ping</i> | 99 (90.17) | 156 (161.19) | 24 (27.64) | 279 |
| <i>shang</i> | 39 (43.95) | 82 (78.57) | 15 (13.48) | 136 |

| | | | | |
|--------------|------------|------------|------------|-----|
| <i>qu</i> | 38 (41.04) | 75 (73.38) | 14 (12.58) | 127 |
| <i>ru</i> | 36 (36.84) | 66 (65.86) | 12 (11.30) | 114 |
| Column total | 212 | 379 | 65 | 656 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 2.878 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T2.

(43) The distributions of the four tones at T3

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|------------|--------------|------------|-----------|
| <i>ping</i> | 88 (86.93) | 159 (155.41) | 22 (26.65) | 269 |
| <i>shang</i> | 42 (42.01) | 72 (75.11) | 16 (12.88) | 130 |
| <i>qu</i> | 51 (47.83) | 86 (85.51) | 11 (14.67) | 148 |
| <i>ru</i> | 31 (35.23) | 62 (62.97) | 16 (10.80) | 109 |
| Column total | 212 | 379 | 65 | 656 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 5.946 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T3.

(44) The distributions of the four tones at T4

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|-------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 117 (120.87) | 220 (216.08) | 37 (37.06) | 374 |

| | | | | |
|--------------|------------|------------|------------|-----|
| <i>shang</i> | 38 (33.93) | 57 (60.66) | 10 (10.40) | 105 |
| <i>qu</i> | 31 (36.20) | 68 (64.71) | 13 (11.10) | 112 |
| <i>ru</i> | 26 (21.00) | 34 (37.55) | 5 (6.44) | 65 |
| Column total | 212 | 379 | 65 | 656 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 4.00 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T4.

(45) The distributions of the four tones at T5

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 119 (125.71) | 229 (224.74) | 41 (38.54) | 389 |
| <i>shang</i> | 45 (37.17) | 59 (66.44) | 11 (11.40) | 115 |
| <i>qu</i> | 21 (24.56) | 48 (43.91) | 7 (7.53) | 76 |
| <i>ru</i> | 27 (24.56) | 43 (43.91) | 6 (7.53) | 76 |
| Column total | 212 | 379 | 65 | 656 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 4.601 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T5.

(46) The distributions of the four tones at T6

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 151 (149.31) | 268 (266.92) | 43 (45.78) | 462 |
| <i>shang</i> | 17 (16.48) | 28 (29.46) | 6 (5.05) | 51 |
| <i>qu</i> | 18 (19.71) | 37 (35.24) | 6 (6.04) | 61 |
| <i>ru</i> | 26 (26.50) | 46 (47.38) | 10 (8.13) | 82 |
| Column total | 212 | 379 | 65 | 656 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 1.178 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T6.

(47) The distributions of the four tones at T7

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 145 (134.76) | 229 (240.92) | 43 (41.32) | 417 |
| <i>shang</i> | 29 (32.96) | 66 (58.93) | 7 (10.11) | 102 |
| <i>qu</i> | 29 (31.03) | 57 (55.46) | 10 (9.51) | 96 |
| <i>ru</i> | 9 (13.25) | 27 (23.69) | 5 (4.06) | 41 |
| Column total | 212 | 379 | 65 | 656 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 5.96 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T7.

(48) The distributions of the four tones at T8

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 104 (101.15) | 183 (180.83) | 26 (31.01) | 313 |
| <i>shang</i> | 55 (43.63) | 64 (78.00) | 16 (13.38) | 135 |
| <i>qu</i> | 37 (48.80) | 96 (87.24) | 18 (14.96) | 151 |
| <i>ru</i> | 16 (18.42) | 36 (32.93) | 5 (5.65) | 57 |
| Column total | 212 | 379 | 65 | 656 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 11.934 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T8.

(49) The distributions of the four tones at T9

| | Shen Yue | Xie Tiao | Wang Rong | Row total |
|--------------|--------------|--------------|------------|-----------|
| <i>ping</i> | 153 (149.30) | 258 (266.92) | 51 (45.78) | 462 |
| <i>shang</i> | 34 (36.84) | 74 (65.86) | 6 (11.29) | 114 |
| <i>qu</i> | 20 (18.42) | 30 (32.93) | 7 (5.65) | 57 |
| <i>ru</i> | 5 (7.43) | 17 (13.29) | 1 (2.28) | 23 |
| Column total | 212 | 379 | 65 | 656 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 7.963 < 12.592$$

There is no significant difference among these three poets in the tonal distribution at T9.

In summary, the distributions of the four tones are identical at all positions except T10 in the *ze* rhyming couplets among the Yongming collections.

3.3.5 Summary

In the previous sections, I have conducted four sets of chi-square tests in the Yongming collections to investigate 1) whether the *ping-ze* distributions at a certain position are identical; 2) whether the distributions of four tones at a certain position are identical; 3) whether the distributions of four tones at a certain position of the *ping* rhyming couplets are identical; and 4) whether the distributions of four tones at a certain position of the *ze* rhyming couplets are identical. The results show that 1) there are 5 positions where the *ping-ze* distributions are identical; 2) there are 6 positions where the distributions of four tones are identical; 3) there are 7 positions where the distributions of four tones in the *ping* rhyming couplets are identical; and 4) there are 9 positions where the distributions of four tones in the *ze* rhyming couplets are identical. The results can be summarized in (50).

(50) The positions where the tonal distributions are identical in the Yongming collections

| | | | | |
|-----------|-----------|-----------|-----------|-----|
| <u>T1</u> | T2 | <u>T3</u> | <u>T4</u> | T5 |
| ▲ | ▲ | ▲ | ▲ | |
| P | P | P | P | P |
| Z | Z | Z | Z | Z |
| T6 | <u>T7</u> | T8 | <u>T9</u> | T10 |
| | ▲ | | ▲ | |
| | P | | P | |
| | Z | Z | Z | |

(50) summaries the positions where the tonal distributions are identical. Underlines mark those positions where the *ping-ze* distributions are identical. Triangles mark those positions where the distributions of the four tones are identical. “P” marks those positions where the distributions of the four tones are identical in the *ping* rhyming couplets. And “Z” marks those positions where the distributions of the four tones are identical in the *ze* rhyming couplets. In Section 3.3.2, we conclude that the positions where the distributions of the four tones are identical are more than the positions where the *ping-ze* distributions are identical, which may indicate that the tonal prosodic rules of the Yongming style verse were based on the four tones instead of the two tonal categories, *ping* and *ze*. We also point out that the above conclusion may be not well-grounded because the difference is subtle. However, after dividing the data into two groups according to the tonal categories in the rhyming positions, we can see that the distributions of the four tones in most positions are the same. The results indicate that in the Yongming era, the poetic tonal prosodic rules were built based on the four tones, but the poets began to have the awareness to create the binary tonal contrast, *ping* versus *ze*, at the rhyming positions.

3.4 The *Ping-ze* Distribution in the Early Tang Collections

The following tables respectively present the frequencies and the percentages of the *ping-ze* distribution in the collections of Shangguan Yi, Du Shenyan, Shen Quanqi, and

Song Zhiwen.

(51) The frequencies of the *ping-ze* distribution in the early Tang collections

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|-----------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Shangguan | <i>ping</i> | 18 | 23 | 40 | 32 | 2 | 36 | 24 | 11 | 25 | 48 |
| Yi | <i>ze</i> | 31 | 26 | 9 | 17 | 47 | 13 | 25 | 38 | 24 | 1 |
| Du | <i>ping</i> | 75 | 108 | 180 | 112 | 4 | 156 | 103 | 7 | 109 | 212 |
| Shenyan | <i>ze</i> | 137 | 104 | 32 | 100 | 208 | 56 | 109 | 205 | 103 | 0 |
| Shen | <i>ping</i> | 262 | 302 | 489 | 329 | 24 | 488 | 290 | 50 | 308 | 597 |
| Quanqi | <i>ze</i> | 335 | 295 | 108 | 268 | 573 | 109 | 307 | 547 | 289 | 0 |
| Song | <i>ping</i> | 283 | 328 | 477 | 372 | 35 | 492 | 316 | 83 | 333 | 645 |
| Zhiwen | <i>ze</i> | 364 | 319 | 170 | 275 | 612 | 155 | 331 | 564 | 314 | 2 |

(52) The percentages of the *ping-ze* distribution in the early Tang collections

| | | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|-----------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Shangguan | <i>ping</i> | 36.73 | 46.94 | 81.63 | 65.31 | 4.08 | 73.47 | 48.98 | 22.45 | 51.02 | 97.96 |
| Yi | <i>ze</i> | 63.27 | 53.06 | 18.37 | 34.69 | 95.92 | 26.53 | 51.02 | 77.55 | 48.98 | 2.04 |
| Du | <i>ping</i> | 35.38 | 50.94 | 84.91 | 52.83 | 1.89 | 73.58 | 48.58 | 3.30 | 51.42 | 100.0 |
| Shenyan | <i>ze</i> | 64.62 | 49.06 | 15.09 | 47.17 | 98.11 | 26.42 | 51.42 | 96.70 | 48.58 | 0.00 |

| | | | | | | | | | | | |
|--------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Shen | <i>ping</i> | 43.89 | 50.59 | 81.91 | 55.11 | 4.02 | 81.74 | 48.58 | 8.38 | 51.59 | 100.0 |
| Quanqi | <i>ze</i> | 56.11 | 49.41 | 18.09 | 44.89 | 95.98 | 18.26 | 51.42 | 91.62 | 48.41 | 0.00 |
| Song | <i>ping</i> | 43.74 | 50.70 | 73.72 | 57.50 | 5.41 | 76.04 | 48.84 | 12.83 | 51.47 | 99.69 |
| Zhiwen | <i>ze</i> | 56.26 | 49.30 | 26.28 | 42.50 | 94.59 | 23.96 | 51.16 | 87.17 | 48.53 | 0.31 |

Then I will briefly present the data and the chi-square values from T1 to T10 positions in the following. In this study, the value of df is 3, and thus the critical value $\chi^2_{0.05}(3) = 7.815$.

(53) The *ping-ze* distributions at T1

| | Shangguan Yi | Du Shenyang | Shen Quanqi | Song Zhiwen | Row total |
|--------------|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 18 (20.77) | 75 (89.87) | 262 (253.08) | 283 (274.28) | 638 |
| <i>ze</i> | 31 (28.23) | 137 (122.13) | 335 (343.92) | 364 (372.72) | 867 |
| Column total | 49 | 212 | 597 | 647 | 1505 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 5.941 < 7.815$$

There is no significant difference among these poets in the *ping-ze* distribution at T1.

(54) The *ping-ze* distributions at T2

| | Shangguan Yi | Du Shenyang | Shen Quanqi | Song Zhiwen | Row total |
|-------------|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 23 (24.78) | 108 (107.20) | 302 (301.87) | 328 (327.15) | 761 |

| | | | | | |
|--------------|------------|--------------|--------------|--------------|------|
| <i>ze</i> | 26 (24.22) | 104 (104.80) | 295 (295.13) | 319 (319.85) | 744 |
| Column total | 49 | 212 | 597 | 647 | 1505 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 0.274 < 7.815$$

There is no significant difference among these poets in the *ping-ze* distribution at T2.

(55) The *ping-ze* distributions at T3

| | | | | | |
|--------------|--------------|--------------|--------------|--------------|-----------|
| | Shangguan Yi | Du Shenyang | Shen Quanqi | Song Zhiwen | Row total |
| <i>ping</i> | 40 (38.61) | 180 (167.06) | 489 (470.46) | 477 (509.86) | 1186 |
| <i>ze</i> | 9 (10.39) | 32 (44.94) | 108 (126.54) | 170 (137.14) | 319 |
| Column total | 49 | 212 | 597 | 647 | 1505 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 18.400 > 7.815$$

There is a significant difference among these poets in the *ping-ze* distribution at T3.

(56) The *ping-ze* distributions at T4

| | | | | | |
|--------------|--------------|--------------|--------------|--------------|-----------|
| | Shangguan Yi | Du Shenyang | Shen Quanqi | Song Zhiwen | Row total |
| <i>ping</i> | 32 (27.51) | 112 (119.03) | 329 (335.19) | 372 (363.27) | 845 |
| <i>ze</i> | 17 (21.49) | 100 (92.97) | 268 (261.81) | 275 (283.73) | 660 |
| Column total | 49 | 212 | 597 | 647 | 1505 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 3.356 < 7.815$$

There is no significant difference among these poets in the *ping-ze* distribution at T4.

(57) The *ping-ze* distributions at T5

| | Shangguan Yi | Du Shenyang | Shen Quanqi | Song Zhiwen | Row total |
|--------------|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 2 (2.12) | 4 (9.16) | 24 (25.78) | 35 (27.94) | 65 |
| <i>ze</i> | 47 (46.88) | 208 (202.84) | 573 (571.22) | 612 (619.06) | 1440 |
| Column total | 49 | 212 | 597 | 647 | 1505 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 5.033 < 7.815$$

There is no significant difference among these poets in the *ping-ze* distribution at T5.

(58) The *ping-ze* distributions at T6

| | Shangguan Yi | Du Shenyang | Shen Quanqi | Song Zhiwen | Row total |
|--------------|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 36 (38.16) | 156 (165.09) | 488 (464.91) | 492 (503.84) | 1172 |
| <i>ze</i> | 13 (10.84) | 56 (46.91) | 109 (132.09) | 155 (143.16) | 333 |
| Column total | 49 | 212 | 597 | 647 | 1505 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 9.258 > 7.815$$

There is a significant difference among these poets in the *ping-ze* distribution at T6.

(59) The *ping-ze* distributions at T7

| | Shangguan Yi | Du Shenyang | Shen Quanqi | Song Zhiwen | Row total |
|-------------|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 24 (23.87) | 103 (103.25) | 290 (290.76) | 316 (315.12) | 733 |

| | | | | | |
|--------------|------------|--------------|--------------|--------------|------|
| <i>ze</i> | 25 (25.13) | 109 (108.75) | 307 (306.24) | 331 (331.88) | 772 |
| Column total | 49 | 212 | 597 | 647 | 1505 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 0.011 < 7.815$$

There is no significant difference among these poets in the *ping-ze* distribution at T7.

(60) The *ping-ze* distributions at T8

| | | | | | |
|--------------|--------------|--------------|--------------|--------------|-----------|
| | Shangguan Yi | Du Shenyang | Shen Quanqi | Song Zhiwen | Row total |
| <i>ping</i> | 11 (4.92) | 7 (21.27) | 50 (59.90) | 83 (64.91) | 151 |
| <i>ze</i> | 38 (44.08) | 205 (190.73) | 547 (537.10) | 564 (582.09) | 1354 |
| Column total | 49 | 212 | 597 | 647 | 1505 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 26.43 > 7.815$$

There is a significant difference among these poets in the *ping-ze* distribution at T8.

(61) The *ping-ze* distributions at T9

| | | | | | |
|--------------|--------------|--------------|--------------|--------------|-----------|
| | Shangguan Yi | Du Shenyang | Shen Quanqi | Song Zhiwen | Row total |
| <i>ping</i> | 25 (25.23) | 109 (109.17) | 308 (307.43) | 333 (333.17) | 775 |
| <i>ze</i> | 24 (23.77) | 103 (102.83) | 289 (289.57) | 314 (313.83) | 730 |
| Column total | 49 | 212 | 597 | 647 | 1505 |

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 0.007 < 7.815$$

There is no significant difference among these poets in the *ping-ze* distribution at T9.

(62) The *ping-ze* distributions at T10

| | Shangguan Yi | Du Shenyan | Shen Quanqi | Song Zhiwen | Row total |
|--------------|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 48 (48.90) | 212 (211.58) | 597 (595.81) | 645 (645.71) | 1502 |
| <i>ze</i> | 1 (0.10) | 0 (0.42) | 0 (1.19) | 2 (1.29) | 3 |
| Column total | 49 | 212 | 597 | 647 | 1505 |

$$\chi^2 = \sum \frac{(|f_o - f_e| - 0.5)^2}{f_e} = 2.11 < 7.815^{20}$$

There is no significant difference among these poets in the *ping-ze* distribution at T10.

In summary, the *ping-ze* distributions at T1, T2, T4, T5, T7, T9, and T10 are identical among the early Tang collections, and the *ping-ze* distributions are different at T3, T6, and T8. When comparing the results with the Yongming collections where the *ping-ze* distributions are identical at five positions, it is obvious that most positions in the early Tang collections have the same *ping-ze* distribution, which indicates that the *ping-ze* binary contrast had been established in the early Tang. The different *ping-ze* distributions at T3, T6, and T8 could be the result of the “1-3-5 rule” or “*ao-jiu*” theory that poets comparatively have more freedom in the tonal selection at the first and third positions of a line.

²⁰ The chi-square test formula used in (62) is Yate’s corrected version of Pearson’s chi-squared statistics. It is used when at least one of the cells in the table has an expected value smaller than 5.

Chapter 4. Pair-wise Tonal Contrasts

4.1 Pair-wise Tonal Contrasts in *Bunkyō hifuron*

Bunkyō hifuron 文鏡秘府論, compiled by Japanese monk Kūkai (774-835) in the early ninth century, is an existing historical document of great value which records the theories of classical Chinese poetics and prosody from the period of the Six Dynasties to the Tang dynasty. The work is titled “A Mirror on Literature and a Treasury of Marvels Treatise” (Buswell and Lopez, 2013:796) and it aims to serve as the thesaurus for Japanese monks to compose the Recent-style verse conforming to the rules and forms. The treatise extracts original Chinese sources, such as Cui Rong’s 崔融 (653-706) *Tangchao xinding shiti* 唐朝新定詩體 (The Newly Formed Poetic Style of the Tang Dynasty), Wang Changling’s 王昌齡 (698-757) *Shi ge* 詩格 (The Style of Poems), and Yuan Jing’s 元競 (?-?) *Shi naosui* 詩腦髓 (The Essence of Poems), many of which are lost. Therefore, it is a valuable source to study the Recent-style verse.

The work is divided into six volumes, namely “Tian” 天 (Heaven), “Di” 地 (Earth), “Dong” 東 (East), “Nan” 南 (South), “Xi” 西 (West), and “Bei” 北 (North). The West volume lists 28 defects that poets should avoid when creating poems, nine of which concern the pair-wise tonal contrasts. They are *pingtou* 平頭, *shangwei* 上尾, *fengyao* 蜂腰, *hexi* 鶴膝, *shuihun* 水渾, *huomie* 火滅, *muku* 木枯, *jinque* 金缺, and *juyu* 齟齬,

respectively concerning the following pair-wise contrasts: T1T2-T6T7, T5-T10, T2-T5, T5-T15, T1-T6, T2-T7, T3-T8, T4-T9, and T2-T3 or T3-T4. In the following sections, I will examine these pair-wise contrasts in different poets' collections and to find out how these pair-wise contrasts developed diachronically. When analyzing the data, I set this criterion: if the rates of a certain tonal contrast exceed 95% and are identical in the collections of the same period, then this tonal contrast will be considered as a strict rule of that period.

