

## Chapter 3 *Jiuge* sub-grammar

### 3.1 General description of the raw corpus

The corpus for this chapter comprises of eleven poems of the *Jiuge* sub-genre, which belongs to the genre collectively referred to as *Chuci*. A description of the *Jiuge* poems first entails some background knowledge about the *Chuci* genre in general.

*Chuci*, literally meaning ‘Elegies of *Chu*’, was composed around the *Spring and Autumn* Period and the *Warring States* Period around 300 BC when China was divided into seven feudal states, all vying with one another for fief and power (Yang and Yang 1983). *Chu* was one of the seven states, and *Chuci* was believed to be mostly composed single-handedly by *Qu Yuan* (ca.340-278 BC), the greatest poet of this period as well as an under-appreciated court official of *Chu*, around the time when *Chu* was on the verge of being annexed by the more powerful state of *Qin*. *Chuci* is hailed as the origin of romanticism in Chinese literature in the sense that the poets sought to decry the decline of the country, criticize the impotence of the court, and express their frustration and forlornness by way of romantic allusions and religious allegories, rather than realistic depiction. Consequently, there is a religious theme in many *Chuci* poems, particularly the *Jiuge* ones, where shamanism is a prevailing theme. Furthermore, as *Chu* was located in what is nowadays the south-central part of China, *Chuci* is also known as ‘Poems of the South’.

The anthology of *Chuci* that has survived today consists of seventeen chapters, each constituting a unique sub-genre<sup>1</sup>. At the same time, the common features they share serve to collectively define the distinct genre known as *Chuci*. It is characterized by a unique integration of on the one hand, the distinct features of the *Chu* folk song, in particular, the wide use of the singing element ‘*xi*’, and on the other hand, the literary style of the northern states, which was mainly inherited from *Shijing* of the previous literary era. Nonetheless, the seventeen chapters differ in the degree in which they balance these two sources against each other and display variations on the basis of this overall refrain (Chen 1994). For example, *Tianwen* (‘Heavenly Questions’) and *Dazhao* (‘Great Summons’) are more heavily influenced by the *Shijing* tradition and feature more 4-syll lines and relatively few ‘*xi*’s whereas all the other fifteen chapters are unified by the pervasive use of ‘*xi*’. Furthermore, some chapters of the latter group, for example *Jiuge* (‘Nine Songs’) to be studied here, are characterized by the presence of ‘*xi*’ in every single line, whereas others, e.g. *Lisao* (‘On Encountering Trouble’) and *Yuanyou* (‘Far-off Journey’), have lines containing ‘*xi*’ interspersed with those bearing more resemblance with *Shijing* lines.

The omnipresence of ‘*xi*’, regarded as the hallmark of the *Chuci* genre, and the virtual absence of transitional lines of the *Shijing* type in *Jiuge* renders it a full-blown sub-genre as far as the representation of ‘*xi*’ is concerned, the distinct characteristic of *Chuci*. Indeed, *Jiuge* is also among the most popular *Chuci* verse for modern

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<sup>1</sup> For a full list of the titles and poems of the seventeen chapters, check out the website [faculty.virginia.edu/cll/chinese\\_literature/Chuci/Chucitoc.htm](http://faculty.virginia.edu/cll/chinese_literature/Chuci/Chucitoc.htm).

speakers. On this account, we opt to select it as the empirical basis for an exploration of the sub-grammar<sup>2</sup>.

With this background about the *Chuci* genre in general, we now move on to say a few words specifically about *Jiuge*. First, as is true with all *Chuci* chapters, *Jiuge* was intended to be mainly sung at its time of composition, though it was also argued to be recited back then; however, the tunes have long been lost and for modern speakers, the only viable manner for its delivery is recitation. Second, as mentioned earlier, every *Jiuge* line contains the interjection ‘*xi*’, and no other function words are used. Furthermore, ‘*xi*’ only occurs line-medially in *Jiuge*. In other words, every *Jiuge* line solely comprises of one (obligatorily present) line-medial ‘*xi*’ and a number of lexical syllables. Third, the *Jiuge* chapter contains altogether eleven poems, which are thematically concerned with different deities worshipped in the various parts of Chu. Fourth, the eleven poems display a considerable degree of variation: the number of lines contained in a poem ranges from 5 to 26, either belonging to one long stanza or grouped into several stanzas. The number of lines totals 253, and the overwhelming majority of them (250 out of 253) contain 5, 6 or 7 syllables. Admittedly, this corpus is much smaller than the *Shijing* corpus; nonetheless, it comprises of all *Jiuge* lines and as such offers a sufficient basis for the development of a robust scansion *Jiuge* sub-grammar.