4.2 Pair-wise Contrasts within a Line

Among the nine defects mentioned in the last section, two of them, *fengyao* and *juyu*, are related to pair-wise contrasts within a line. In *Bunokyō hifuron*, these two defects are described as follows.

(1) The description of *fengyao* and *juyu* in *Bunokyō hifuron*

蜂腰詩者，五言詩一句之中，第二字不得與第五字同聲。

如第二字與第五字同上去入，皆是病，平聲非病也。

又第二字與第四字同聲，亦不能善。

Fengyao requires that in pentasyllabic poems, the second syllable and the fifth syllable within a line have different tones.

If the second syllable and the fifth syllable both have either a *shang*, *qu* or *ru* tone, then it is a defect. [If they both have] a *ping* tone, it is not a defect.

And [if] the second and the fourth syllables have the same tone, it is also not good.

齟齬病者，一句之內，除第一字及第五字，其中三字，有二字相連，同上去入是。

元兢曰：“平聲不成病，上去入是重病，文人悟之者少，故此病無其名。”

[The pome that has] *juyu* defect [is like this:] except the first and the fifth syllables within a line, two consecutive syllables among the middle three syllables both have either a *shang*, *qu* or *ru* tone. Yuan Jing said, “[If they have a] *ping* tone, it is not a defect; if they have either a *shang*, *qu* or *ru* tone, it is a serious defect. Literatus who understand this are few, so this defect is rarely known.

The above statements mainly discuss two issues concerning the tonal contrasts within a line: the syllable positions and tonal categories. There are in total four pairs of tonal contrasts mentioned above, T2-T4, T2-T5, T2-T3, and T3-T4. Syllables in these pair-wise positions should have different tones, otherwise they will be considered defective. However, compared with *shang*, *qu*, and *ru*, *ping* enjoys a unique status as it will not be regarded as a defect if syllables have a *ping* tone in those positions. In the following sections I will examine the tonal contrasts in these positions diachronically, from the Yongming era to the high Tang period.

4.2.1 Tonal contrasts in T2-T4

(2) The frequencies of the tonal contrasts in T2-T4

| | Total couplets | | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T2=T4 | T2≠T4 |
|--------------|----------------|--------|------------------|--------------------|--------------|--------------|-------|-------|
| Shen Yue | 564 | Upper | 140 | 4 | 4 | 4 | 152 | 412 |
| | | Bottom | 105 | 0 | 2 | 1 | 108 | 456 |
| Xie Tiao | 715 | Upper | 142 | 10 | 4 | 1 | 157 | 558 |
| | | Bottom | 140 | 2 | 1 | 1 | 144 | 571 |
| Wang Rong | 179 | Upper | 36 | 3 | 3 | 1 | 43 | 136 |
| | | Bottom | 38 | 2 | 2 | 0 | 42 | 137 |
| Xue Daoheng | 107 | Upper | 13 | 0 | 0 | 0 | 13 | 94 |
| | | Bottom | 6 | 0 | 0 | 0 | 6 | 101 |
| Shangguan Yi | 49 | Upper | 6 | 0 | 0 | 0 | 6 | 43 |
| | | Bottom | 0 | 0 | 0 | 0 | 0 | 49 |
| Du Shenyang | 212 | Upper | 9 | 0 | 0 | 0 | 9 | 203 |
| | | Bottom | 0 | 0 | 0 | 0 | 0 | 212 |
| Shen Quanqi | 597 | Upper | 43 | 1 | 2 | 3 | 49 | 548 |
| | | Bottom | 6 | 0 | 1 | 0 | 7 | 590 |
| Song | 647 | Upper | 73 | 4 | 4 | 1 | 82 | 565 |

| | | | | | | | | |
|-------------|-----|--------|-------|------|------|------|-------|-------|
| Shen Quanqi | 597 | Upper | 7.20 | 0.17 | 0.34 | 0.50 | 8.21 | 91.79 |
| | | Bottom | 1.01 | 0.00 | 0.17 | 0.00 | 1.17 | 98.83 |
| Song Zhiwen | 647 | Upper | 11.28 | 0.62 | 0.62 | 0.15 | 12.67 | 87.33 |
| | | Bottom | 1.39 | 0.15 | 0.62 | 0.00 | 2.16 | 97.84 |
| TSSBS | 288 | Upper | 13.19 | 0.35 | 1.39 | 0.00 | 14.93 | 85.07 |
| | | Bottom | 3.47 | 0.00 | 0.69 | 0.00 | 4.17 | 95.83 |

The above tables present the T2-T4 tonal contrast in the upper line and the bottom line of a couplet respectively. In the three Yongming poets' collections, about 70% to 80% of the lines have different tones in the T2 and T4 positions, and the distinctions between the upper line and the bottom line are subtle, except for Shen Yue's collection. The proportions of the T2-T4 tonal contrast in the collections of the Sui and Tang dynasties increase to the range of 80% to 100%, and clearly, there are more T2-T4 tonal contrasts in the bottom lines than those in the upper lines. To verify whether there is a significant difference between the T2-T4 contrast rate in the upper line and that in the bottom line in a certain collection, we can conduct chi-square test. The results are summarized in (4). Based on the results, we can conclude that in the Tang collections (including Shangguan Yi, Du Shenyang, Shen Quanqi, Song Zhiwen, and TSSBS), there are significant differences between the T2-T4 contrast rate in the upper line and that in the bottom line.

(4) Chi-square values in the Tang collections

| | χ^2 | Compared to 3.84 ($p=0.05$, $df=1$) |
|--------------|----------|--|
| Xue Daoheng | 2.830 | < (no significant difference) |
| Shangguan Yi | 4.438 | > (have a significant difference) |
| Du Shenyan | 7.265 | > (have a significant difference) |
| Shen Quanqi | 33.050 | > (have a significant difference) |
| Song Zhiwen | 52.026 | > (have a significant difference) |
| TSSBS | 19.317 | > (have a significant difference) |

Another observation is that, in the four early Tang collections (Shangguan Yi, Du Shenyan, Shen Quanqi, and Song Zhiwen), the T2-T4 tonal contrast rates in the bottom line approximate 100%. If the proportions of a certain tonal contrast pair are identically high in different poets of the same period, then we can assume that this tonal contrast was a strict rule at that time.

(5) Chi-square test on the T2-T4 tonal contrast in the bottom line in the early Tang collections

| | Observed frequency | | Expected frequency | |
|--|--------------------|-------|--------------------|-------|
| | T2=T4 | T2≠T4 | T2=T4 | T2≠T4 |
| | | | | |

| | | | | |
|--------------|---|-----|---|-----|
| Shangguan Yi | 0 | 49 | 1 | 48 |
| Du Shenyang | 0 | 212 | 3 | 209 |
| Shen Quanqi | 7 | 590 | 8 | 589 |
| Song Zhiwen | 14 | 633 | 9 | 638 |
| χ^2 | 4.452 < 7.81 ($p=0.05$, $df=3$), no significant difference | | | |

The above chi-square test verified that there is no significant difference among the four early Tang collections in terms of the T2-T4 tonal contrast rate in the bottom line. Therefore, we can propose that in the early Tang, the T2-T4 tonal contrast in the bottom line is a strict rule.

Overall speaking, there is a tendency in all the collections for the second and the fourth syllables to have different tones, and it became a strict rule for the bottom line of a couplet in the early Tang. It is also noticeable that among the syllables which have identical tones at T2 and T4, the majority have *ping* tones. In other words, although having identical tones at T2 and T4 is generally not allowed, it may not be a serious defect to have a *ping* tone at T2 and another *ping* tone at T4,

4.2.2 Tonal contrasts in T2-T5

(6) The frequencies of the tonal contrasts in T2-T5

| | Total couplets | | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T2=T5 | T2≠T5 |
|--------------|----------------|--------|------------------|--------------------|--------------|--------------|-------|-------|
| Shen Yue | 564 | Upper | 43 | 7 | 6 | 2 | 58 | 506 |
| | | Bottom | 93 | 0 | 3 | 2 | 98 | 466 |
| Xie Tiao | 715 | Upper | 68 | 2 | 9 | 4 | 83 | 632 |
| | | Bottom | 117 | 5 | 4 | 2 | 128 | 587 |
| Wang Rong | 179 | Upper | 9 | 2 | 1 | 0 | 12 | 167 |
| | | Bottom | 33 | 2 | 1 | 1 | 37 | 142 |
| Xue Daoheng | 107 | Upper | 5 | 1 | 2 | 2 | 10 | 97 |
| | | Bottom | 30 | 0 | 1 | 2 | 33 | 74 |
| Shangguan Yi | 49 | Upper | 0 | 0 | 2 | 2 | 4 | 45 |
| | | Bottom | 23 | 0 | 0 | 0 | 23 | 26 |
| Du Shenyan | 212 | Upper | 1 | 1 | 3 | 1 | 6 | 206 |
| | | Bottom | 103 | 0 | 0 | 0 | 103 | 109 |
| Shen Quanqi | 597 | Upper | 8 | 3 | 13 | 2 | 26 | 571 |
| | | Bottom | 290 | 0 | 0 | 0 | 290 | 307 |
| Song Zhiwen | 647 | Upper | 7 | 10 | 13 | 8 | 38 | 609 |

| | | | | | | | | |
|-------|-----|--------|-----|---|----|---|-----|-----|
| | | Bottom | 315 | 0 | 0 | 0 | 315 | 332 |
| TSSBS | 288 | Upper | 7 | 9 | 17 | 2 | 35 | 253 |
| | | Bottom | 134 | 2 | 1 | 0 | 137 | 151 |

(7) The percentages of the tonal contrasts in T2-T5

| | Total couplets | | <i>ping-</i> <i>ping</i> | <i>shang-</i> <i>shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T2=T5 | T2≠T5 |
|-----------------|-------------------|--------|-----------------------------|-------------------------------|--------------|--------------|-------|-------|
| Shen Yue | 564 | Upper | 7.62 | 1.24 | 1.06 | 0.35 | 10.28 | 89.72 |
| | | Bottom | 16.49 | 0.00 | 0.53 | 0.35 | 17.38 | 82.62 |
| Xie Tiao | 715 | Upper | 9.51 | 0.28 | 1.26 | 0.56 | 11.61 | 88.39 |
| | | Bottom | 16.36 | 0.70 | 0.56 | 0.28 | 17.90 | 82.10 |
| Wang Rong | 179 | Upper | 5.03 | 1.12 | 0.56 | 0.00 | 6.70 | 93.30 |
| | | Bottom | 18.44 | 1.12 | 0.56 | 0.56 | 20.67 | 79.33 |
| Xue Daoheng | 107 | Upper | 4.67 | 0.93 | 1.87 | 1.87 | 9.35 | 90.65 |
| | | Bottom | 28.04 | 0.00 | 0.93 | 1.87 | 30.84 | 69.16 |
| Shangguan Yi | 49 | Upper | 0.00 | 0.00 | 4.08 | 4.08 | 8.16 | 91.84 |
| | | Bottom | 46.94 | 0.00 | 0.00 | 0.00 | 46.94 | 53.06 |
| Du Shenyan | 212 | Upper | 0.47 | 0.47 | 1.42 | 0.47 | 2.83 | 97.17 |
| | | Bottom | 48.58 | 0.00 | 0.00 | 0.00 | 48.58 | 51.42 |

| | | | | | | | | |
|-------------|-----|--------|-------|------|------|------|-------|-------|
| Shen Quanqi | 597 | Upper | 1.34 | 0.50 | 2.18 | 0.34 | 4.36 | 95.64 |
| | | Bottom | 48.58 | 0.00 | 0.00 | 0.00 | 48.58 | 51.42 |
| Song Zhiwen | 647 | Upper | 1.08 | 1.55 | 2.01 | 1.24 | 5.87 | 94.13 |
| | | Bottom | 48.69 | 0.00 | 0.00 | 0.00 | 48.69 | 51.31 |
| TSSBS | 288 | Upper | 2.43 | 3.13 | 5.90 | 0.69 | 12.15 | 87.85 |
| | | Bottom | 46.53 | 0.69 | 0.35 | 0.00 | 47.57 | 52.43 |

Table (6) and (7) present the T2-T5 tonal contrast in the upper line and the bottom line of a couplet respectively. One common feature shared by all the collections is that the proportions of the T2-T5 tonal contrast in the bottom line are lower than those in the upper line. In the Yongming collections, the distinctions between the upper and bottom lines are around 10%. However, the distinctions expand to approximately 40% in the later dynasties. In Chapter 2, we calculated the probability of getting any two syllables of different tones in a pentasyllabic line if the syllables are randomly arranged. That is 64.3%. In the Tang collections, the proportions of T2-T5 tonal contrast in the bottom line are round 50%, which is lower than 64.3%. This indicates that the Tang poets didn't show such a tendency for having syllables with different tones at T2 and T5 in the bottom lines.

Wang (1958: 72) proposed two canonical *ping-ze* patterns for the Recent-style pentasyllabic poems. According to his proposal, there are four types of *ping-ze* patterns for a pentasyllabic couplet:

Type 1 // - - /, - - // -

Type 2 - - - //, /// - -

Type 3 /// - -, - - // -

Type 4 - - // -, /// - -

Among the four types, two of them, Type 1 and Type 3, require the syllable tones at T2 and T5 in the bottom line to be identical, which explains why nearly 50% of the bottom lines don't have tonal contrast at T2 and T5 in the data pool. As for the upper line, only Type 4, which occupies a small proportion in the data pool, requires the syllable tones at T2 and T5 to be identical. Song and Zhang (2015: 192) found out that in the Yongming style verse, the second and the fifth tones within a line must be different if the fifth tone is *shang*, *qu*, or *ru*. This rule was inherited by the latter poets and preserved in the upper line of a couplet in the Recent-style verse.

4.2.3 Tonal contrasts in T2-T3

(8) The frequencies of the tonal contrasts in T2-T3 in the upper line of a couplet

| | Total couplets | | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T2=T3 | T2≠T3 |
|----------|----------------|--------|------------------|--------------------|--------------|--------------|-------|-------|
| Shen Yue | 564 | Upper | 135 | 7 | 17 | 7 | 166 | 398 |
| | | Bottom | 85 | 5 | 13 | 8 | 111 | 453 |

| | | | | | | | | |
|--------------|-----|--------|-----|----|----|---|-----|-----|
| Xie Tiao | 715 | Upper | 122 | 10 | 8 | 1 | 141 | 574 |
| | | Bottom | 130 | 4 | 13 | 4 | 151 | 564 |
| Wang Rong | 179 | Upper | 52 | 3 | 2 | 3 | 60 | 119 |
| | | Bottom | 33 | 4 | 2 | 1 | 40 | 139 |
| Xue Daoheng | 107 | Upper | 41 | 0 | 0 | 0 | 41 | 66 |
| | | Bottom | 11 | 0 | 3 | 1 | 15 | 92 |
| Shangguan Yi | 49 | Upper | 17 | 0 | 0 | 0 | 17 | 32 |
| | | Bottom | 10 | 1 | 2 | 1 | 14 | 35 |
| Du Shenyan | 212 | Upper | 85 | 0 | 1 | 0 | 86 | 126 |
| | | Bottom | 6 | 1 | 3 | 0 | 10 | 202 |
| Shen Quanqi | 597 | Upper | 219 | 0 | 5 | 0 | 224 | 373 |
| | | Bottom | 36 | 9 | 9 | 4 | 58 | 539 |
| Song Zhiwen | 647 | Upper | 216 | 3 | 3 | 3 | 225 | 422 |
| | | Bottom | 63 | 9 | 7 | 3 | 82 | 565 |
| TSSBS | 288 | Upper | 88 | 2 | 4 | 2 | 96 | 192 |
| | | Bottom | 37 | 6 | 7 | 3 | 53 | 235 |

(9) The percentages of the tonal contrasts in T2-T3

| | Total couplets | | <i>ping-</i> <i>ping</i> | <i>shang-</i> <i>shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T2=T3 | T2≠T3 |
|-------------|-------------------|--------|-----------------------------|-------------------------------|--------------|--------------|-------|-------|
| Shen Yue | 564 | Upper | 23.94 | 1.24 | 3.01 | 1.24 | 29.43 | 70.57 |
| | | Bottom | 15.07 | 0.89 | 2.30 | 1.42 | 19.68 | 80.32 |
| Xie Tiao | 715 | Upper | 17.06 | 1.40 | 1.12 | 0.14 | 19.72 | 80.28 |
| | | Bottom | 18.18 | 0.56 | 1.82 | 0.56 | 21.12 | 78.88 |
| Wang Rong | 179 | Upper | 29.05 | 1.68 | 1.12 | 1.68 | 33.52 | 66.48 |
| | | Bottom | 18.44 | 2.23 | 1.12 | 0.56 | 22.35 | 77.65 |
| Xue | 107 | Upper | 38.32 | 0.00 | 0.00 | 0.00 | 38.32 | 61.68 |
| Daoheng | | Bottom | 10.28 | 0.00 | 2.80 | 0.93 | 14.02 | 85.98 |
| Shangguan | 49 | Upper | 34.69 | 0.00 | 0.00 | 0.00 | 34.69 | 65.31 |
| Yi | | Bottom | 20.41 | 2.04 | 4.08 | 2.04 | 28.57 | 71.43 |
| Du Shenyang | 212 | Upper | 40.09 | 0.00 | 0.47 | 0.00 | 40.57 | 59.43 |
| | | Bottom | 2.83 | 0.47 | 1.42 | 0.00 | 4.72 | 95.28 |
| Shen Quanqi | 597 | Upper | 36.68 | 0.00 | 0.84 | 0.00 | 37.52 | 62.48 |
| | | Bottom | 6.03 | 1.51 | 1.51 | 0.67 | 9.72 | 90.28 |
| Song Zhiwen | 647 | Upper | 33.38 | 0.46 | 0.46 | 0.46 | 34.78 | 65.22 |
| | | Bottom | 9.74 | 1.39 | 1.08 | 0.46 | 12.67 | 87.33 |

| | | | | | | | | |
|-------|-----|--------|-------|------|------|------|-------|-------|
| TSSBS | 288 | Upper | 30.56 | 0.69 | 1.39 | 0.69 | 33.33 | 66.67 |
| | | Bottom | 12.85 | 2.08 | 2.43 | 1.04 | 18.40 | 81.60 |

The above tables present the tonal contrasts at T2 and T3. In the Yongming collections, the proportions of T2-T3 tonal contrast in both upper line and bottom line are higher than the random rate, 64.3%. In the Sui and Tang collections, the proportions of the T2-T3 contrast in the upper line are close to the random rate, while in the bottom line, the proportions are much higher than the random rate. According to the “1-3-5 rule”, the tonal category of the first and third syllables in a pentasyllabic line are free. They can be either *ping* or *ze*. However, as can be seen from the above tables, the third syllable in the bottom line does not enjoy as much freedom as that in the upper line – most of them need to have a different tone from the second syllable.

4.2.4 Tonal contrasts in T3-T4

(10) The frequencies of the tonal contrasts in T3-T4

| | Total couplets | | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T3=T4 | T3≠T4 |
|----------|----------------|--------|------------------|--------------------|--------------|--------------|-------|-------|
| Shen Yue | 564 | Upper | 109 | 8 | 11 | 4 | 132 | 432 |
| | | Bottom | 74 | 2 | 5 | 4 | 85 | 479 |

| | | | | | | | | |
|-------------|-----|--------|-----|----|----|---|-----|-----|
| Xie Tiao | 715 | Upper | 148 | 15 | 10 | 4 | 177 | 538 |
| | | Bottom | 143 | 8 | 5 | 3 | 159 | 556 |
| Wang Rong | 179 | Upper | 27 | 1 | 1 | 0 | 29 | 150 |
| | | Bottom | 29 | 1 | 0 | 0 | 30 | 149 |
| Xue Daoheng | 107 | Upper | 26 | 0 | 2 | 3 | 31 | 76 |
| | | Bottom | 15 | 1 | 1 | 0 | 17 | 90 |
| Shangguan | 49 | Upper | 24 | 0 | 0 | 0 | 24 | 25 |
| Yi | | Bottom | 1 | 1 | 2 | 0 | 4 | 45 |
| Du Shenyang | 212 | Upper | 96 | 2 | 1 | 0 | 99 | 113 |
| | | Bottom | 1 | 2 | 8 | 1 | 12 | 200 |
| Shen Quanqi | 597 | Upper | 264 | 0 | 2 | 2 | 268 | 329 |
| | | Bottom | 14 | 10 | 10 | 6 | 40 | 557 |
| Song Zhiwen | 647 | Upper | 250 | 3 | 2 | 1 | 256 | 391 |
| | | Bottom | 20 | 6 | 15 | 8 | 49 | 598 |
| TSSBS | 288 | Upper | 94 | 0 | 0 | 3 | 97 | 191 |
| | | Bottom | 16 | 7 | 5 | 3 | 31 | 257 |

(11) The percentages of the tonal contrasts in T3-T4

| | Total couplets | | <i>ping-</i> <i>ping</i> | <i>shang-</i> <i>shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T3=T4 | T3≠T4 |
|-----------------|-------------------|--------|-----------------------------|-------------------------------|--------------|--------------|-------|-------|
| Shen Yue | 564 | Upper | 19.33 | 1.42 | 1.95 | 0.71 | 23.40 | 76.60 |
| | | Bottom | 13.12 | 0.35 | 0.89 | 0.71 | 15.07 | 84.93 |
| Xie Tiao | 715 | Upper | 20.70 | 2.10 | 1.40 | 0.56 | 24.76 | 75.24 |
| | | Bottom | 20.00 | 1.12 | 0.70 | 0.42 | 22.24 | 77.76 |
| Wang Rong | 179 | Upper | 15.08 | 0.56 | 0.56 | 0.00 | 16.20 | 83.80 |
| | | Bottom | 16.20 | 0.56 | 0.00 | 0.00 | 16.76 | 83.24 |
| Xue Daoheng | 107 | Upper | 24.30 | 0.00 | 1.87 | 2.80 | 28.97 | 71.03 |
| | | Bottom | 14.02 | 0.93 | 0.93 | 0.00 | 15.89 | 84.11 |
| Shangguan Yi | 49 | Upper | 48.98 | 0.00 | 0.00 | 0.00 | 48.98 | 51.02 |
| | | Bottom | 2.04 | 2.04 | 4.08 | 0.00 | 8.16 | 91.84 |
| Du Shenyang | 212 | Upper | 45.28 | 0.94 | 0.47 | 0.00 | 46.70 | 53.30 |
| | | Bottom | 0.47 | 0.94 | 3.77 | 0.47 | 5.66 | 94.34 |
| Shen Quanqi | 597 | Upper | 44.22 | 0.00 | 0.34 | 0.34 | 44.89 | 55.11 |
| | | Bottom | 2.35 | 1.68 | 1.68 | 1.01 | 6.70 | 93.30 |
| Song Zhiwen | 647 | Upper | 38.64 | 0.46 | 0.31 | 0.15 | 39.57 | 60.43 |
| | | Bottom | 3.09 | 0.93 | 2.32 | 1.24 | 7.57 | 92.43 |

| | | | | | | | | |
|-------|-----|--------|-------|------|------|------|-------|-------|
| TSSBS | 288 | Upper | 32.64 | 0.00 | 0.00 | 1.04 | 33.68 | 66.32 |
| | | Bottom | 5.56 | 2.43 | 1.74 | 1.04 | 10.76 | 89.24 |

Table (10) and (11) show the tonal contrast at T3 and T4. Similar to the T2-T3 contrast, the rates of T3-T4 tonal contrast in the Yongming collections are higher than the random rate and the distinctions between the upper line and the bottom line are small. In the Tang collections, the rate of T3-T4 contrast in the upper line is lower than the random rate, except for *Tangshi sanbai shou*, which is slightly higher than the random rate. However, in the bottom line, the rates increase to around 90%. Therefore, in the Recent-style poems, the third and fourth syllables in the bottom line tend to have different tones.

4.3 Pair-wise Contrasts within a Couplet

Among the nine defects mentioned in the first section, six of them are concerned with the pair-wise contrasts within a couplet. In *Bunkyō hifuron*, these defects are described as follows.

(12) The descriptions of *pingtou*, *shangwei*, *shuihun*, *huomie*, *muku*, and *jinque* in *Bunkyō hifuron*

平頭詩者，五言詩第一字不得與第六字同聲，第二字不得與第七字同聲。同聲

者，不得同平上去入四聲，犯者名為犯平頭。

Poem with *pingtou* means that the first and the sixth characters [of a couplet] in a pentasyllabic poem should not have the same tone and the second and the seventh characters [of a couplet] should not have the same tone. Having the same tone means both having one of the four *ping*, *shang*, *qu*, or *ru* tones. A poem that violates this rule is said to have committed the *pingtou* defect. (Song and Zhang, 2015: 22)

或曰：此平頭如是，近代成例，然未精也。欲知之者，上句第一字與下句第一字，同平聲不為病；同上去入聲一字即病。若上句第二字與下句第二字同聲，無問平上去入，皆是巨病。此而或犯，未曰知音。

Someone said, this *pingtou* defect is like this. In recent times, it became the common practice, but not yet good at it. [If one wants to know about it], [then it means if] the first character in the first line of a couplet and the first character of the second line both have the same *ping* tone, then it is not a defect. [If] they both have a *shang*, *qu* or *ru* tone, then even having one such character is a defect. If the second character of the first line and the second character of the second line have the same tone, then regardless of the tone, these cases are all huge defects. Then if someone violates this, [he] is yet to be called knowing the sound. (Song and Zhang, 2015: 22)

上尾詩者，五言詩中，第五字不得與第十字同聲，名為上尾。

Poems with *shangwei* means that in a pentasyllabic poem, the fifth character must not have the same tone with the tenth character. [The poem that violates this rule is] called *shangwei*.

水渾病，謂第一與第六之犯也。

Shuihun defect refers to the violation of the first and the sixth [characters]²¹.

火滅病，謂第二與第七之犯也。

Huomie defect refers to the violation of the second and the seventh [characters]²².

木枯病，謂第三與第八之犯也。

Muku defect refers to the violation of the third and the eighth [characters]²³.

金缺病，謂第四與第九之犯也。

Jinque defect refers to the violation of the fourth and the ninth [characters]²⁴.

²¹ If the first character and the sixth character of a couplet have the same tone, then the poem commits *shuihun* defect.

²² If the second character and the seventh character of a couplet have the same tone, then the poem commits *huomie* defect.

²³ If the third character and the eighth character of a couplet have the same tone, then the poem commits *muku* defect.

²⁴ If the fourth character and the ninth character of a couplet have the same tone, then the poem commits *jinque* defect.

Pingtou, *shuihun*, and *huomie* are all concerned with the tonal contrasts of the first two syllables in the upper and bottom lines of a couplet. The definitions of these defects overlap with each other – The *pingtou* defect is the combination of *shuihun* (T1-T6) and *huomie* (T2-T7). *Shangwei*, *muku*, and *jinqe* are respectively concerned with the tonal contrasts at T5-T10, T3-T8, and T4-T9. In the following sections I will examine the tonal contrasts in these positions diachronically.

4.3.1 Tonal contrast in T1-T6

(13) The frequencies of the tonal contrasts in T1-T6

| | Total couplets | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T1=T6 | T1≠T6 |
|--------------|----------------|------------------|--------------------|--------------|--------------|-------|-------|
| Shen Yue | 564 | 170 | 7 | 10 | 13 | 200 | 364 |
| Xie Tiao | 715 | 271 | 4 | 16 | 15 | 306 | 409 |
| Wang Rong | 179 | 58 | 4 | 6 | 2 | 70 | 109 |
| Xue Daoheng | 107 | 29 | 1 | 1 | 1 | 32 | 75 |
| Shangguan Yi | 49 | 12 | 1 | 3 | 1 | 17 | 32 |
| Du Shenyan | 212 | 46 | 0 | 2 | 4 | 52 | 160 |
| Shen Quanqi | 597 | 204 | 4 | 7 | 2 | 217 | 380 |
| Song Zhiwen | 647 | 196 | 0 | 14 | 4 | 214 | 433 |

| | | | | | | | |
|-------|-----|----|---|---|---|----|-----|
| TSSBS | 288 | 87 | 2 | 3 | 3 | 95 | 193 |
|-------|-----|----|---|---|---|----|-----|

(14) The percentages of the tonal contrasts in T1-T6

| | <i>ping-ping</i> | <i>shang- shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T1=T6 | T1≠T6 |
|--------------|------------------|-------------------------|--------------|--------------|-------|-------|
| Shen Yue | 30.14 | 1.24 | 1.77 | 2.30 | 35.46 | 64.54 |
| Xie Tiao | 37.90 | 0.56 | 2.24 | 2.10 | 42.80 | 57.20 |
| Wang Rong | 32.40 | 2.23 | 3.35 | 1.12 | 39.11 | 60.89 |
| Xue Daoheng | 27.10 | 0.93 | 0.93 | 0.93 | 29.91 | 70.09 |
| Shangguan Yi | 24.49 | 2.04 | 6.12 | 2.04 | 34.69 | 65.31 |
| Du Shenyang | 21.70 | 0.00 | 0.94 | 1.89 | 24.53 | 75.47 |
| Shen Quanqi | 34.17 | 0.67 | 1.17 | 0.34 | 36.35 | 63.65 |
| Song Zhiwen | 30.29 | 0.00 | 2.16 | 0.62 | 33.08 | 66.92 |
| TSSBS | 30.21 | 0.69 | 1.04 | 1.04 | 32.99 | 67.01 |

Table (13) and (14) present the rates of the tonal contrast in T1-T6, which is approximately in the range of 60% to 70% in all collections. In many collections, the rates are very close to the random rate, 64.3%. Comparatively speaking, the first syllable in each line, which is at the farthest position from the rhyming position, is much freer than the others in tonal selection.

4.3.2 Tonal contrast in T2-T7

(15) The frequencies of the tonal contrasts in T2-T7

| | Total couplets | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T2=T7 | T2≠T7 |
|--------------|----------------|------------------|--------------------|--------------|--------------|-------|-------|
| Shen Yue | 564 | 123 | 13 | 17 | 5 | 158 | 406 |
| Xie Tiao | 715 | 163 | 23 | 18 | 4 | 208 | 507 |
| Wang Rong | 179 | 32 | 2 | 5 | 6 | 45 | 134 |
| Xue Daoheng | 107 | 13 | 1 | 4 | 1 | 19 | 88 |
| Shangguan Yi | 49 | 4 | 0 | 0 | 1 | 5 | 44 |
| Du Shenyang | 212 | 1 | 0 | 1 | 0 | 2 | 210 |
| Shen Quanqi | 597 | 6 | 0 | 3 | 0 | 9 | 588 |
| Song Zhiwen | 647 | 15 | 1 | 3 | 1 | 20 | 627 |
| TSSBS | 288 | 4 | 0 | 1 | 0 | 5 | 283 |

(16) The percentages of the tonal contrasts in T2-T7

| | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T2=T7 | T2≠T7 |
|----------|------------------|--------------------|--------------|--------------|-------|-------|
| Shen Yue | 21.81 | 2.30 | 3.01 | 0.89 | 28.01 | 71.99 |
| Xie Tiao | 22.80 | 3.22 | 2.52 | 0.56 | 29.09 | 70.91 |

| | | | | | | |
|--------------|-------|------|------|------|-------|-------|
| Wang Rong | 17.88 | 1.12 | 2.79 | 3.35 | 25.14 | 74.86 |
| Xue Daoheng | 12.15 | 0.93 | 3.74 | 0.93 | 17.76 | 82.24 |
| Shangguan Yi | 8.16 | 0.00 | 0.00 | 2.04 | 10.2 | 89.80 |
| Du Shenyang | 0.47 | 0.00 | 0.47 | 0.00 | 0.94 | 99.06 |
| Shen Quanqi | 1.01 | 0.00 | 0.50 | 0.00 | 1.51 | 98.49 |
| Song Zhiwen | 2.32 | 0.15 | 0.46 | 0.15 | 3.09 | 96.91 |
| TSSBS | 1.39 | 0.00 | 0.35 | 0.00 | 1.74 | 98.26 |

Table (15) and (16) present the rates of tonal contrast at T2-T7. The tendency is obvious that the rates of T2-T7 tonal contrast increase diachronically. In the Tang collections, the rates are very high, nearly 100%, and similar among different poets. To verify whether there is a significant difference among the T2-T7 contrast rates in the Tang collections, we can conduct the chi-square test and the results are shown as follows.

(17) Chi-square test on the T2-T7 tonal contrast in the Tang collections²⁵

| | Observed frequency | | Expected frequency | |
|-------------|--------------------|-------|--------------------|-------|
| | T2=T7 | T2≠T7 | T2=T7 | T2≠T7 |
| Du Shenyang | 2 | 210 | 4 | 208 |

²⁵ Shangguan Yi's collection is excluded from this test because the sample size is much smaller than the others and the T2-T7 tonal contrast rate is very different from the others.

| | | | | |
|-------------|---|-----|----|-----|
| Shen Quanqi | 9 | 588 | 12 | 585 |
| Song Zhiwen | 20 | 627 | 13 | 634 |
| TSSBS | 5 | 283 | 6 | 282 |
| χ^2 | 4.402 < 7.81 ($p=0.05$, $df=3$), no significant difference | | | |

In summary, in the Tang collections, the proportions of the T2-T7 contrast are larger than 95% and there is no significant difference among different poets' collections. That indicates that T2-T7 tonal contrast is a strict rule that was obeyed by the poets at that time.

4.3.3 Tonal contrast in T3-T8

(18) The frequencies of the tonal contrasts in T3-T8

| | Total couplets | <i>ping-</i> <i>ping</i> | <i>shang-</i> <i>shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T3=T8 | T3≠T8 |
|--------------|-------------------|-----------------------------|-------------------------------|--------------|--------------|-------|-------|
| Shen Yue | 564 | 92 | 29 | 22 | 8 | 151 | 413 |
| Xie Tiao | 715 | 142 | 27 | 46 | 13 | 228 | 487 |
| Wang Rong | 179 | 31 | 3 | 6 | 4 | 44 | 135 |
| Xue Daoheng | 107 | 17 | 0 | 6 | 2 | 25 | 82 |
| Shangguan Yi | 49 | 9 | 0 | 2 | 0 | 11 | 38 |
| Du Shenyan | 212 | 5 | 0 | 3 | 1 | 9 | 203 |

| | | | | | | | |
|-------------|-----|----|----|----|----|----|-----|
| Shen Quanqi | 597 | 35 | 13 | 20 | 10 | 78 | 519 |
| Song Zhiwen | 647 | 42 | 8 | 19 | 14 | 83 | 564 |
| TSSBS | 288 | 23 | 3 | 10 | 6 | 42 | 246 |

(19) The percentages of the tonal contrasts in T3-T8

| | <i>ping-ping</i> | <i>shang- shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T3=T8 | T3≠T8 |
|--------------|------------------|-------------------------|--------------|--------------|-------|-------|
| Shen Yue | 16.31 | 5.14 | 3.90 | 1.42 | 26.77 | 73.23 |
| Xie Tiao | 19.86 | 3.78 | 6.43 | 1.82 | 31.89 | 68.11 |
| Wang Rong | 17.32 | 1.68 | 3.35 | 2.23 | 24.58 | 75.42 |
| Xue Daoheng | 15.89 | 0.00 | 5.61 | 1.87 | 23.36 | 76.64 |
| Shangguan Yi | 18.37 | 0.00 | 4.08 | 0.00 | 22.45 | 77.55 |
| Du Shenyan | 2.36 | 0.00 | 1.42 | 0.47 | 4.25 | 95.75 |
| Shen Quanqi | 5.86 | 2.18 | 3.35 | 1.68 | 13.07 | 86.93 |
| Song Zhiwen | 6.49 | 1.24 | 2.94 | 2.16 | 12.83 | 87.17 |
| TSSBS | 7.99 | 1.04 | 3.47 | 2.08 | 14.58 | 85.42 |

As shown in (18) and (19), the proportions of the T3-T8 tonal contrast in all collections are higher than the random rate, 64.3%, which means the poets prefer to have different tones at T3 and T8. However, the rates of the T3-T8 tonal contrast are not as high

as those of T2-T7, which may indicate that the T3-T8 tonal contrast is not as strict as the T2-T4 contrast. It is noteworthy that the Tang poets showed a higher preference than the Yongming poets in terms of the tonal contrast at T3 and T8. It is also noticeable that in Shen Quanqi's, Song Zhiwen's, and *Tangshi sanbaishou* collections, the combinations of *shang-shang*, *qu-qu*, and *ru-ru* take about half of the proportions where T3 and T8 have the same tone. This is different from what is observed from the previous tables where the combinations of *ping-ping* are the majority.