## 3.2 Methodological issues and preview of the sub-grammar

### 3.2.1 Methodological issues

The organization of the chapter, and the notational convention are the same as those in the *Shijing* chapter (Section 2.2.1 of Chapter 2) and will not be repeated here. What differs between the *Shijing* chapter and this chapter in terms of methodology is that while the *Shijing* sub-grammar was developed from scratch, the *Jiuge* sub-grammar builds upon this sub-grammar. More specifically, in developing the *Shijing* sub-grammar, individual constraints and constraint rankings are motivated solely on the basis of the data; in developing the *Jiuge* sub-grammar, these constraints and rankings are, in principle, readily available and may be directly imported whenever applicable to the *Jiuge* data.

Obviously, this practice is enabled by the assumption outlined in Chapter 1 that there is *one and only one* overarching grammar for the modern speaker’s scansion of classical Chinese verse lines of all the five genres. At the same time, it was also mentioned there that this grammar is necessarily a partial ranking and the sub-grammars for different genres may well differ in their ranking. In view of this, we

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<sup>2</sup> Quite a few of the seventeen chapters are rather ill-known to modern speakers, largely due to the arcane, and in some cases, even obsolete diction used therein. Furthermore, some chapters, for example, *Qijian* (‘Seven Remonstrances’), are often featured by long lines with involved structures, which also thwarts its recitability and thus dampens its popularity with the modern speaker. On the other hand, to study the scansion sub-grammar for each of the seventeen sub-genres would be unfeasible for the current research which aims to cover the other four major genres of classical Chinese verse as well.

choose to adopt the relatively weak assumption in our analysis below, namely, that the sub-grammars only share constraints but not necessarily the ranking.

Translated into the specific analytical strategy, this assumption implies the following two points. First, the constraints motivated so far for the *Shijing* sub-grammar are part of the ‘constraint pool’ which contains all the constraints actively involved in the modern speaker’s scansion of classical Chinese verse lines<sup>3</sup>, and we will be freely drawing constraints from this pool in the analysis below. At the same time, it is well conceivable that the *Shijing* constraints do not constitute the whole constraint pool; new constraints motivated by data from other sub-genres will be added to it. Second, in accordance with the above-mentioned assumption, constraint ranking will primarily be motivated on the basis of the *Jiuge* data, although as we will see, the ranking already arrived at in the *Shijing* sub-grammar considerably expedites the analytical process<sup>4</sup>.

### 3.3 *Jiuge* sub-grammar

Of the 253 lines constituting the *Jiuge* corpus, except for one 8-syll line and two 9-syll lines, the remaining 250 lines range from 5- to 7-syllable long. As mentioned earlier, one of the most distinct features of the *Jiuge* genre is the omnipresence of ‘*xi*’; in terms of grammatical representation, we treat ‘*xi*’ as a stand-alone element. The organization of this section follows the same principle as that of Section 2.3 of the last chapter, namely, in the order of line length measured by syllable numbers.

#### 3.3.1 BINMAX, BINMIN and ANCHOR: evidence from 5-syll lines

All 5-syll *Jiuge* lines share the grammatical structure [SS]S[SS] (with the unbracketed middle syllable being ‘*xi*’) and the optimal scansion of (SS)(*xi*)(SS)<sup>5</sup>. For expository sake, in the following discussion, whenever necessary, we will directly present ‘*xi*’ in both input and output. Some examples are:

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<sup>3</sup> On a larger scale, this pool of constraints is in turn drawn from the repertoire of universal constraints shared by all human languages.