4.3.4 Tonal contrast in T4-T9

(20) The frequencies of the tonal contrasts in T4-T9

| | Total couplets | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T4=T9 | T4≠T9 |
|--------------|----------------|------------------|--------------------|--------------|--------------|-------|-------|
| Shen Yue | 564 | 207 | 10 | 20 | 3 | 240 | 324 |
| Xie Tiao | 715 | 262 | 28 | 15 | 6 | 311 | 404 |
| Wang Rong | 179 | 65 | 6 | 3 | 1 | 75 | 104 |
| Xue Daoheng | 107 | 27 | 1 | 1 | 0 | 29 | 78 |
| Shangguan Yi | 49 | 12 | 1 | 1 | 0 | 14 | 35 |
| Du Shenyan | 212 | 9 | 0 | 0 | 0 | 9 | 203 |
| Shen Quanqi | 597 | 47 | 0 | 0 | 1 | 48 | 549 |

| | | | | | | | |
|-------------|-----|----|---|---|---|----|-----|
| Song Zhiwen | 647 | 76 | 2 | 5 | 1 | 84 | 563 |
| TSSBS | 288 | 46 | 1 | 3 | 0 | 50 | 238 |

(21) The percentages of the tonal contrasts in T4-T9

| | <i>ping-ping</i> | <i>shang- shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T4=T9 | T4≠T9 |
|--------------|------------------|-------------------------|--------------|--------------|-------|-------|
| Shen Yue | 36.70 | 1.77 | 3.55 | 0.53 | 42.55 | 57.45 |
| Xie Tiao | 36.64 | 3.92 | 2.10 | 0.84 | 43.50 | 56.50 |
| Wang Rong | 36.31 | 3.35 | 1.68 | 0.56 | 41.90 | 58.10 |
| Xue Daoheng | 25.23 | 0.93 | 0.93 | 0.00 | 27.10 | 72.90 |
| Shangguan Yi | 24.49 | 2.04 | 2.04 | 0.00 | 28.57 | 71.43 |
| Du Shenyang | 4.25 | 0.00 | 0.00 | 0.00 | 4.25 | 95.75 |
| Shen Quanqi | 7.87 | 0.00 | 0.00 | 0.17 | 8.04 | 91.96 |
| Song Zhiwen | 11.75 | 0.31 | 0.77 | 0.15 | 12.98 | 87.02 |
| TSSBS | 15.97 | 0.35 | 1.04 | 0.00 | 17.36 | 82.64 |

The Yongming poets and the Tang poets showed a different preference in terms of the tonal contrast at T4 and T9. In the Yongming collections, the ratios of the T4-T9 tonal contrast are lower than the random rate, 64.3%, while in the later dynasties, the rates increase dramatically. The main reason is that in the Yongming collections, the poets tended

to have two syllables with *ping* tone at T4 and T9, while in the later dynasties, the proportions of the *ping-ping* combination decreased.

4.3.5 Tonal contrast in T5-T10

(22) The frequencies of the tonal contrasts in T5-T10

| | Total couplets | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T5=T10 | T5≠T10 |
|--------------|----------------|------------------|--------------------|--------------|--------------|--------|-----------|
| Shen Yue | 564 | 18 | 4 | 5 | 4 | 31 | 533 |
| Xie Tiao | 715 | 21 | 3 | 3 | 1 | 28 | 687 |
| Wang Rong | 179 | 3 | 0 | 0 | 0 | 3 | 176 |
| Xue Daoheng | 107 | 8 | 0 | 0 | 3 | 11 | 96 |
| Shangguan Yi | 49 | 2 (0) | 0 | 0 | 0 | 2 (0) | 47 (49) |
| Du Shenyan | 212 | 4 (0) | 0 | 0 | 0 | 4 (0) | 208 (212) |
| Shen Quanqi | 597 | 24 (1) | 0 | 0 | 0 | 24 (1) | 573 (596) |
| Song Zhiwen | 647 | 34 (5) | 0 | 0 | 0 | 34 (5) | 613 (642) |
| TSSBS | 288 | 13 (1) | 1 | 0 | 1 | 15 (3) | 273 (285) |

(23) The percentages of the tonal contrasts in T5-T10

| | <i>ping-ping</i> | <i>shang- shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T5=T10 | T5≠T10 |
|--------------|------------------|-------------------------|--------------|--------------|-------------|----------------|
| Shen Yue | 3.19 | 0.71 | 0.89 | 0.71 | 5.50 | 94.50 |
| Xie Tiao | 2.94 | 0.42 | 0.42 | 0.14 | 3.92 | 96.08 |
| Wang Rong | 1.68 | 0.00 | 0.00 | 0.00 | 1.68 | 98.32 |
| Xue Daoheng | 7.48 | 0.00 | 0.00 | 2.80 | 10.28 | 89.72 |
| Shangguan Yi | 4.08 (0) | 0.00 | 0.00 | 0.00 | 4.08 (0) | 95.92 (100.00) |
| Du Shenyang | 1.89 (0) | 0.00 | 0.00 | 0.00 | 1.89 (0) | 98.11 (100.00) |
| Shen Quanqi | 4.02 (0.17) | 0.00 | 0.00 | 0.00 | 4.02 (0.17) | 95.98 (99.83) |
| Song Zhiwen | 5.26 (0.77) | 0.00 | 0.00 | 0.00 | 5.26 (0.77) | 94.74 (99.23) |
| TSSBS | 4.51 (0.35) | 0.35 | 0.00 | 0.35 | 5.21 (1.04) | 94.79 (98.96) |

Table (22) and (23) present the proportions of the T5-T10 tonal contrast. In both Yongming and Tang collections, the rates of the T5-T10 contrast are very high, which are over 90%. In Recent-style verse, the rhyming positions are at the end of every couplet. However, sometimes the fifth syllable of the first couplet could also rhyme if it is a *ping* tone, which will cause the fifth and tenth syllables to both have the *ping* tone. If we exclude such cases from the calculation, the proportions of the T5-T10 contrast in the Tang collections will approximate 100%, as shown in the parentheses. To verify whether there

is a significant difference among the T5-T10 tonal contrast rates in the Tang collections, we can conduct the chi-square test and the results are as follows.

(24) Chi-square test on the T5-T10 tonal contrast rates in the Tang collections

| | Observed frequency | | Expected frequency | |
|--------------|---|--------|--------------------|--------|
| | T5=T10 | T5≠T10 | T5=T10 | T5≠T10 |
| Shangguan Yi | 0 | 49 | 1 | 48 |
| Du Shenyan | 0 | 212 | 1 | 211 |
| Shen Quanyi | 1 | 596 | 3 | 594 |
| Song Zhiwen | 5 | 642 | 3 | 644 |
| TSSBS | 3 | 285 | 1 | 287 |
| χ^2 | 2.310 < 9.49 ($p=0.05$, $df=4$), no significant difference | | | |

We can find that, similar to the T2-T7 tonal contrast, T5-T10 contrast is also a strict rule that was obeyed by the poets in the Tang dynasty.

4.4 The Rules of *dui* and *nian*

The ultimate goal of tonal prosody in the Recent-style verse is to avoid monotonous repetition, which requires alternating *ping* tone and *ze* tone within lines, tonal contrasts

between the upper lines and the bottom lines of couplets, and different tonal patterns of adjacent couplets. To achieve the goal, the tonal categories of the first two syllables in the bottom lines should contrast with those of the first two syllables in the upper lines, which is called *dui*. The tonal categories of the first two syllables in the upper lines should be identical with those of the first two syllables in the bottom lines of the last couplets, which is called *nian*. Given that the tonal category of the first syllable in a couplet is often more flexible than the others, the rules of *dui* and *nian* only apply to the second syllable of a line. Here is an example, in which each letter represents a syllable.

(25)

A B C D E, F G H I J
 K L M N O, P Q R S T

Dui requires the tonal categories of B and G, L and Q should be different. *Nian* requires the tonal categories of G and L should be identical. If the tonal categories of B and G are the same, which does not meet the requirement of *dui*, this will be called *shidui* 失對. Similarly, failure of meeting the requirement of *nian* will be called *shinian* 失黏.

According to Wang (1958: 116-122), *dui* and *nian* had not become important rules of the Recent-style versification before High Tang period (650-755). Compared to *dui*, *nian* was even less important. The poets in the early Tang dynasty did not pay much attention to

nian that might be a tendency instead of a rule during the early stage of the Recent-style versification. In this section, I will analyze the rules of *nian* and *dui* in Shen Quanqi's and Song Zhiwen's collections to discuss how these rules were developed during this period.

(26) The frequencies of the occurrences of *dui* and *shidui* in Shen's and Song's Recent-style collections

| | <i>dui</i> | <i>shidui</i> | Overall |
|-------------|--------------|---------------|------------|
| Shen Quanqi | 580 (97.15%) | 17 (2.85%) | 597 (100%) |
| Song Zhiwen | 614 (94.90%) | 33 (5.10%) | 647 (100%) |

(27) The frequencies of the occurrences of *nian* and *shinian* in Shen's and Song's Recent-style collections

| | <i>nian</i> | <i>shinian</i> | Overall |
|-------------|--------------|----------------|------------|
| Shen Quanqi | 505 (96.19%) | 20 (3.81%) | 525 (100%) |
| Song Zhiwen | 518 (94.35%) | 31 (5.65%) | 549 (100%) |

Table (26) and Table (27) present the frequencies and the percentages of the occurrences of *dui*, *shidui*, *nian*, and *shinian* in Shen's and Song's collections. In Shen's collection, 97.15% of the couplets meet the requirement of *dui* and 96.19% of them meet the requirement of *nian*. In Song's collection, 94.90% of the couplets meet the requirement

of *dui* and 94.35% of them meet the requirement of *nian*. The data listed in the tables seem to conflict with Wang's observation. First of all, the percentages of the couplets meeting the requirement of *dui* and *nian* are so high in both Shen's and Song's collections, which makes it difficult to believe that Shen and Song did not care much about *dui* and *nian* in their versification. Secondly, the percentages of the couplets meeting the requirement of *nian* are very close to the percentages of the couplets meeting the requirement of *dui*, which cannot prove Wang's argument that *nian* was a less important requirement as compared to *dui* in the early Tang dynasty.

Although the percentages of the couplets meeting the requirement of *nian* in Shen's and Song's collections are very close to the percentages of the couplets meeting the requirement of *dui*, the gap still exists. The question is whether the gap is small enough to conclude that the poets followed the requirement of *nian* as strictly as they followed the requirement of *dui*. To answer this question, we will need to apply chi-square test.

(28) The frequencies of the occurrences of *dui*, *shidui*, *nian*, and *shinian* in Shen's Recent-style collection

| | Success (<i>dui/nian</i>) | Failure (<i>shidui/shinian</i>) | Row total |
|----------------------------|-----------------------------|-----------------------------------|------------|
| Requirement of <i>dui</i> | 580 (97.15%) | 17 (2.85%) | 597 (100%) |
| Requirement of <i>nian</i> | 505 (96.19%) | 20 (3.81%) | 525 (100%) |

| | | | |
|---------|---------------|------------|-------------|
| Overall | 1085 (96.70%) | 37 (3.30%) | 1122 (100%) |
|---------|---------------|------------|-------------|

Table (28) shows the frequencies and proportions of the occurrences of *dui*, *shidui*, *nian* and *shinian* in Shen's collection. The numbers under the "success" row represent how many couplets meet the requirements of *dui* or *nian*, and the numbers under the "failure" row show the numbers of the occurrences of *shidui* or *shinian*. The proportions in the overall column will be used as expected proportions and then we can get the expected frequencies as shown in Table (29).

(29) The expected frequencies of the occurrences of *dui*, *shidui*, *nian*, and *shinian* in Shen's

Recent-style collection

| | Success (<i>dui/nian</i>) | Failure (<i>shidui/shinian</i>) |
|----------------------------|-----------------------------|-----------------------------------|
| Requirement of <i>dui</i> | 577 | 20 |
| Requirement of <i>nian</i> | 508 | 17 |

Based on the expected values listed in Table (29), then we can calculate the chi-square values, as shown below.

$$\chi^2 (\text{Shen}) = \sum \frac{(f_o - f_e)^2}{f_e} = \frac{(580 - 577)^2}{577} + \frac{(17 - 20)^2}{20} + \frac{(505 - 508)^2}{508} + \frac{(20 - 17)^2}{17} = 1.02 <$$

3.84

The chi-square value is smaller than the critical value of $\chi^2_{0.05}(1)$, 3.84, which means that there is no significant difference between the strictness of applying *dui* and *nian* in Shen's collection.

Following the similar process, we can get the chi-square value of Song's collection.

(30) The frequencies of the occurrences of *dui*, *shidui*, *nian* and *shinian* in Song's Recent-style collection

| | Success (<i>dui/nian</i>) | Failure (<i>shidui/shinian</i>) | Row total |
|----------------------------|-----------------------------|-----------------------------------|-------------|
| Requirement of <i>dui</i> | 614 (94.90%) | 33 (5.10%) | 647 (100%) |
| Requirement of <i>nian</i> | 518 (94.35%) | 31 (5.65%) | 549 (100%) |
| Overall | 1132 (94.65%) | 64 (5.35%) | 1196 (100%) |

(31) The expected frequencies of the occurrences of *dui*, *shidui*, *nian* and *shinian* in Song's Recent-style collection

| | Success (<i>dui/nian</i>) | Failure (<i>shidui/shinian</i>) |
|----------------------------|-----------------------------|-----------------------------------|
| Requirement of <i>dui</i> | 612 | 35 |
| Requirement of <i>nian</i> | 520 | 29 |

$$\chi^2(\text{Song}) = \sum \frac{(f_o - f_e)^2}{f_e} = \frac{(614 - 612)^2}{612} + \frac{(33 - 35)^2}{35} + \frac{(518 - 520)^2}{520} + \frac{(31 - 29)^2}{29} = 0.27 <$$

3.84

In the above tests, both chi-square values are smaller than 3.84, which means that Shen Quanqi and Song Zhiwen followed the requirement of *nian* as strictly as they followed the requirement of *dui*. According to the results, it is impossible to conclude that *nian* and *dui* had not become important rules in the early Tang dynasty and that *nian* was even less important as compared to *dui*. On the contrary, the results show that *dui* and *nian* had already become important rules in Shen-Song style. But it is worth noting that Wang also noticed *shinian* more frequently occurred in heptasyllabic poems than in pentasyllabic poems (Wang, 1958:122). Hence, further research needs to be done on *dui* and *nian* in heptasyllabic poems.

4.5 Summary

In this chapter I mainly discuss the tonal contrast pairs mentioned in *Bunkyō hifuron*, analyze whether these rules were adopted by poets in different periods, and study the rules of *nian* and *dui* in the early Tang period. When analyzing the data, I set this criterion: if the rates of a certain tonal contrast exceed 95% and are identical in the collections of the same period, then this tonal contrast will be considered as a strict rule of that period. For the tonal contrast rates that are significantly higher than the random rate but don't meet the first criterion, we will consider that there are tendencies for the syllables at these positions to have different tones. I also categorize the lines into two groups, the upper lines and the

bottom lines of couplets, and find that some pair-wise tonal contrast rules are different between the upper lines and the bottom lines. I use the chi-square test to verify whether the proportions are identical. The findings in this chapter are summarized below.

In the early Tang dynasty, there are three strict tonal contrast rules: T2-T4 tonal contrast in the bottom line of a couplet, T2-T7 tonal contrast, and T5-T10 tonal contrast. In the Tang collections, there are tendencies for the syllables in the following positions to have different tones: T2-T4 in the upper line, T2-T3 in the bottom line, T3-T4 in the bottom line, T3-T8, and T4-T9. As for the rule of *nian* and *dui*, the study shows that Shen Quanqi and Song Zhiwen strictly followed the requirements of *dui* and *nian* in the pentasyllabic Recent-style poems. There is no difference in the strictness of applying *dui* and *nian*, which is opposite to Wang's observation (1958: 116-122).

Chapter 5. Lines Violating T2-T4 Tonal Contrast Rules

5.1 Introduction

In the previous chapter, we conclude that T2-T4 tonal contrast in the bottom lines is one of the strict rules in the early Tang period, while this contrast in the upper lines is not as strict as that in the bottom lines. What causes this difference is that approximately 10% of upper lines in each Tang collection have an identical tone at T2 and T4.

(1) The frequencies and the proportions of the T2-T4 tonal contrast in Shen's, Song's and TSSBS collections

| | Total couplets | | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T2=T4 | T2≠T4 |
|----------------|----------------|--------|------------------|--------------------|--------------|--------------|----------------|-----------------|
| Shen Quanqi | 597 | Upper | 43 (7.20%) | 1 (0.17%) | 2 (0.34%) | 3 (0.50%) | 49 (8.21%) | 548 (91.79%) |
| | | Bottom | 6 (1.01%) | 0 (0.00%) | 1 (0.17%) | 0 (0.00%) | 7 (1.17%) | 590 (98.83%) |
| Song Zhiwen | 647 | Upper | 73 (11.28%) | 4 (0.62%) | 4 (0.62%) | 1 (0.15%) | 82 (12.67%) | 565 (87.33%) |

| | | | | | | | | |
|-------|-----|--------|----------------|--------------|--------------|--------------|----------------|-----------------|
| | | Bottom | 9 (1.39%) | 1 (0.15%) | 4 (0.62%) | 0 (0.00%) | 14 (2.16%) | 633 (97.84%) |
| TSSBS | 288 | Upper | 38 (13.19%) | 1 (0.35%) | 4 (1.39%) | 0 (0.00%) | 43 (14.93%) | 245 (85.07%) |
| | | Bottom | 10 (3.47%) | 0 (0.00%) | 2 (0.69%) | 0 (0.00%) | 12 (4.17%) | 276 (95.83%) |

Generally speaking, the second and fourth syllables in the pentasyllabic lines are at the rhythm points and thus their tonal categories are fixed—they should be different with each other. In the previous chapter, we conclude three strict tonal prosody rules of the Recent style, and two of them are concerned with the syllables at the rhythm points. And according to the “1-3-5 rule”, the second and fourth syllables do not enjoy as much as freedom with the first and third syllables in terms of the selection of the tonal category. However, from the statistics, there are indeed a group of lines that did not follow the above rules. Wang (1958: 100) referred these lines as the special forms of the tonal arrangement. He grouped these lines into two types: (A) PPZPZ and (B) ZZPZZ. According to him, the tonal category of the first syllable in Type A should be *ping* tone and Type A often appears in the upper line of the last couplet in a poem (Wang, 1958: 100-101).

Based on the data in Shen’s, Song’s and TSSBS collections as shown in (1), it is obvious that Type A, that T2 and T4 both have *ping* tone in the upper lines, takes most of

the special forms. In the following sections, I will analyze the locations, tonal categories of the first syllable and tonal contrasts of Type A.

5.2 Data Analysis

5.2.1 The locations of Type A in a poem

The poem length in Shen's, Song's, and TSSBS collections are various—there are two-couplets *jueju*, four-couplets *lüshi*, and *pailü* which contains more than four couplets. When calculating the locations of Type A, we will divide a pome into three parts: the first couplet, the middle couplets, and the last couplet.

(2) The locations of Type A in a poem in Shen's, Song's, and TSSBS collections

| | Shen Quanqi | Song Zhiwen | TSSBS | Row Total |
|-----------------|-------------|-------------|-------------|-----------|
| First couplet | 4 (9.30%) | 7 (9.58%) | 13 (34.21%) | 24 |
| Middle couplets | 26 (60.47%) | 33 (45.21%) | 10 (26.32%) | 69 |
| Last couplet | 13 (30.23%) | 33 (45.21%) | 15 (39.47%) | 61 |
| Column Total | 43 | 73 | 38 | 154 |

Table (2) presents the locations of Type A in a poem in two early Tang collections and one high Tang collection. In Shen's and Song's collections, Type A rarely appears in the

first couplet. In addition to this, there is no obvious tendency shared by all three collections. In Shen's collection, Type A appears in the middle couplets twice as frequently as Type A appears in the last couplet; while in Song's collection, the two frequencies are about the same. In TSSBS collection, Type A almost appears evenly in the first, middle, and last couplets.

5.2.2 The tones of the first syllable in Type A

Wang (1958: 100) proposed that Type A is transformed from one of the four basic tonal patterns—PPPZZ by switching the tonal category of the third and fourth syllables. Therefore, the tonal pattern of Type A is PPZPZ. He further concluded it is a principle that the tonal category of the first syllable in Type A should avoid *ze*.

(3) The tones of the first syllable in Type A in Shen's, Song's, and TSSBS collections

| | Shen Quanqi | Song Zhiwen | TSSBS | Row Total |
|--------------|-------------|-------------|-------------|-----------|
| <i>ping</i> | 29 (67.44%) | 58 (79.45%) | 30 (78.95%) | 117 |
| <i>shang</i> | 2 (4.65%) | 7 (9.59%) | 5 (13.16%) | 14 |
| <i>qu</i> | 5 (11.63%) | 4 (5.48%) | 1 (2.63%) | 10 |
| <i>ru</i> | 7 (16.28%) | 4 (5.48%) | 2 (5.26%) | 13 |
| Column Total | 43 | 73 | 38 | 154 |

(4) The overall tonal distributions in T1 in Shen's, Song's, and TSSBS collections

| | Shen Quanqi | Song Zhiwen | TSSBS | Row Total |
|--------------|--------------|--------------|--------------|-----------|
| <i>ping</i> | 262 (43.89%) | 283 (43.74%) | 141 (48.96%) | 686 |
| <i>shang</i> | 114 (19.10%) | 101 (15.61%) | 47 (16.32%) | 262 |
| <i>qu</i> | 118 (19.77%) | 151 (23.34%) | 46 (15.97%) | 315 |
| <i>ru</i> | 103 (17.25%) | 112 (17.31%) | 54 (18.75%) | 269 |
| Column Total | 597 | 647 | 288 | 1532 |

Tables (3) and (4) respectively present the tonal distributions at T1 in Type A and in the overall collections. The proportions of the syllables with *ping* tone in the overall distributions are around 40% to 50%, while in Type A the proportions increase by over 20%. The tendency is apparent that in Type A the most syllables at T1 are *ping* tone. But it is also noticeable that there are approximately 20% counterexamples which makes it not as strict as a rule.

5.2.3 Tonal contrasts within a line in Type A

In this section I will mainly evaluate the T2-T5, T2-T3, and T3-T4 tonal contrasts in Type A.

(5) Tonal contrast in T2-T5

| | Total couplets | | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T2 = T5 | T2 ≠ T5 |
|----------------|----------------|--------|------------------|--------------------|--------------|--------------|---------------|----------------|
| Shen Quanqi | 43 | Upper | 1 | 0 | 0 | 0 | 1 (2.33%) | 42 (97.67%) |
| | | Bottom | 3 | 0 | 0 | 0 | 3 (6.98%) | 40 (93.02%) |
| Song Zhiwen | 73 | Upper | 2 | 0 | 0 | 0 | 2 (2.74%) | 71 (97.26%) |
| | | Bottom | 8 | 0 | 0 | 0 | 8 (10.96%) | 65 (89.04%) |
| TSSBS | 38 | Upper | 1 | 0 | 0 | 0 | 1 (2.63%) | 37 (97.37%) |
| | | Bottom | 2 | 1 | 0 | 0 | 3 (7.89%) | 35 (92.11%) |

(6) Tonal contrast in T2-T3

| | Total couplets | | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T2 = T3 | T2 ≠ T3 |
|----------------|----------------|--------|------------------|--------------------|--------------|--------------|---------------|----------------|
| Shen Quanqi | 43 | Upper | 3 | 0 | 0 | 0 | 3 (6.89%) | 40 (93.02%) |
| | | Bottom | 1 | 0 | 0 | 0 | 1 (2.33%) | 42 (97.67%) |
| Song Zhiwen | 73 | Upper | 6 | 0 | 0 | 0 | 6 (8.22%) | 67 (91.78%) |
| | | Bottom | 3 | 1 | 0 | 0 | 4 (5.48%) | 69 (94.52%) |
| TSSBS | 38 | Upper | 1 | 0 | 0 | 0 | 1 (2.63%) | 37 (97.37%) |
| | | Bottom | 2 | 1 | 3 | 1 | 7 (18.42%) | 31 (81.58%) |

(7) Tonal contrast in T3-T4

| | Total couplets | | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T3 = T4 | T3 ≠ T4 |
|----------------|----------------|--------|------------------|--------------------|--------------|--------------|---------------|----------------|
| Shen Quanqi | 43 | Upper | 3 | 0 | 0 | 0 | 3 (6.89%) | 40 (93.02%) |
| | | Bottom | 3 | 0 | 0 | 0 | 3 (6.89%) | 40 (93.02%) |
| Song Zhiwen | 73 | Upper | 6 | 0 | 0 | 0 | 6 (8.22%) | 67 (91.78%) |
| | | Bottom | 4 | 0 | 1 | 0 | 5 (6.85%) | 68 (93.15%) |
| TSSBS | 38 | Upper | 1 | 0 | 0 | 0 | 1 (2.63%) | 37 (97.37%) |
| | | Bottom | 6 | 0 | 0 | 0 | 6 (15.79%) | 32 (84.21%) |

Tables (5), (6), and (7) respectively illustrate three pairs of tonal contrasts in the upper and bottom lines of Type A couplets. The proportions of a certain pair of tonal contrast in three different collections present lots of similarities—most of them are over 90%. In the upper lines, the rates of T2-T5 contrast in the three collections are almost identical, which

are around 97%. In addition to T2-T5 in the upper lines, the other pair-wise tonal contrasts also take large proportions of the lines similarly. By applying chi-square tests, we can confirm whether there are significant differences in a certain pair of tonal contrast among three different collections.

(8) Chi-square tests on T2-T5, T2-T3, and T3-T4 tonal contrasts in the three Tang collections

| | χ^2 | Compared to 5.99 ($p=0.05$, $df=2$) |
|---------------------------|----------|--|
| T2-T5 in the upper lines | 0.467 | < (no significant difference) |
| T2-T5 in the bottom lines | 0.171 | < (no significant difference) |
| T2-T3 in the upper lines | 0.569 | < (no significant difference) |
| T2-T3 in the bottom lines | 5.965 | < (no significant difference) |
| T3-T4 in the upper lines | 0.569 | < (no significant difference) |
| T3-T4 in the bottom lines | 1.593 | < (no significant difference) |

According to the results in Table (8), the Tang poets have the same preference in terms of the tonal contrasts at the above positions.

5.2.4 Tonal contrasts within a couplet in Type A

In this section I will mainly evaluate the T1-T6, T2-T7, T3-T8, T4-T9, and T5-T10 tonal contrasts in Type A. The results are presented in (9), (10), (11), (12), and (13).

(9) Tonal contrast in T1-T6

| | Total couplets | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T1 = T6 | T1 ≠ T6 |
|----------------|----------------|------------------|--------------------|--------------|--------------|----------------|----------------|
| Shen Quanqi | 43 | 17 | 1 | 1 | 1 | 20 (46.51%) | 23 (53.49%) |
| Song Zhiwen | 73 | 30 | 0 | 0 | 0 | 30 (41.10%) | 43 (58.90%) |
| TSSBS | 38 | 11 | 0 | 0 | 0 | 11 (28.95%) | 27 (71.05%) |

(10) Tonal contrast in T2-T7

| | Total couplets | <i>ping-ping</i> | <i>shang-shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T2 = T7 | T2 ≠ T7 |
|----------------|----------------|------------------|--------------------|--------------|--------------|--------------|----------------|
| Shen Quanqi | 43 | 3 | 0 | 0 | 0 | 3 (6.98%) | 40 (93.02%) |

| | | | | | | | |
|----------------|----|---|---|---|---|---------------|----------------|
| Song Zhiwen | 73 | 8 | 0 | 0 | 0 | 8 (10.96%) | 65 (89.04%) |
| TSSBS | 38 | 2 | 0 | 0 | 0 | 2 (5.26%) | 36 (94.74%) |

(11) Tonal contrast in T3-T8

| | Total couplets | <i>ping- ping</i> | <i>shang- shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T3 = T8 | T3 ≠ T8 |
|----------------|-------------------|-----------------------|-------------------------|--------------|--------------|----------------|----------------|
| Shen Quanqi | 43 | 1 | 7 | 9 | 3 | 20 (46.51%) | 23 (53.49%) |
| Song Zhiwen | 73 | 2 | 3 | 5 | 7 | 17 (23.29%) | 56 (76.71%) |
| TSSBS | 38 | 0 | 3 | 6 | 1 | 10 (26.32%) | 28 (73.68%) |

(12) Tonal contrast in T4-T9

| | Total couplets | <i>ping- ping</i> | <i>shang- shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T4 = T9 | T4 ≠ T9 |
|------|-------------------|-----------------------|-------------------------|--------------|--------------|---------|---------|
| Shen | 43 | 42 | 0 | 0 | 0 | 42 | 1 |

| | | | | | | | |
|----------------|----|----|---|---|---|----------------|---------------|
| Quanqi | | | | | | (97.67%) | (2.33%) |
| Song Zhiwen | 73 | 64 | 0 | 0 | 0 | 64 (87.67%) | 9 (12.33%) |
| TSSBS | 38 | 36 | 0 | 0 | 0 | 36 (94.74%) | 2 (5.26%) |

(13) Tonal contrast in T5-T10

| | Total couplets | <i>ping- ping</i> | <i>shang- shang</i> | <i>qu-qu</i> | <i>ru-ru</i> | T5 = T10 | T5 ≠ T10 |
|----------------|-------------------|-----------------------|-------------------------|--------------|--------------|--------------|----------------|
| Shen Quanqi | 43 | 1 | 0 | 0 | 0 | 1 (2.04%) | 42 (97.96%) |
| Song Zhiwen | 73 | 2 | 0 | 0 | 0 | 2 (2.74%) | 71 (97.26%) |
| TSSBS | 38 | 1 | 0 | 0 | 1 | 2 (5.26%) | 36 (94.74%) |

According to the above tables, the three Tang collections preferred to have tonal contrasts at T2-T7 and T5-T10 while have the same tone at T4 and T9. Based on the results in Section 5.2.3 and Section 5.2.4, we can get the tonal pattern of Type A:

X P Z P Z

X Z X P P

where P stands for *ping* tone, Z stands for *ze* tone, and X stands for syllables with either *ping* tone or *ze* tone.

5.3 Summary

In this chapter we mainly examine a special group of lines where T2 and T4 have the same tone. In our data pool, most of the lines have *ping* tone at these two positions. In the early Tang collections, this type of lines seldom appears in the first couplet, but in the high Tang collections, it almost evenly appears in the first, middle, and last couplets. By investigating the tonal contrasts both within a line and within a couplet, we have summarized the tonal pattern of this special group of lines as: X P Z P Z, X Z X P P.

Chapter 6. Metrico-syntactic Correlation and the Nature of the Recent-style Poetic Prosody

6.1 Introduction

In the previous chapters, we comprehensively analyze the tonal prosody of pentasyllabic Recent-style verse in the collections of several representative poets in the early Tang dynasty and compare it with that of the Yongming style verse. In this chapter we will first discuss the correlation between the syntactic properties and the poetic prosody of the Recent-style verse and then try to reveal the nature of the Recent-style poetic prosody.

Phonology, syntax, and morphology are interconnected in human languages. In Mandarin Chinese, there are a number of examples of the interactions between phonology and morphosyntax, which can be evidenced by Tone 3 sandhi in complex words and phrases. For example, in 總統府 ‘presidential palace’, which is a compound composed of 總統 ‘president’ and 府 ‘palace’, the underlying sequence of third tones (T3+T3+T3) will be changed to T2+T2+T3 on the surface. By contrast, 小雨傘 ‘little umbrella’, which is a modifier-head phrase composed of 小 ‘little’ and 雨傘 ‘umbrella’ and has the same underlying sequence of three third tones, will be pronounced as T3+T2+T3 in its surface form. The different tone sandhi results of these two examples are determined by their morphosyntactic structure (i.e., morphosyntactic bracketing), as can be demonstrated in the

following derivations in (1) and (2), in which “[...]” stands for a morphosyntactic domain, and “(...)” stands for a phonological/prosodic domain.

(1) [[總統]府] ‘presidential palace’

Base Tone T3 T3 T3

(**T2** T3) T3

(T2 **T2** T3)

Sandhi Tone T2 T2 T3

(2) [小[雨傘]] ‘little umbrella’

Base Tone T3 T3 T3

T3 (**T2** T3)

(T3 T2 T3)

Sandhi Tone T3 T2 T3

As we can see in (2), after the T3 of 雨 undergoes tone sandhi, there is no longer applicable environment for Tone 3 Sandhi between 小 and 雨, which is why the T3 of 小 is not changed in this case.

The interactions between phonology and morphosyntax also attract linguists’ attention in the studies on meters of English verse. The iambic pentameter consists of ten syllables,

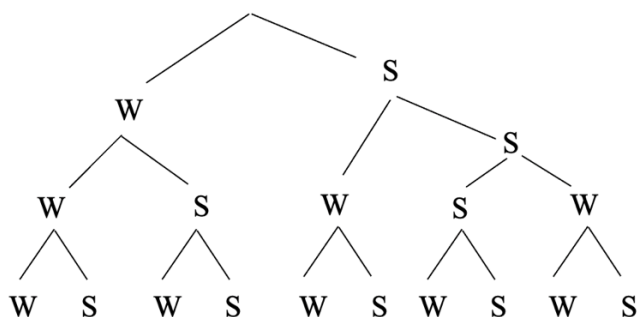
unstressed and stressed alternatingly. The odd positions in iambic pentameter are referred as Weak (W) positions and the even positions are Strong (S) positions. There are many factors concerned with the placement of stress, one of which is word formation. The stress pattern of compound words, such as *'blackbirds*, is different from that of noun phrases, such as *black 'birds*. The former has a stress on *black* while the latter has a stress on *birds*. Kiparsky (1977: 191-192) proposed the following principles on the interaction of stress and word/phrase boundaries in English iambic verse:

(3) The interaction of stress and word/phrase boundaries in English iambic verse (Kiparsky, 1977: 191-192)

- a. Compounds of two monosyllabic words occur in both WS and SW position; of these, SW is strongly favored.
- b. Phrases of two monosyllabic words occur in both WS and SW position; of these, WS is favored.
- c. Polysyllabic (including disyllabic) words must have their strongest stress in S position.

Kiparsky (1977: 230) also proposed a hierarchic binary structure of the iambic pentameter as shown in (4) and suggested that the metrical tension or complexity can be measured by the number of mismatches between metrical structure and syntactic structure (also cf. Chen 1979: 406).

(4)



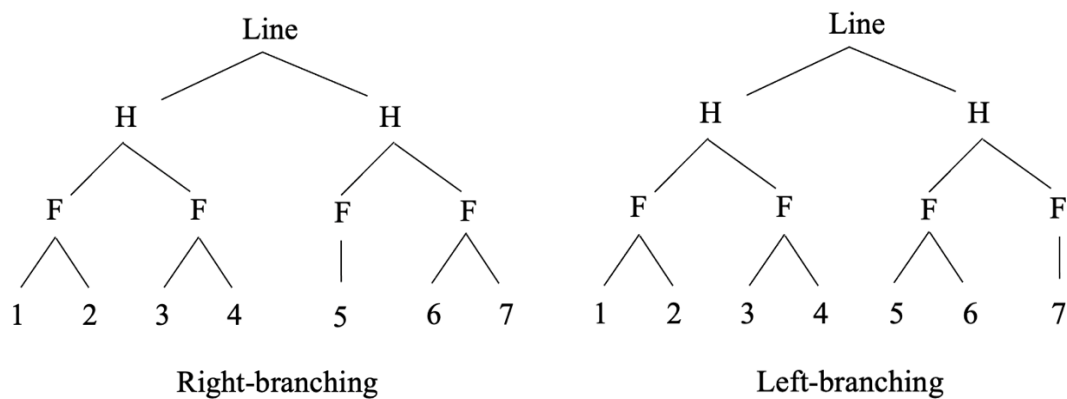
In the field of Chinese poetry study, many studies have also analyzed the surface syntactic structures of Recent-style verse and discussed the correlation between syntactic structure and the metrical patterns. In the next sections, I will summarize the major proposals in the existing research, reanalyze the data, and explore the relationship between syntactic properties and poetic tonal prosody of Recent-style verse.

6.2 Syntactic Considerations in Tonal Prosody of Recent-style Verse in Previous Studies

Chen (1979) was the first research that applied the metrical approach to the study of Chinese poetry. He followed the basic tree structure of English iambic pentameter conjectured by Kiparsky (1977) and proposed that the metrical pattern of Chinese Recent-style verse is iambic as well. According to him, there are two types of hierarchical structures of Chinese Recent-style meter with exclusively binary branching. Each line is

first divided into two half-line or hemistich (H) and each half-line is divided into two metrical feet (F). The last trisyllabic half-line will present either a right-branching or left-branching subtree.