<sup>4</sup> In theory, we could also adopt the strong assumption that the sub-grammars share both the constraints and the ranking. However, in practice, this does not really simplify the analysis and exposition, as in many cases we need first to show the assumed ranking does not work for the current data, and then establish the new ranking. An additional reason for the adoption of the weak assumption and the concomitant analytical strategy laid out here is that we wish to be able to organize the following section in a way identical to that of Section 2.3 of Chapter 2, namely, by covering all line types (in terms of syllable numbers). This is in turn motivated by the desire to present the reader with not only an analytical process to reach the sub-grammar, but also a descriptive picture of the various lines for the current genre (including the ‘non-crucial’ lines that apparently contribute little to the development of the sub-grammar). We wish to emphasize notwithstanding that the choice between these two assumptions is essentially a stylistic matter and as such carries no theoretical significance. This weak assumption and the concomitant analytical strategy will also be adopted in the following chapters.

<sup>5</sup> It should be clarified that (SS)(S)(SS) is the optimal parsing for verse scansion, which, as argued in Footnote 11 of Chapter 2, disallows trisyllabic or polysyllabic feet. Indeed, (SSS)(SS) is an acceptable parsing for prose scansion, but crucially, in this parsing, the middle syllable of the trisyllabic foot has to be considerably reduced. The current study is only concerned with the grammar for verse scansion.

- (1) [ji2 ri4]xi1 [chen2 liang2] → (ji2 ri4)(xi1) (chen2 liang2)  
 good day xi morning fine  
 ‘Ah, such a good day and fine morning’.
- (2) [hu4 hu4] xi1 [qiu1 feng1] → (hu4 hu4)(xi1)(qiu1 feng1)  
 heavy/reduplication xi autumn wind  
 ‘Ah, how heavy the autumn wind is’.

To begin with, consider the potential candidate form (SSS)(SS), which, although acceptable in prose scansion, is nonetheless suboptimal in verse scansion. This exhibits exactly the same pattern as in the scansion of *Shijing* lines, where monosyllabic feet are conditionally acceptable but trisyllabic ones always banned. This invites the direct importing of the two binarity constraints BINMAX and BINMIN and their ranking BINMAX >> BINMIN from the constraint pool, which is illustrated as below:

(3)

[SS]xi[SS]	BINMAX	BINMIN
☞ (SS)(xi)(SS)		*
(SSxi)(SS)	*!	

Second, consider the potential but suboptimal candidate (S)(Sxi)(SS)<sup>6</sup>. Compare it against the input structure [SS]xi[SS], and it becomes apparent that ANCHOR from the constraint pool is able to winnow out this candidate by penalizing its poorer boundary matching between the grammatical and the prosodic structures than (SS)(xi)(SS).

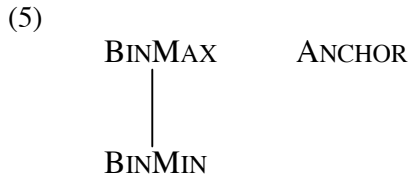
As to the ranking of ANCHOR with BINMAX and BINMIN, the current case provides no crucial argument; the reason is that the optimal winner, (SS)(xi)(SS), perfectly satisfies ANCHOR, while other suboptimal parsings, including (S)(Sxi)(SS), violate it in one way or another. Therefore, however ANCHOR is ranked, (SS)(xi)(SS) will always win, as illustrated below:

(4)

[SS]xi[SS]	BINMAX	BINMIN	ANCHOR-IO	ANCHOR-OI
☞ (SS)(xi)(SS)		*		
(S)(Sxi)(SS)		*	*	*
(SSxi)(SS)	*!		*	
(SS)(xiSS)	*!		*	

Thus the emerging sub-grammar developed solely on the basis of 5-syll lines is, in Hasse graph:

<sup>6</sup> Note that for some informants, (S)(SS)(SS) is also passable, but the consensus is that this scansion is ‘much less natural than (SS)(S)(SS)’. As befits our decision to address only one optimal candidate spelled out in Chapter 1, we treat (S)(SS)(SS) as sub-optimal.



Before we move on to 6-syll lines, the optimal scansion (SS)(xi)(SS) deserves further attention. Recall that *Shijing* has lines of the same structure [SS]S[SS], where the third syllable is an interjection. However, as shown in Section 2.3.4 of Chapter 2, such lines are best scanned as (S)(SS)(SS). For such *Shijing* lines, (SS)(S)(SS), which is the optimal scansion for *Jiuge* lines of the same structure, is suboptimal. The question now is what contributes to this difference. Apparently, these two lines belong to two different genres, but the real crux, we argue, lies in the fact that while the third syllable in the *Shijing* line is a normal interjection, the third syllable in the *Jiuge* line is ‘xi’, which is unique in many ways. With specific regard to the present case, the contrast between the parsing of 5-syll *Jiuge* lines and that of 5-syll *Shijing* lines of the same structure is attributable to the phonological property of ‘xi’, which is different from that of normal interjection syllables. Specifically, ‘xi’ can constitute a monosyllabic foot on its own whereas a normal interjection syllable can only serve as the weak syllable of a disyllabic foot. Indeed, as mentioned earlier, the omnipresence of ‘xi’ is one of the most distinct characteristics of the *Jiuge* sub-genre and in fact *Chuci* in general (Chen 1994), and it displays some unique phonological behaviors that call for a special treatment. However, since so far we have not demonstrated the full range of the phonological behavior of ‘xi’, we defer the discussion of ‘xi’ till a later point. For now, it is important to bear in mind that unlike normal interjection syllables, ‘xi’ can constitute a monosyllabic foot on its own.

### 3.3.2 ANCHOR-OI >> BINMIN >> ANCHOR-IO: evidence from 6-syll lines

6-syll lines constitute more than half of all *Jiuge* lines (128 out of 253); two grammatical structures are identified, namely, [[SS]S]xi[SS] and [S[SS]]xi[SS]. Lines of these two structures are respectively scanned as (SS)(Sxi)(SS) and (S)(SS)(xi)(SS). For example,

(6)      [[yu3 nv3] mu4] xi1 [xian2 chi2] → (yu3 nu3)(mu4 xi1)(xian2 chi2)  
           with you bathe xi place name  
           ‘Ah, (I) bathe with you in Xianchi’.

(7)      [ling2[huang2 huang2]] xi1[ji4 jiang4] → (ling2)(huang2huang2) xi1(ji4 jiang4)  
           spirit magnificent/redup. xi already descend  
           ‘Ah, the magnificent spirits have already descended (upon us)’.

(8)      [fu3 [chang2 jian4]] xi1 [yu4 er3] → (fu3)(chang2 jian4)(xi1)(yu4 er3)  
           stroke long sword xi jade ornament  
           ‘Ah, (I) stroke my long sword and (put on) my jade ornament’.

While the 5-syll lines provide no evidence for the ranking between BINMIN and ANCHOR, the scansion of lines of the structure  $[[SS]S]xi[SS]$  as  $(SS)(Sxi)(SS)$  offers crucial evidence for  $BINMIN \gg ANCHOR$ . The scansion  $(SS)(S)(xi)(SS)$  which fully conserves the input boundaries is suboptimal, due to its violations of BINMIN. The ranking argument is shown below:

(9)

$[[SS]S]xi[SS]$	BINMIN	ANCHOR-IO	ANCHOR-OI
☞ $(SS)(Sxi)(SS)$		*	
$(SS)(S)(xi)(SS)$	*!*		

Furthermore, since  $BINMAX \gg BINMIN$ , by transitivity, we have  $BINMAX \gg ANCHOR$ . Thus the sub-grammar now is  $BINMAX \gg BINMIN \gg ANCHOR$ .

However, this sub-grammar turns out insufficient to account for the scansion of lines of the structure  $[S[SS]]xi[SS]$ :  $(SS)(Sxi)(SS)$  would still win, while the real winner is  $(S)(SS)(xi)(SS)$ . This is illustrated below:

(10)

$[S[SS]]xi[SS]$	BINMAX	BINMIN	ANCHOR-IO	ANCHOR-OI
a. ☞ $(SS)(Sxi)(SS)$			**	*
b. ☞ $(S)(SS)(xi)(SS)$		*!*		
c. $(SSS)(xi)(SS)$	*!	*	*	

Under the current sub-grammar, the undesired winner (a) wins because of its maximal satisfaction of the highly ranked BINMAX and BINMIN, even though it violates ANCHOR. Indeed, as the sub-grammar stands now,  $(SS)(Sxi)(SS)$  is bound to emerge as the winner irrespective of the grammatical structure. The reason is that  $(SS)(Sxi)(SS)$ , by evenly chopping up the six syllables in the line into three disyllabic feet, always maximally satisfies the two high-ranking well-formedness constraints, BINMAX and BINMIN, even though this chopping violates ANCHOR by ignoring the input boundaries and freely inserting output ones<sup>7</sup>. By comparison, the desired winner  $(S)(SS)(xi)(SS)$ , whose boundaries fully match the input ones, loses because of the double violations of BINMIN.