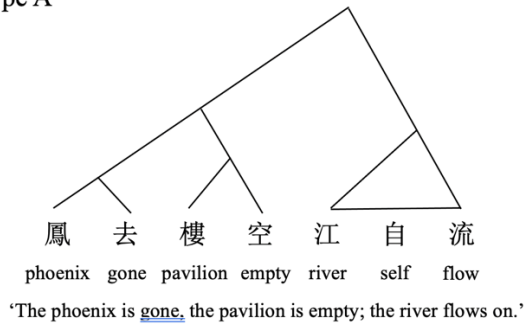
(5) Metrical structures of the heptasyllabic Recent-style verse (Chen 1979: 380)



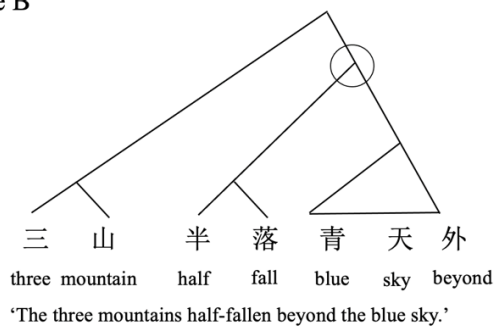
He surveyed the first hundred heptasyllabic Recent-style lines in TSSBS and categorized the surface syntactic structures into 5 groups based on the number of mismatches between syntactic and metrical structures, the hierarchical level of mismatches, and whether the metical feet are split. The mismatches are circled.

(6) Syntactic structures of the first hundred heptasyllabic lines in TSSBS (Chen 1979: 407-410)

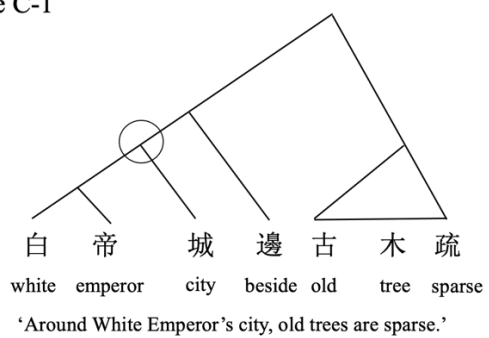
Type A



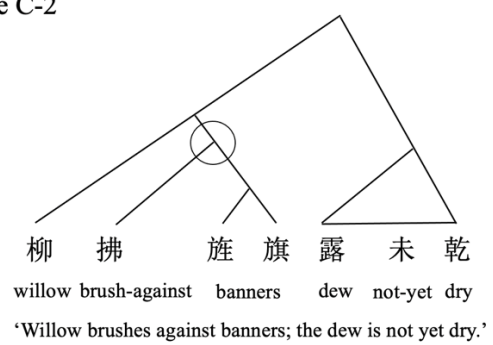
Type B



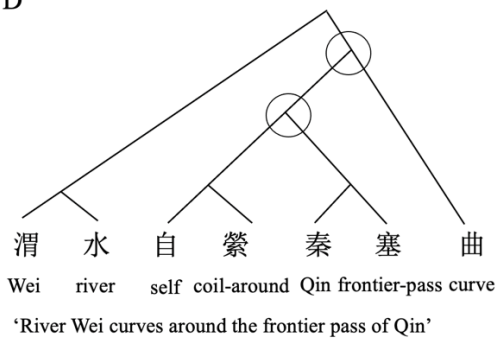
Type C-1



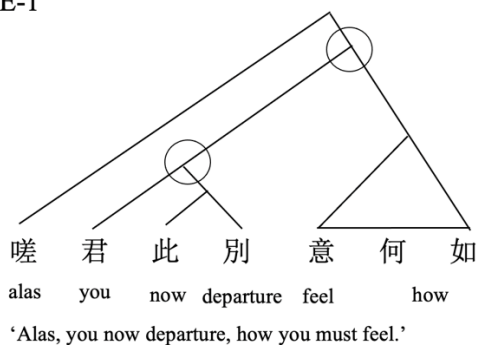
Type C-2



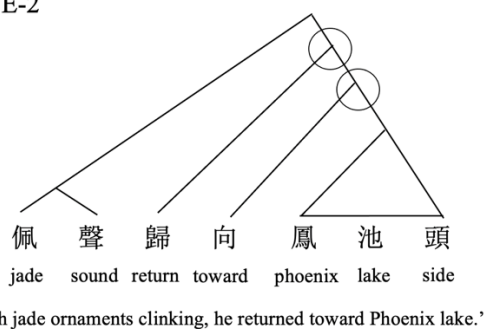
Type D



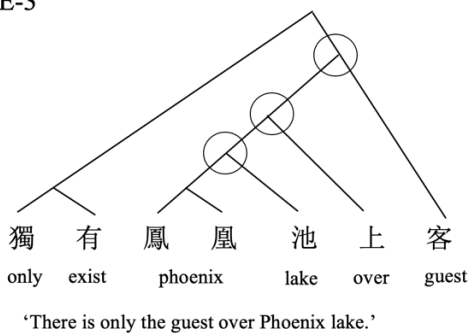
Type E-1



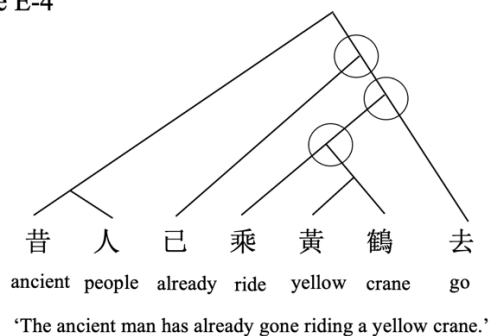
Type E-2



Type E-3



Type E-4



(7) The frequencies of the different syntactic structures in the first hundred heptasyllabic lines in TSSBS (Chen 1979: 407-410)

| Type | Frequency |
|------|-----------|
| A | 51 |
| B | 29 |
| C-1 | 5 |
| C-2 | 3 |
| D | 3 |
| E-1 | 2 |
| E-2 | 1 |
| E-3 | 1 |
| E-4 | 1 |

According to Chen, the less the mismatch between syntactic and prosodic structures, the higher the frequency. Type A perfectly matches the metrical structure, and it occurs most frequently. There is only one deviation in Type B from the metrical norm, hence it is the second most frequent structure. Although Type C also only has one deviation from the metrical norm, it splits the metrical feet, which makes it occur much less than Type B. Type D has the violations in hemistich, a higher level. Type E not only has higher-level mismatches, but also breaks up the metrical feet. Both Type D and E rarely occur in his

data pool.

Duanmu (2004) questioned Chen's (1979) proposal of the correlation between metrical complexity and frequency. He analyzed 1460 lines of Chinese Recent-style verse in TSSBS and had the following observation.

(8) The frequencies of syntactic trees in heptasyllabic lines and their deviations from the metrical patterns (Duanmu 2004: 53)

| Pattern | Tree | Frequency | Percentage (%) | Bad nodes |
|---------|----------------------|-----------|----------------|-----------|
| 1 | [[2 2] [1 2]] | 215 | 31.99 | 0 |
| 2 | [[2 2] [2 1]] | 119 | 17.71 | 0 |
| 3 | [2 /1 /1 [2 1] //] | 63 | 9.38 | 2 |
| 4 | [2 /2 [1 2] //] | 47 | 6.99 | 1 |
| 5 | [[1 /1 2/] [1 2]] | 43 | 6.40 | 1 |
| 6 | [1 /1 /2 [1 2] //] | 26 | 3.87 | 2 |
| 7 | [/ [2 2] 1/ 2] | 2 | 0.30 | 1 |
| 8 | [/ [2 2] 2/ 1] | 2 | 0.30 | 1 |
| 9 | [2 / /2/ 1/] | 2 | 0.30 | 2 |

The first two syntactic trees perfectly match the metrical structures and do not have

any bad nodes. Although they are the two most frequently occurring patterns, they differ sharply - the frequency of the first one is almost twice as high as the second. The third tree has two bad nodes, where deviant brackets are italic. But its frequency is higher than the fourth, fifth, seventh, and eighth which only have one bad node. Duanmu (2004: 66-67) agreed that metrically poor structures are infrequent, but he argued that infrequent structures are not necessarily poor in metric. The reason why Pattern 1 is more common than Pattern 2 is that it is congruent with [S [VO]]. In Chinese, about 60% of the nouns are disyllabic and 90% of the verbs are monosyllabic. Therefore, the final trisyllables with [1 2] structures are more common than those with [2 1].

Du (2016) analyzed the metrico-syntactic correlation from a diachronic perspective. He comprehensively surveyed the syntactic structures and tonal contrasts in the pentasyllabic poems from Han Dynasty to the Northern and Southern Dynasties. He proposed that the Datong 大同 era (535-546) was the crucial period when the occurrence of the “221” syntactic structure increased and led to the tonal prosody changed from the Yongming style (T2-T5 tonal contrast) to the Recent style (T2-T4 tonal contrast). Du (2016) distinguished five subcategories of the “221” syntactic structure, as presented in (9), in which the apostrophe indicates a short pause or no pause, while a slash indicates a comparatively long pause.

(9) Sub-categories of the “221” syntactic structure (Du 2016: 130-136)

I. Type 1 – 2’2’1

This type is a noun phrase. The last trisyllables consist of a disyllabic modifier and a monosyllabic noun, and the first two syllables modify the last trisyllables. There is a very short pause or even no pause between the fourth and fifth syllables. And the pause between the second and the third syllable is short as well.

Example:

青 青’ 河 畔’ 草
green green river bank grass

‘The grass on the river bank is green.’

鬱 鬱’ 園 中’ 柳
flourish flourish garden inside willow

‘The willow in the garden is flourish.’

II. Type 2 – 2/2’1

This type is a verb-object structure or subject-predicate-object structure with the subject omitted. The last trisyllables consist of a disyllabic modifier and a monosyllabic noun. The first two syllables are either a verb phrase serving as the predicate or a noun phrase serving as the subject. The pause between the fourth and fifth syllables are short while that between the second and third syllables are comparatively long.

Example:

日 出/ 東 南’ 隅

sun come out east south corner

‘The sun rises from the southeast.’

照 我/ 秦 氏’ 樓

shine I Qin surname building

‘(The sun) shines on the building of our Qin family.’

III. Type 3 – 2/2/1

Most cases in this type are subject-predicate-object structure or subject-predicate structure. The fifth syllable is often a monosyllabic verb serving as the predicate or monosyllabic noun serving as the object. The pauses between the second and third syllables and between the fourth and fifth syllables are relatively long.

Example:

三 五/ 明 月/ 滿

third five bright moon full

‘On the fifteenth (of every month) the moon is full.’

四 五/ 蟾 兔/ 闕

fourth five hare deficiency

‘On the twentieth (of every month) the moon will wane.’

IV. Type 4 – 2'2/1

This type is a subject-predicate structure. The first two syllables are usually alliterative or assonant adjectives, modifying the subsequent disyllabic nouns or noun phrases. The last syllable is a verb or an adjective serving as the predicate.

Example:

習 習' 和 風/ 起

breezy breezy zephyr rise

'The breezy zephyr is rising.'

采 采' 彤 雲/ 浮

lush lush red cloud float

'The lush red clouds are floating.'

V. Type 5 – 2//2/1

In this type, the first two syllables and the last three syllables respectively form two subject-predicate phrases. The two clauses may be in a parallel, causal, or adversative relation. The pause between the second and third syllables is the longest among all types because it is the boundary between two clauses. There is also a noticeable pause between the fourth and fifth syllables as it is the boundary between the subject and the predicate.

Example:

野 曠// 沙 岸/ 淨

field vast sand bank clean

‘The field is vast, and the sandy bank is clean.’

天 高// 秋 月/ 明

sky high autumn moon bright

‘The sky is high, and the autumn moon is bright.’

Du (2016: 141-144) proposed two arguments for the conclusion that the Datong era is the critical period when the poetic tonal prosody changed from T2-T5 contrast to T2-T4 contrast: (a) the proportions of the lines with the “221” syntactic structure increased remarkably compared to the previous periods, and (b) the poets in the Datong era preferred Types 2, 3, and 5 where there are noticeable pauses after the second and the fourth syllables. According to Du (2016), in the “221” structure, the second and the fourth syllables are followed by pauses and thus the poets need to manipulate the tones of these two syllables—making them contrast with each other—to highlight their unique rhythmic positions, which is why T2-T4 contrast became prevailing.

6.3 Reanalysis of the Data in Du (2016)

Du (2016) comprehensively analyzed the tonal contrasts and the syntactic structures of the important poets’ collections from the Han dynasty (202 BC-220) to the Liang period

(502-557) in Northern and Southern dynasties (386-589), as presented in (10).

(10) The tonal contrasts and the syntactic structures in different dynasties (adapted from Du (2016: 148-153))

| Dynasty | Total lines | Syntactic Structure | | Tonal Contrast | |
|---------------------|----------------|---------------------|---------------|----------------|---------------|
| | | 212 | 221 | T2 ≠ T5 | T2 ≠ T4 |
| Han (202 BC-220) | 654 | 457 (69.88%) | 197 (30.12%) | 438 (66.97%) | 345 (52.75%) |
| Jin (265-420) | 1378 | 1078 (78.23%) | 300 (21.77%) | 1029 (74.67%) | 998 (72.42%) |
| Qi (479-502) | 3793 | 2755 (72.63%) | 1038 (27.37%) | 3268 (86.18%) | 2971 (78.35%) |
| Liang (502-557) | 9254 | 6207 (67.07%) | 3047 (32.93%) | 7224 (78.06%) | 8444 (91.25%) |

One apparent trend is the ratios of the lines with the T2-T4 tonal contrast increased diachronically, gradually rising from 52.75% in the Han dynasty to 91.25% in the Liang period. The ratio of the T2-T5 contrast reached its peak in the Qi period and then decreased in the Liang period. On the contrary, the diachronic development of poetic syntactic structures didn't show a clear pattern. The proportion of the lines with the "212" structure

increased by about 10% from the Han dynasty to the Jin dynasty, and then decreased to 67% in the Liang period. The proportion of the lines with the “221” structure decreased first and then moderately rose to 32%. Overall, the change in the percentages of different syntactic structures is not as drastic as that of different tonal contrasts, especially the T2-T4 contrast.

However, we do see a subtle increase in “221” structure from the Qi period to the Liang; and coincidentally, the ratio of the T2-T4 contrast lines increased as well. Then the question is whether there is any correlation between these two.

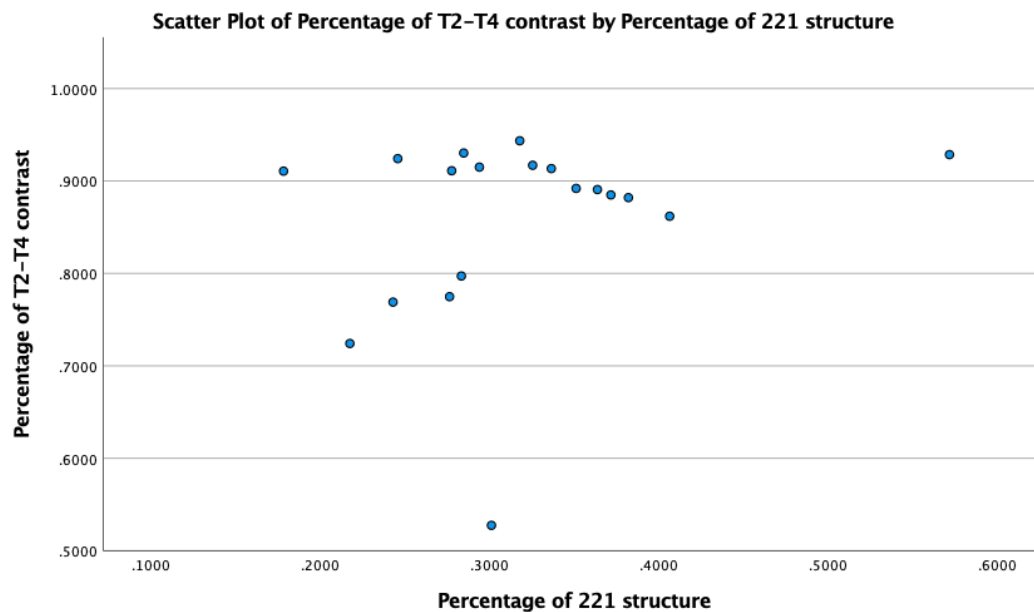
(11) The tonal contrasts and the syntactic structures in different poets' collections (adapted from Du (2016: 148-153))

| Poets/ collections | Total lines | Syntactic Structure | | Tonal Contrast | |
|-----------------------|----------------|---------------------|--------------|------------------|------------------|
| | | 212 | 221 | T2 ≠ T5 | T2 ≠ T4 |
| Han collections | 654 | 457 (69.88%) | 197 (30.12%) | 438 (66.97%) | 345 (52.75%) |
| Xie Lingyun | 1378 | 1078 (78.23%) | 300 (21.77%) | 1029 (74.67%) | 998 (72.42%) |
| Wang Rong | 658 | 498 (75.68%) | 160 (24.32%) | 571 (86.78%) | 506 (76.90%) |
| Xie Tiao | 1598 | 1145 (71.65%) | 453 (28.35%) | 1375 (86.05%) | 1274 (79.72%) |

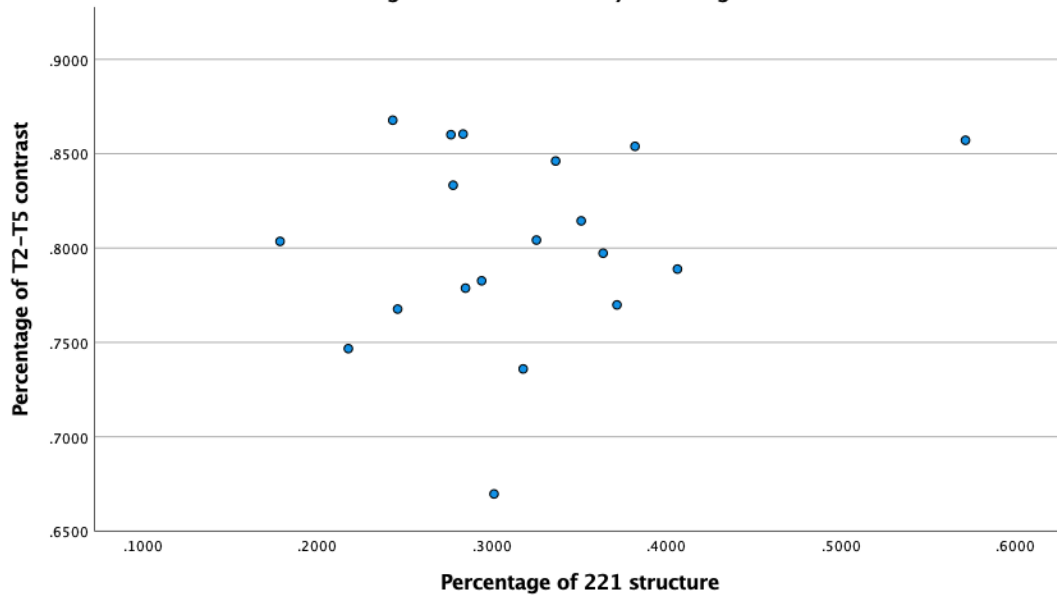
| | | | | | |
|------------------|------|------------------|--------------|------------------|------------------|
| Shen Yue | 1537 | 1112 (72.35%) | 425 (27.65%) | 1322 (86.01%) | 1191 (77.49%) |
| Liu Xiaochuo | 630 | 374 (59.37%) | 256 (40.63%) | 497 (78.89%) | 543 (86.19%) |
| Liu Huan | 113 | 71 (62.83%) | 42 (37.17%) | 87 (76.99%) | 100 (88.50%) |
| Liu Xiaowei | 612 | 432 (70.59%) | 180 (29.41%) | 479 (78.27%) | 560 (91.50%) |
| Xu Chi | 28 | 12 (42.86%) | 16 (57.14%) | 24 (85.71%) | 26 (92.86%) |
| Liu Xiaoyi | 104 | 69 (66.35%) | 35 (33.65%) | 88 (84.62%) | 95 (91.35%) |
| Xiao Wang | 2204 | 1430 (64.88%) | 774 (35.12%) | 1795 (81.44%) | 1966 (89.20%) |
| Yu Jianwu | 805 | 607 (75.40%) | 198 (24.60%) | 618 (76.77%) | 744 (92.42%) |
| Xiao Yi | 888 | 565 (63.63%) | 323 (36.37%) | 708 (79.73%) | 791 (89.08%) |
| Liu Xiaosheng | 90 | 65 (72.22%) | 25 (27.78%) | 75 (83.33%) | 82 (91.11%) |
| Liu Xiaoxian | 56 | 46 (82.14%) | 10 (17.86%) | 45 (80.36%) | 51 (91.07%) |
| Xiao Que | 178 | 110 (61.80%) | 68 (38.20%) | 152 (85.39%) | 157 (88.20%) |
| Wang Bao | 470 | 317 (67.45%) | 153 (32.55%) | 378 (80.43%) | 431 (91.70%) |
| Yu Xin | 2746 | 1873 (68.21%) | 873 (31.79%) | 2021 (73.60%) | 2591 (94.36%) |
| Xu Ling | 330 | 236 (71.52%) | 94 (28.48%) | 257 (77.88%) | 307 (93.03%) |

The above table lists the occurrences and proportions of the syntactic structures and the tonal contrasts in the main poets' collections. By applying Pearson correlation coefficient test in SPSS to the proportions, we can verify whether there is a correlation between the change in syntactic structures and the change in tonal contrasts. I respectively analyzed four sets of variables: "221" syntactic structure and the T2-T4 contrast, "221" syntactic structure and the T2-T5 contrast, "212" syntactic structure and the T2-T4 contrast, and "212" syntactic structure and the T2-T5 contrast. The results are as the follows.