The boundary matching between the input and output in the desired winner calls for a proper ranking of ANCHOR. Recall that in (9) only  $BINMIN \gg ANCHOR-IO$  was arrived at on the basis of crucial evidence, and we got  $BINMIN \gg ANCHOR-OI$  thereafter merely by assuming that the two ANCHOR constraints stay together in the hierarchy unless there is evidence to the contrary. Now, the scansion of lines of the structure  $[S[SS]]xi[SS]$  provides exactly such evidence to rank them apart;

<sup>7</sup> Evidently, in the so-called ‘minstrel’ performance style where the syntax and meaning of the verse line are ignored,  $(SS)(Sxi)(SS)$  would always win. But as mentioned in Chapter 1, such performance is linguistically uninteresting and not discussed in this study.

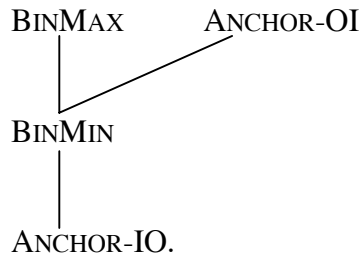
specifically, it constitutes the crucial ranking argument for ANCHOR-OI >> BINMIN, and by transitivity, ANCHOR-OI >> ANCHOR-IO. This is shown below:

(11)

[S[SS]]xi[SS]	ANCHOR-OI	BINMIN	ANCHOR-IO
(SS)(Sxi)(SS)	*!		**
☞(S)(SS)(xi)(SS)		**	

As to the ranking between ANCHOR-OI and BINMAX, there is yet no crucial evidence, as neither (SSS)(xi)(SS), which violates BINMAX, nor (SS)(Sxi)(SS), which violates ANCHOR-OI, wins. This shows that both BINMAX and ANCHOR-OI are highly ranked. Hence, the emergent sub-grammar is:

(12)



We close this section by drawing attention to a second type of well-formed feet containing ‘xi’ in addition to the monosyllabic foot (xi) mentioned at the end of Section 3.3.1, namely, (Sxi), which is the second foot in the optimal scansion for [[SS]S]xi[SS] illustrated in (9).

### 3.3.3 \*IP-FINAL-MONOFT and GOODFT’XI’: evidence from 7-syll lines

Compared with 5- and 6-syll ones, 7-syll lines exhibit more diverse patterns in both the grammatical structure and optimal scansion. Altogether six grammatical structures are identified: [[SS]S]xi[[SS]S], [[SS]S]xi[S[SS]], [SS]xi[S[S[SS]], [S[SS]]xi[[SS]S], [S[SS]]xi[S[SS]], and [S[S[SS]]xi[SS]. Lines of these diverse structures have four optimal scansions, i.e. (SS)(Sxi)(S)(SS), (SS)(xi)(SS)(SS), (S)(SS)(xi)(S)(SS) and (SS)(SS)(xi)(SS). Below we give examples for each of the six grammatical structures and their scansions.

(13) (i)

[[dong1 feng1] piao1] xi1 [[shen2 ling2]yu3]  
 east wind blow xi holy spirit rain  
 ‘Ah, the east wind blows and the holy spirit rains’

→ (dong1 feng1) (piao1 xi1) (shen2) (ling2 yu3)

- (ii) *[[yu3 nv3] you2] xi1 [he2 [zhi1 zhu4]]*  
 with you swim xi river 's shallows  
 'Ah, (I) swim with you in the shallows of the river'  
 → *(yu3 nv3) (you2 xi1) (he2) (zhi1 zhu4)*
- (iii) *[fu1 ren2] xi1 [zi4 [you3 [mei3 zi3]]]*  
 that person xi certainly have beautiful children  
 'Ah, that person certainly has beautiful children'  
 → *(fu1 ren2) (xi1) (zi4 you3) (mei3 zi3)*
- (iv) *[yao3 [ming2 ming2]]xi1[[yi3 dong1] xing2]*  
 far far/redup. xi towards east go  
 'Ah, (it is) so far away, and (I) will go eastwards'  
 → *(yao3) (ming2 ming2) (xi1) (yi3) (dong1 xing2)*
- (v) *[shi2 [lei3 lei3]] xi1 [ge3 [man4 man4]]*  
 rock big/redup. xi vine long/redup.  
 'Ah, how big the rocks are, and how long the vines are'  
 → *(shi2) (lei3 lei3) (xi1) (ge3) (man4 man4)*
- (vi) *[zhao1 [chi2 [yu2 ma3]]] xi1 [jiang1 gao3]*  
 morning ride my horse xi river side  
 'Ah, in the morning I ride my horse along the river'  
 → *(zhao1 chi2) (yu2 ma3) (xi1) (jiang1 gao3).*

As not all of the cases presented here are crucial in motivating new constraints or rankings, below we will first discuss those crucial ones to further develop the new sub-grammar and then illustrate the operation of this sub-grammar with some 'non-crucial' cases.

To begin with, so far there is yet no evidence for the ranking between BINMAX and ANCHOR-OI; the scansion of lines of the structure  $[[SS]S]xi[[SS]S]$  provides crucial evidence for BINMAX >> ANCHOR-OI. This is illustrated below:

(14)

$[[SS]S]xi[[SS]S]$	BINMAX	ANCHOR-OI
$(S)(SS)(Sxi)(S)(SS)$		*
$(SS)(Sxi)(SSS)$	*!	

Thus, the sub-grammar is now: BINMAX >> ANCHOR-OI >> BINMIN >> ANCHOR-IO. Now, consider lines of the structure  $[S[SS]]xi[[SS]S]$  and optimally parsed into  $(S)(SS)(xi)(S)(SS)$ , as shown in (13)(iv). The current sub-grammar fails to predict the correct winner:



(15)

[S[SS]]xi[[SS]S]	BINMAX	ANCHOR-OI	BINMIN	ANCHOR-IO
☞ (S)(SS)(xi)(S)(SS)		*!	***	*
(S)(SS)(xiS)(SS)		*!	*	**
☛ (S)(SS)(xi)(SS)(S)			***	
(SSS)(xi)(SS)(S)	*!		**	*

As the sub-grammar stands now, (S)(SS)(xi)(SS)(S) which better satisfies the highly ranked ANCHOR-OI, emerges as the winner. In contrast, the desired winner (S)(SS)(xi)(S)(SS) loses on account of violation of ANCHOR-OI. Now carefully compare this pair of competitors and it becomes apparent that the desired winner avoids an IP-final monosyllabic foot in order to satisfy some constraint that is presumably more important than ANCHOR-OI. For this purpose, \*IP-FINAL-MONOFT from the constraint pool readily presents itself and it has to dominate ANCHOR-OI, as the unwanted winner satisfies ANCHOR-OI but violates \*IP-FINAL-MONOFT. This is illustrated below:

(16)

[S[SS]]xi[[SS]S]	*IP-FINAL-MONOFT	ANCHOR-OI
☞ (S)(SS)(xi)(S)(SS)		*
(S)(SS)(xi)(SS)(S)	*!	

Second, as ANCHOR-OI >> BINMIN >> ANCHOR-IO, by transitivity, we have \*IP-FINAL-MONOFT >> BINMIN >> ANCHOR-IO. Third, \*IP-FINAL-MONOFT does not conflict with BINMAX: both are in fact inviolable as no potential parsings that violate either of them will survive, for example, (SS)(Sxi)(SS)(S) in violation of \*IP-FINAL-MONOFT and (SS)(Sxi)(SSS) in violation of BINMAX. Thus the emergent sub-grammar now is

(17) BINMAX, \*IP-FINAL-MONOFT >> ANCHOR-OI >> BINMIN >> ANCHOR-IO.