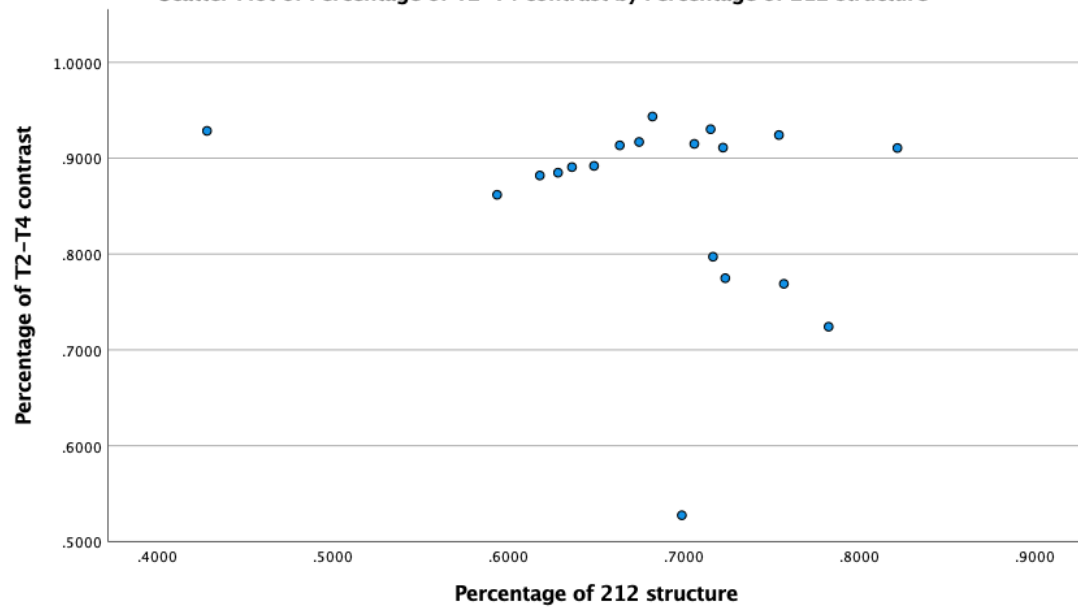
(12) Scatter Plots of the four sets of variables

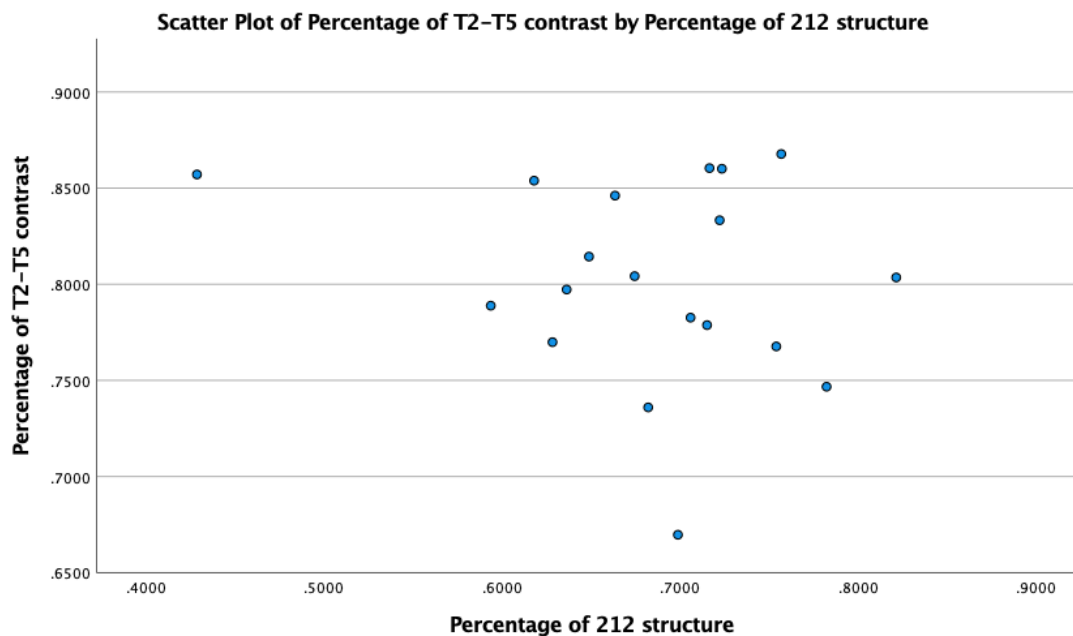


Scatter Plot of Percentage of T2-T5 contrast by Percentage of 221 structure



Scatter Plot of Percentage of T2-T4 contrast by Percentage of 212 structure





Above are the scatter plots of the four sets of variables. The higher the correlation of the two sets of variables (in either positive or negative direction), the more linear the shape of the scattered dots. Apparently, the shapes in the second and fourth plots are far from linear. Part of the shapes in the first and third plots are linear, but there are also many outliers.

(13) Pearson correlation coefficient of the four sets of variables

| | | Percentage of 221 structure | Percentage of T2-T4 contrast |
|--------------------------------|---------------------|--------------------------------|---------------------------------|
| Percentage of 221 structure | Pearson Correlation | 1 | .248 |
| | Sig. (2-tailed) | | .307 |

| | | | |
|------------------------------|---------------------|------|----|
| | N | 19 | 19 |
| Percentage of T2-T4 contrast | Pearson Correlation | .248 | 1 |
| | Sig. (2-tailed) | .307 | |
| | N | 19 | 19 |

| | | | |
|------------------------------|---------------------|--------------------------------|---------------------------------|
| | | Percentage of 221 structure | Percentage of T2-T5 contrast |
| Percentage of 221 structure | Pearson Correlation | 1 | .204 |
| | Sig. (2-tailed) | | .403 |
| | N | 19 | 19 |
| Percentage of T2-T5 contrast | Pearson Correlation | .204 | 1 |
| | Sig. (2-tailed) | .403 | |
| | N | 19 | 19 |

| | | | |
|-----------------------------|---------------------|--------------------------------|---------------------------------|
| | | Percentage of 212 structure | Percentage of T2-T4 contrast |
| Percentage of 212 structure | Pearson Correlation | 1 | -.248 |
| | Sig. (2-tailed) | | .307 |
| | N | 19 | 19 |

| | | | |
|------------------------------|---------------------|-------|----|
| Percentage of T2-T4 contrast | Pearson Correlation | -.248 | 1 |
| | Sig. (2-tailed) | .307 | |
| | N | 19 | 19 |

| | | Percentage of 212 structure | Percentage of T2-T5 contrast |
|------------------------------|---------------------|-----------------------------|------------------------------|
| Percentage of 212 structure | Pearson Correlation | 1 | -.204 |
| | Sig. (2-tailed) | | .403 |
| | N | 19 | 19 |
| Percentage of T2-T5 contrast | Pearson Correlation | -.204 | 1 |
| | Sig. (2-tailed) | .403 | |
| | N | 19 | 19 |

In the above tables, Pearson's r is 0.248, 0.204, -0.248, and -0.204 respectively. All of them are smaller than 0.456 ($n=19$, 2-tailed, $\alpha=0.05$), showing that there is no correlation between the percentages of the syntactic structures and that of the tonal contrasts, and thus the change in the syntactic structures is not a factor triggering the change in the tonal contrasts. Therefore, Du's (2016) hypothesis about the relationship between the increase of the "221" syntactic structure and the increase of T2-T4 contrast is somewhat groundless.

6.4 The Nature of the Recent-style Poetic Prosody

In Section 3 we have proved that the increase of lines with “221” syntactic structure is not the factor leading to the changes in the tonal contrasts. In fact, a large quantity of poems exhibits the mismatch between the syntactic structure and the prosodic pattern. In the Recent-style poems, the strict tonal rules are usually concerned with the even syllables and the last rhyming syllables. The prosodic patterns can be simplified to [XA][XB][R] for the pentasyllabic lines and [XA][XB][XA][R] for the heptasyllabic line, in which the tonal categories of A and B should be different. However, the syntactic structures of the poetic lines are various as presented in (14).

(14) Syntactic structures of the pentasyllabic lines in TSSBS (Duanmu 2004: 81)

| Syntactic structure | Frequency | Proportion |
|---------------------|-----------|------------|
| [2 [1 2]] | 424 | 53.81 |
| [2 [2 1]] | 192 | 24.37 |
| [1 [1 [2 1]]] | 86 | 10.91 |
| [1 [1 [1 2]]] | 32 | 4.06 |
| [1 [[1 2] 1]] | 31 | 3.93 |
| [[2 2] 1] | 12 | 1.52 |
| [[1 [1 2]] 1] | 5 | 0.63 |

| | | |
|---------------|---|------|
| [[2 1] 2] | 4 | 0.51 |
| [[[2 1] 1] 1] | 1 | 0.13 |
| [[1 2] 2] | 1 | 0.13 |

(15) 漁 人 網 集 澄 潭 下
 fisherman net gather clear pond under
 “The fishermen’s nets gather under the clear pond.”

Syntactic structure [X X X] [X] [X X] [X]
 Metrical structure [X P] [X Z] [X P] [Z]

 賈 客 船 隨 返 照 來
 businessman boat follow return sunlight come
 “The businessmen’s boats come following the sunset glow.”

Syntactic structure [X X X] [X] [X X] [X]
 Metrical structure [X Z] [X P] [X Z] [P]

(15) presents an example that well demonstrates the mismatch between the syntactic and metrical patterns²⁶. This is the second couplet from Du Fu’s 杜甫 (712-770) “Ye lao” 野老. The subject in the upper line is a trisyllabic noun phrase and the predicate is a

²⁶ This example is provided by Prof. Hongming Zhang in his seminar on poetic prosody in 2014 Fall.

monosyllabic verb followed by a preposition phrase. The subject of the bottom line is also a trisyllabic noun phrase followed by an adjunct phrase and the predicate is a monosyllabic verb located at the end of the line. The syntactic structure in both lines is “3121” while the metrical pattern is “2221”.

Up to this point, we have illustrated the metrico-syntactic mismatch and disproved that the syntactic factor influenced the metrical patterns. Nevertheless, the fundamental question persists—what generated the development of the metrical patterns? Specifically, why the four tones were categorized into two groups—*ping* and *ze* in the early Tang? And what factor motivated the poetic tonal prosody changing from the Yongming style to the Recent style?

Zhang (2020: 7) pointed out two different ways to create binary contrasted poetic meters cross-linguistically. In some languages the binary metrical prominent contrasts are their linguistic properties which are ready to use for creating poetic meters. One example is English. English is a stress language which already has the contrast between stress and unstress. Based on this linguistic property, English poetic meters, such as iambus and trochee, are created. However, in some languages like Chinese, there is no ready-to-use binary metrical prominent contrasts. Middle Chinese has four tones with different pitches and contours. *Ping* is a level tone; *shang* is a high rising tone; *qu* is a falling tone; and *ru* is a check tone with a stop consonant. Why literati in the Tang dynasty purposefully created a contrast between *ping* tone and the other three tones? Zhang proposed that the

fundamental difference between *ping* tone and the other three tones is *ping* tone can be prolonged and maintain its contour while the other three cannot maintain their contours or pitches if prolonged. The motivation for this grouping is that the Recent-style verse was not only created for reading or reciting, but more importantly, it was created for chanting. The rule of chanting requires some syllables at certain positions should be prolonged and some should be not. They are pre-set patterns regardless of the syntactic structures. The binary contrasted poetic meters of the Recent style were thus created based on the performance of linguistic properties.

Poems can be performed in various ways—singing, reciting, chanting, etc. (Zhang 2020: 9). Many poems in *Shijing* 詩經 (Book of Songs), the earliest existing collections of Chinese poetry, were ritual songs or folk songs. In the Han dynasty, one of the duties of the Music Bureau was to collect or write lyrics which were called *yuefu shi* 樂府詩 (Music Bureau Poetry). During this period, poems were lyrics and whether a syllable should be prolonged or not was determined by music melody (Zhang 2020: 10). In the Warring States period (c.475-221 BCE), poems were separated from music and developed as an independent genre. The literati in the Yongming era first discovered the four tones of the Middle Chinese and started their poetic creations based on this finding. Perhaps inspired by monks chanting Sanskrit Buddhist scriptures and a special practice—*changxiao* 長嘯 (whistling)—of the literati in the Wei and Jin dynasties, Yongming poets realized that poems could be performed by chanting. Thus, they started the experiments of establishing

the rules of poetic chanting, which consummated in the Tang dynasty²⁷.

6.5 Summary

This chapter mainly discusses two issues: (a) whether there is any correlation between poetic syntactic structures and prosodic patterns; and (b) the nature of the Recent-style poetic prosody. By applying the Pearson correlation coefficient test to reanalyze the data in the previous studies, we have proved that there is no correlation between the syntactic structures and the poetic metrical patterns. The metrico-syntactic mismatch vastly exists in the poetry anthologies.

Cross-linguistically, the poetic meters can be created based on the linguistic property or the performance of linguistic property. The Recent-style prosody belongs to the latter. Poems can be performed in various ways, including singing, reciting, chanting, etc. The Recent-style verse has its unique way of performance—chanting, based on which the pre-set metrical rules were created to regulate which syllables can be prolonged and which cannot. This was also the motivation of the poets to categorize the four tones into *ping* and *ze*. The fundamental feature that distinguishes *ping* tone from the other three is that it can be prolonged without changing its original pitch and contour, which is not possible for the other three tones.

²⁷ This paragraph is inspired by the discussion with Prof. Hongming Zhang in his seminar on poetic prosody in Fall 2021.

Chapter 7. Conclusion

7.1 Summary of the Major Findings

This dissertation is a statistical investigation of some long-standing questions about tonal prosody of the Recent-style verse, including but not limited to (a) what the tonal patterns of Recent-style verse are, (b) what the critical features of the tonal prosody in Recent-style verse are, and (c) how the tonal prosody in Recent-style verse was developed throughout the history. To answer these questions, this dissertation thoroughly analyzes the data collected from representative poets' anthologies from the Yongming era to the high Tang period, on the basis of statistical tests. The major findings of this dissertation are summarized as follows.

First, the tonal prosody of the Yongming style verse is built based on the four tones instead of the contrast of *ping* and *ze*. In Chapter 3, I conducted four sets of chi-square tests to the Yongming collections to investigate: (a) whether the *ping-ze* distributions at a certain position are identical; (b) whether the distributions of four tones at a certain position are identical; (c) whether the distributions of four tones at a certain position of the *ping* rhyming couplets are identical; and (d) whether the distributions of four tones at a certain position of the *ze* rhyming couplets are identical. The results show that (a) there are 5 positions where the *ping-ze* distributions are identical; (b) there are 6 positions where the

distributions of four tones are identical; (c) there are 7 positions where the distributions of four tones in the *ping* rhyming couplets are identical; and (d) there are 9 positions where the distributions of four tones in the *ze* rhyming couplets are identical. In the Yongming collections, more positions show identical distributions of the four tones than the *ping-ze* distributions, which proves that the Yongming style tonal prosody was created based on the four tones, rather than the *ping-ze* contrast.

Second, in the early Tang period, there are three strict tonal contrast rules: T2-T4 contrast in the bottom line of a couplet, T2-T7 contrast, and T5-T10 tonal contrast. Over 95% of the syllables at the above pair-wise positions have different tones and the rates of the tonal contrasts are identical among different early Tang poets' collections. In addition to the three strict rules, there are also strong tendencies for the syllables in the following positions to have different tones: T2-T4 in the upper line, T2-T3 in the bottom line, T3-T4 in the bottom line, T3-T8, and T4-T9.

Third, both Shen Quanqi and Song Zhiwen strictly followed the requirements of *dui* and *nian* in the pentasyllabic Recent-style poems. There is no difference in the strictness of applying *dui* and *nian*, which is opposite to Wang Li's observation (1958: 116-122).

Fourth, there is a special tonal pattern—X P Z P Z, X Z X P P—where T2 and T4 have the same tone in the Tang dynasty. In our data pool, most lines of this pattern have two *ping*-tone syllables at T2 and T4. In the early Tang collections, this type of lines seldom appears in the first couplet, but in the high Tang collections, it almost evenly appears in the

first, middle, and last couplets.