However, under this sub-grammar, (S)(SS)(xi)(S)(SS), the desired winner, still fails to win; this time it loses to (S)(SS)(xiS)(SS), which equally satisfies \*IP-FINAL-MONOFT, but incurs less violation of BINMIN. This is shown below:

(18)

[S[SS]]xi[[SS]S]	BINMAX	*IP-FINAL-MONOFT	ANCHOR-OI	BINMIN	ANCHOR-IO
☞ (S)(SS)(xi)(S)(SS)			*	***!	*
☛ (S)(SS)(xiS)(SS)			*	*	**

Evidently, in order for (S)(SS)(xi)(S)(SS) to win over (S)(SS)(xiS)(SS), some new constraint is needed that crucially cashes in on some difference between the two. A careful observation of the pair reveals that the suboptimal candidate contains a foot (xiS) with 'xi' at the first position while in the optimal candidate 'xi' occurs at the

second position in the foot (Sxi). Given that Chinese feet are trochaic (Section 2.3.2 of Chapter 2), this difference can be rephrased as ‘xi’ occurring in the head versus non-head position of a foot.

Clearly, the foot (xiS) is offensive in (S)(SS)(xiS)(SS) and this restricted parsing of ‘xi’ is reminiscent of that of normal interjection syllables discussed in Chapter 2; however, the constraint proposed there, i.e. GOODFTINTERJ cannot be directly imported. The reason is because the well-formedness pattern of feet containing (normal) interjections slightly yet crucially differs from that of feet containing ‘xi’. Specifically, a normal interjection syllable can only occur at the non-head, i.e. second position in a disyllabic foot but cannot constitute a monosyllabic foot on its own. In contrast, ‘xi’ can occur either as the non-head syllable in a disyllabic foot headed by a full syllable, or constitute a monosyllabic foot on its own (as was shown towards the end of Section 3.3.1). The only position where ‘xi’ cannot occur is the head position of a disyllabic foot. Therefore, we propose the constraint GOODFT’XI’ which is formulated as:

- (19) GOODFT’XI’  
 ‘Xi’ can only be legitimately parsed as the non-head of a disyllabic foot or as a monosyllabic foot on its own, but not as the head of a disyllabic foot.

The legitimate parsing pattern of ‘xi’ expressed by this constraint can be presented in table form as follows (where S stands for the full lexical syllable)<sup>8</sup>:

(20)

Foot type	Well-formedness
(Sxi)	Good
(xi)	Good
(xiS)	Bad

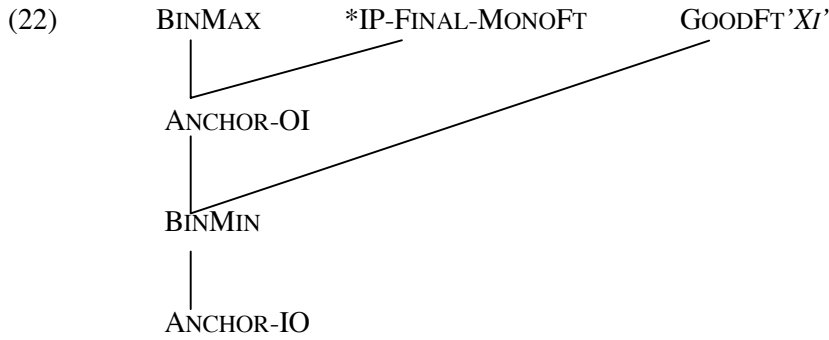
As for the ranking between GOODFT’XI’ and the other constraints, first, the two candidates in (18) provide the crucial ranking argument for GOODFT’XI’ >> BINMIN, illustrated as follows:

(21)

[S[SS]]xi[[SS]S]	GOODFT’XI’	BINMIN
☞ (S)(SS)(xi)(S)(SS)		***
(S)(SS)(xiS)(SS)	*!	*

Second, as we have argued for BINMIN >> ANCHOR-IO, by transitivity, we get GOODFT’XI’ >> ANCHOR-IO. Third, 6-syll *Jiuge* lines provide no crucial evidence for the ranking between GOODFT’XI’ and ANCHOR-OI. In fact, a careful consideration of all the line types in the *Jiuge* corpus reveals that none of them offers such crucial data. Thus the emergent sub-grammar now becomes:

<sup>8</sup> For the moment, we only present this parsing pattern for the purpose of developing the constraint without further explanation as to why the pattern is such; in the section below, we will argue that these patterns can be accounted for by the peculiar phonological property of ‘xi’.