Fifth, by applying Pearson correlation coefficient test, we prove that the syntactic change was not the factor that led to the change of poetic meters from the Yongming style to the Recent style. The metrico-syntactic mismatches widely exist in poetry. The metrical patterns of the Recent-style verse are pre-set and its way of performance—chanting—requires the syllables at certain positions be prolonged, and the fundamental difference between *ping* and the other three tones is that *ping* tone can be prolonged without changing its contour and pitch (Zhang, 2020).

7.2 Limitations and Suggestions for Future Research

One limitation of this study is the size of the sample data. Ideally, it will be more objective and inclusive if all the extant poetic anthologies from the Northern and Southern dynasties to the Tang dynasty could be investigated. This mammoth project will bring us a deeper and more comprehensive insight into Chinese poetic prosody. However, due to restrictions of time and manpower, this study only includes several representative poets' collections of different dynasties.

Another limitation is concerned with the selection of the sample data. Among the nine collections investigated in this study, eight of them are the anthology of a single poet while the last one, TSSBS, is an anthology that contains poems purposefully selected from

multiple authors in the Tang dynasty. Some tests in this dissertation have showed that there are obvious differences between the early Tang collections and TSSBS. For example, in the early Tang collections, the special tonal pattern where T2 and T4 have the same tone seldom appears in the first couplet; while in the high Tang collection, it appears evenly in the first, middle, and last couplets. This could be one of the differences between these two periods, and it could also be caused by the multiple authorship of TSSBS. In a single poet's collection, it may be rare that the special tonal pattern appears in the first couplet. But the ratio would increase if pomes with the special pattern in the first couplet were compiled into one collection. The development from the early Tang period to the high Tang period will be a topic investigated in the future.

Moreover, how Chinese poetic prosody was developed throughout the history is not purely a linguistic issue²⁸. The earliest poems were songs sung among folk people or in ritual ceremonies. Later poems were separated from music and gradually developed into an independent genre with different ways of performance. Accompanied with the development of poetry, Buddhism spread to China from ancient India starting from the Han dynasty. In the Tang dynasty, the composition of the Recent-style verse was part of the Imperial Civil Examination. Did these events affect the poetic prosody? How did these events influence the evolution of poetic prosody? These are all important topics for future

²⁸ This paragraph is inspired by the discussion with Prof. Hongming Zhang in his seminar on poetic prosody in Fall 2021.

research. Together with linguistic research, studies from the fields of literature, philology, translatology, history, folklore, etc. can all contribute to deepening our understanding of the evolution of poetic prosody.

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Appendix

Poems Analyzed in this Dissertation

A. Shen Yue 沈約

從齊武帝瑯琊城講武應詔詩

三日侍林光殿曲水宴應制詩

侍宴樂遊苑餞呂僧珍應詔詩

正陽堂宴勞凱旋詩

游鍾山詩應西陽王教

登高望春詩

遊金華山詩

留真人東山還詩

登玄暢樓詩

酬謝宣城朓詩

新安江至清淺深見底貽京邑遊好詩

送別友人詩

去東陽與吏民別詩

早發定山詩

循役朱方道路詩

和竟陵王遊仙詩二首

遊沈道士館詩

酬華陽陶先生詩

還園宅奉酬華陽先生詩

華陽先生登樓不復下贈呈詩

奉華陽王外兵詩

赤松澗詩

八關齋詩

古意詩

少年新婚為之詠詩

登北固樓詩

夢見美人詩

直學省愁臥詩

休沐寄懷詩

宿東園詩

行園詩

和左丞庾杲之移病詩

和竟陵王抄書詩

詠竹火籠詩

奉和竟陵王郡縣名詩

奉和竟陵王藥名詩

和陸慧曉百姓名詩

三月三日率爾成章詩

織女贈牽牛詩

應王中丞思遠詠月詩

和王中書德充詠白雲詩

詠雪應令詩

和劉雍州繒博山香爐詩

詠湖中鴈詩

冬節後至丞相第詣世子車中作詩

奉和竟陵王經劉瓛墓詩

悼亡詩

侍遊方山應詔詩

樂將殫恩未已應詔詩

泛永康江詩

餞謝文學離夜詩

別范安成詩

效古詩

庭雨應詔詩

初春詩

春詠詩

傷春詩

秋夜詩

詠篋詩

詠竹檳榔盤詩

詠簷前竹詩

翫庭柳詩

麥李詩

詠桃詩

詠青苔詩

十詠二首 領邊繡

十詠二首 腳下履

懷舊詩九首 傷王融

懷舊詩九首 傷謝朓

懷舊詩九首 傷庾杲之

懷舊詩九首 傷王湛

懷舊詩九首 傷虞炎

懷舊詩九首 傷李珪之

懷舊詩九首 傷韋景猷

懷舊詩九首 傷劉渢

懷舊詩九首 傷胡諧之

詠新荷應詔詩

聽蟬鳴應詔詩

詠笙詩

詠箏詩

詠山榴詩

大言應令詩

細言應令詩

詠餘雪詩

詠帳詩

侍宴詠反舌詩

寒松詩

詠孤桐詩

詠梧桐詩

園橘詩

詠梨應詔詩

西地梨詩

詠芙蓉詩

詠杜若詩

詠鹿蔥詩

詠甘蕉詩

詠菰詩

早行逢故人車中為贈詩

為鄰人有懷不至詩

四城門詩

和劉中書仙詩二首

華山館為國家營功德詩

和王衛軍解講詩

侍宴謝朓宅錢東歸應詔詩

酬孔通直邊懷蓬居詩

石塘瀨聽猿詩

出重圍和傅昭詩

秋晨羈怨望海思歸詩

侍宴樂游苑錢徐州刺史應詔詩

憩郊園和約法師採藥詩

詠竹詩

詩

B. Xie Tiao 謝朓

遊山詩

遊敬亭山詩

將遊湘水尋句溪詩

遊東田詩

答王世子詩

答張齊興詩

暫使下都夜發新林至京邑贈西府同僚詩

酬王晉安德元詩

郡內高齋閒望答呂法曹詩

在郡臥病呈沈尚書詩

別王丞僧孺詩

同羈夜集詩

新亭渚別范零陵雲詩

忝役湘州與宣城丈吏民別詩

懷故人詩

始之宣城郡詩

之宣城郡出新林浦向板橋詩

休沐重還丹陽道中詩

京路夜發詩

晚登三山還望京邑詩

始出尚書省詩

直中書省詩

觀朝雨詩

宣城郡內登望詩

冬日晚郡事隙詩

高齋視事詩

冬緒羈懷示蕭諮議虞田曹劉江二常侍詩

落日悵望詩

賽敬亭山廟喜雨詩

賦貧民田詩

移病還園示親屬詩

治宅詩

秋夜講解詩

春思詩

秋夜思

詠風詩

詠竹詩

詠落梅詩

詠牆北梔子詩

奉和竟陵王同沈右率過劉先生墓詩

和何議曹郊遊詩二首

和劉西曹望海臺詩

和宋記室省中詩

和王著作融八公山詩

和伏武昌登孫權故城詩

夏始和劉潺陵詩

新治北窗和何從事詩

和王主簿季哲怨情詩

和徐都曹出新亭渚詩

和劉中書繪入琵琶峽望積布磯詩

和蕭中庶直石頭詩

和王長史臥病詩

和江丞北戍琅邪城詩

和沈祭酒行園詩

奉和隨王殿下詩十六首

和紀參軍服散得益詩

和王中丞聞琴詩

贈王主簿詩二首

和別沈右率諸君詩

離夜詩

將發石頭上烽火樓詩

望三湖詩

送江水曹還遠館詩

送江兵曹檀主簿朱孝廉還上國詩

臨溪送別詩

後齋迴望詩

與江水曹至干濱戲詩

祀敬亭山廟詩

出下館詩

落日同何儀曹煦詩

夜聽妓詩二首

詠薔薇詩

詠蒲詩

詠兔絲詩

遊東堂詠桐詩

鏡臺

燈

燭

琴

烏皮隱几

席

詠竹火籠

詠鸕鶿

至尋陽詩

詩

阻雪連句遙贈和

還塗臨渚

紀功曹中園

閒坐

侍筵西堂落日望鄉

往敬亭路中

祀敬亭山春雨

C. Wang Rong 王融

從武帝琅邪城講武應詔

棲玄寺聽講畢遊邸園七韻應司徒教

雜體報范通直

蕭諮議西上夜集

別王丞僧孺

寒晚敬和何徵君點

古意二首

奉和竟陵王郡縣名

遊仙詩五首

大慚愧門詩

春遊迴文詩

侍遊方山應詔

奉辭鎮西應教

餞謝文學離夜

和南海王殿下詠秋胡妻

詠琵琶

詠幔

藥名

星名

奉和月下

詠池上梨花

詠梧桐

詠女蘿

移席琴室應司徒教

抄眾書應司徒教

奉和代徐二首

擬古二首

四色詠

離合賦物為詠詠火

後園作迴文詩

雙聲詩

D. Xue Daoheng 薛道衡

從駕幸晉陽詩

奉和月夜聽軍樂應詔詩

奉和臨渭應詔詩

秋日遊昆明池詩

敬酬楊僕射山齋獨坐詩

重酬楊僕射山亭詩

入郴江詩

渡北河詩

和許給事善心戲場轉韻詩

展敬上鳳林寺詩

從駕天池應詔詩

梅夏應教詩

人日思歸詩

夏晚詩

歲窮應教詩

詠苔紙詩

E. Shangguan Yi 上官儀

奉和過舊宅應制

安德山池宴集

王昭君

詠雪應詔

奉和山夜臨秋

江王太妃挽歌

故北平公挽歌

高密長公主挽歌

奉和秋日即目應制

入朝洛堤步月

從駕閭山詠馬

F. Du Shenyan 杜審言

蓬萊三殿侍宴奉敕詠終南山應制

望春亭侍游應詔

宿羽亭侍宴應制

歲夜安樂公主滿月侍宴應制

奉和七夕侍宴兩儀殿應制

大酺

賦得妾薄命

和韋承慶過義陽公主山池五首

和晉陵陸丞早春遊望

秋夜宴臨津鄭明府宅

和康五庭芝望月有懷

登襄陽城

旅寓安南

春日懷歸

代張侍禦傷美人

送高郎中北使

都尉山亭

夏日過鄭七山齋

送崔融

經行嵐州

重九日宴江陰

除夜有懷

晦日宴遊

七夕

扈從出長安應制

春日江津遊望

泛舟送鄭卿入京

度石門山

贈崔融二十韻

贈蘇味道

和李大夫嗣真奉使存撫河東

G. Shen Quanqi 沈佺期

有所思

入衛作

黃鶴

立春日內出彩花應制

晦日滻水應制

奉和洛陽玩雪應制

三日梨園侍宴

幸梨園亭觀打球應制

九日臨渭亭侍宴應制得長字

歲夜安樂公主滿月侍宴

安樂公主移入新宅

仙萼亭初成侍宴應制

送金城公主適西蕃應制

幸白鹿觀應制

洛陽道

驄馬

巫山高二首

七夕

春閨

奉和聖制同皇太子游慈恩寺應制

和洛州康士曹庭芝望月有懷

壽陽王花燭

隴頭水

折楊柳

紫騮馬

被試出塞

牛女

雜詩三首

剪綵

和中書侍郎楊再思春夜宿直

和常州崔使君寒食夜

和崔正諫登秋日早朝

答寧處州書

李舍人山園送龐邵

送陸侍禦餘慶北使

洛州蕭司兵謁兄還赴洛成禮

餞高唐州詢

餞唐郎中洛陽令

樂城白鶴寺

游少林寺

嶽館

早發平昌島

夜宿七盤嶺

十三四時嘗從巫峽過他日偶然有

初達驩州

嶺表逢寒食

驩州南亭夜望

少遊荊湘因有是題

咸陽覽古

覽鏡

題椰子樹

同獄者歎獄中無燕

則天門赦改年

喜赦

秦州薛都督挽詞

天官崔侍郎夫人盧氏挽歌

章懷太子靖妃挽詞

陪幸韋嗣立山莊

扈從出長安應制

初冬從幸漢故青門應制

昆明池侍宴應制

白蓮花亭侍宴應制

仙萼池亭侍宴應制

奉和晦日駕幸昆明池應制

奉和聖制幸禮部尚書竇希玠宅

同李舍人冬日集安樂公主山池

酬蘇員外味道夏晚寓直省中見贈

和韋舍人早朝

自考功員外授給事中

和元舍人萬頃臨池玩月戲為新體

酬楊給事兼見贈台中

九真山淨居寺謁無礙上人

夜遊

登瀛州南城樓寄遠

塞北二首

李員外秦援宅觀妓

送韋商州弼

夏日梁王席送張岐州

夏日都門送司馬員外逸客孫員外

送盧管記仙客北伐

移禁司刑

入鬼門關

三日獨坐驩州思憶舊遊

從驩州廡宅移住山間水亭贈蘇使

赦到不得歸題江上石

答魑魅代書寄家人

度安海入龍編

從崇山向越常

哭蘇眉州崔司業二公

哭道士劉無得

寒食

句

H. Song Zhiwen 宋之問

息夫人

洞庭湖

傷王七秘書監寄呈揚州陸長史通

折楊柳

奉和立春日侍宴內出剪綵花應制

春日芙蓉園侍宴應制

夏日仙萼亭應制

奉和九月九日登慈恩寺浮屠應制

奉和九日幸臨渭亭登高應制得風字

奉和聖制閏九月九日登莊嚴總持二寺閣

麟趾殿侍宴應制

上陽宮侍宴應制得林字

幸少林寺應制

幸嶽寺應制

扈從登封途中作

扈從登封告成頌

松山嶺應制

緱山廟

奉和梁王宴龍泓應教得微字

壽陽王花燭圖

牛女

冬夜寓直麟閣

登禪定寺閣

陸渾山莊

藍田山莊

春日山家

春日宴宋主簿山亭得寒字

江亭晚望

秋晚遊普耀寺

答李司戶夔

寄天臺司馬道士

使往天平軍馬約與陳子昂新鄉為期，及不遇而還

過函谷關

送朔方何侍郎

送田道士使蜀投龍

送許州宋司馬赴任

送趙司馬赴蜀州

送永昌蕭贊府

送李侍禦

餞湖州薛司馬

送杜審言

送武進鄭明府

送姚侍禦出使江東

留別之望舍弟

漢江宴別

初發荊府贈長史

晚泊湘江

過蠻洞

經梧州

渡吳江別王長史

泛鏡湖南溪

途中寒食題黃梅臨江驛寄崔融

遊韶州廣界寺

宿清遠峽山寺

題大庾嶺北驛

度大庾嶺

端州別袁侍郎

過史正議宅

梁宣王挽詞三首

魯忠王挽詞三首

故趙王屬贈黃門侍郎上官公挽詞

藥

奉和九日登慈恩寺浮圖應制

送沙門泓景道俊玄奘還荊州應制

春日芙蓉園侍宴應制

詠笛

詠鐘

花落

旅宿淮陽亭口號

內題賦得巫山雨

王昭君

銅雀台

巫山高

望月有懷

駕出長安

奉和晦日幸昆明池應制

奉和幸大薦福寺

奉和幸三會寺應制

奉和薦福寺應制

奉和幸神皋亭應制

奉和幸長安故城未央宮應制

奉和幸韋嗣立山莊侍宴應制

扈從登封告成頌應制

宴安樂公主宅得空字

春日鄭協律山亭陪宴餞鄭卿同用

和姚給事寓直之作

和庫部李員外秋夜寓直之作

酬李丹徒見贈之作

使過襄陽登鳳林寺閣

宋公宅送寧諫議

送合宮蘇明府頌

送楊六望赴金水

下桂江龍目灘

入瀧州江

始安秋日

桂州黃潭舜祠

登粵王台

早發始興江口至虛氏村作

發藤州

遊稱心寺

游法華寺

夜渡吳松江懷古

謁禹廟

游禹穴回出若邪

靈隱寺

遊雲門寺

早發韶州

早入清遠峽

發端州初入西江

渡漢江

嵩山夜還

湖中別鑾上人

題鑾上人房二首

答田征君

傷曹娘二首

河陽

燕巢軍幕

新年作

剪綵

七夕

桂州陪王都督晦日宴逍遙樓

詠省壁畫鶴

廣州朱長史座觀妓

謁二妃廟

贈嚴侍禦

在荊州重赴嶺南

則天皇后挽歌

鄧國太夫人挽歌

楊將軍挽歌

I. *Tangshi sanbaishou* 唐詩三百首

五言律詩

李隆基 經魯祭孔子而歎之

張九齡 望月懷遠

王灣 次北固山下

常建 破山寺後禪院

岑參 寄左省杜拾遺

李白 贈孟浩然

渡荆門送別

送友人

聽蜀僧濬彈琴

夜泊牛渚懷古

杜甫 春望

月夜

春宿左省

至德二載甫自京金光門出問道歸鳳翔乾元初從左拾遺移華州掾與親故別因

出此門有悲往事

月夜憶舍弟

天末懷李白

奉濟驛重送嚴公四韻

別房太尉墓

旅夜書懷

登岳陽樓

王維 輞川閒居贈裴秀才迪

山居秋暝

歸嵩山作

終南山

酬張少府

過香積寺

送梓州李使君

漢江臨眺

終南別業

孟浩然 臨洞庭上張丞相

與諸子登峴山

宴梅道士山房

歲暮歸南山

過故人莊

秦中寄遠上人

宿桐廬江寄廣陵舊遊

留別王維

早寒有懷

劉長卿 秋日登吳公臺上寺遠眺

送李中丞歸漢陽別業

錢別王十一南遊

尋南溪常道士

新年作

錢起 送僧歸日本

谷口書齋寄楊補闕

韋應物 淮上喜會梁州故人

賦得暮雨送李曹

韓翃 酬程近秋夜即事見贈

劉昫 闕題

戴叔倫 江鄉故人偶集客舍

盧綸 送李端

李益 喜見外弟又言別

司空曙 雲陽館與韓紳宿別

喜外弟盧綸見宿

賊平後送人北歸

劉禹錫 蜀先主廟

張籍 沒蕃故人

白居易 草

僧皎然 尋陸鴻漸不遇

五言絕句

王維 鹿柴

竹里館

送別

相思

雜詩

裴迪 送崔九

祖詠 終南望餘雪

孟浩然 宿建德江

春曉

李白 夜思

怨情

杜甫 八陣圖

王之渙 登鸛雀樓

劉長卿 送靈澈

彈琴

送上人

韋應物 秋夜寄丘員外

李端 聽箏

王建 新嫁娘

權德輿 玉臺體

柳宗元 江雪

元稹 行宮

白居易 問劉十九

張祜 何滿子

賈島 尋隱者不遇

西鄙人 哥舒歌