To revisit lines of the structure [S[SS]]xi[[SS]S] in (15), we see that its optimal scansion can now be accounted for<sup>9</sup>:

(23)

[S[SS]]xi[[SS]S]	BINMAX	*IP-FINAL-MONOFT	GOODFT'XI'	ANCHOR-OI	BINMIN	ANCHOR-IO
☞ (S)(SS)(xi)(S)(SS)				*	***	*
(S)(SS)(xiS)(SS)			*!	*	*	**
(S)(SS)(xi)(SS)(S)		*!			***	
(SS)(xi)(S)(SS)	*!			*	**	**

This sub-grammar is also adequate to account for the scansion of 7-syll *Jiuge* lines of the other grammatical structures in the corpus. For space consideration, below we only illustrate the working of the sub-grammar with the grammatical structures [SS]xi[S[S[SS]]] ((13) (iii)), and [S[S[SS]]]xi[SS] ((13)(vi)):

(24)

[SS]xi[S[S[SS]]]	BINMAX	*IP-FINAL-MONOFT	GOODFT'XI'	ANCHOR-OI	BINMIN	ANCHOR-IO
☞ (SS)(xi)(SS)(SS)					*	*
(SS)(xiS)(S)(SS)			*!		*	*
(S)(Sxi)(SS)(SS)				*!	*	**
(SS)(xi)(S)(SSS)	*!				**	*

(25)

[S[S[SS]]]xi[SS]	BINMAX	*IP-FINAL-MONOFT	GOODFT'XI'	ANCHOR-OI	BINMIN	ANCHOR-IO
☞ (SS)(SS)(xi)(SS)					*	*
(S)(SSS)(xi)(SS)	*!				**	*
(SS)(SSxi)(SS)	*!					**
(SS)(SS)(xiS)(S)		*!	*	*	*	**

<sup>9</sup> Note that following our earlier practice, the arbitrary ranking GOODFT'XI' >> ANCHOR-OI is assigned to this non-ranking pair. One may of course assign the ranking ANCHOR-OI >> GOODFT'XI', which would yield the same optimal candidate.

### 3.3.3.1 The phonological representation of ‘xi’

In this section, we are going to argue that the well-formedness pattern for feet containing ‘xi’ presented in (20) and expressed in the form of the constraint GOODFT’XI’ is attributable to the unique phonological representation of ‘xi’.

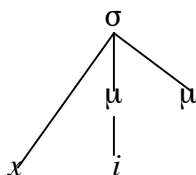
For this purpose, it is enlightening to compare the parsing of ‘xi’ with that of normal interjections. The most dramatic difference is that the former can legitimately constitute a monosyllabic foot whereas the latter cannot. This is shown clearly in the following table which presents, side by side, the parsing of ‘xi’ and normal interjection syllables (indicated as S<sub>I</sub>) as presented in Section 2.3.4 of Chapter 2.

(26)

Parsing of ‘xi’		Parsing of normal interjection syllables	
Foot type	Well-formedness	Foot type	Well-formedness
(Sxi)	good	(SS <sub>I</sub> )	good
(xi)	good	(S <sub>I</sub> )	bad
(xiS)	bad	(S <sub>I</sub> S)	bad

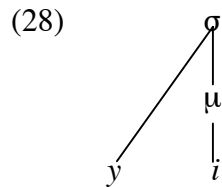
As shown above, this difference underlies the different scansions of lines between *Shijing* and *Jiuge* lines of the same structure. Superficially, the parsing pattern exhibited by ‘xi’ appears rather paradoxical: on the one hand, if ‘xi’ can constitute a monosyllabic foot, then it should be heavy; on the other hand, crucially it cannot occur as the head of a disyllabic trochee, which shows that it cannot really be heavy. We argue that the formal construct of empty mora offers a ready solution to this apparent dilemma: ‘xi’ has as its phonological representation an empty mora in addition to a filled mora whereas the normal interjection syllable is represented as a monomoraic structure where the mora is filled. Diagrammatically, the phonological representation of ‘xi’ is<sup>10</sup>:

(27)



<sup>10</sup> We assume that all moras, including the empty mora, are parsed into syllables; in other words, PARSE-μ is inviolable. This constraint stems from the general theory of prosodic licensing developed in Itô (1986) within the derivational framework and it requires that all phonological segments be prosodically licensed. Indeed, as a general constraint, PARSE could be understood as a constraint family requiring the prosodic licensing of phonological constructs at all levels of the prosodic structure; for example, PARSE-SYL which requires all syllables to be parsed into feet is another member of this family.

Compare this with the phonological representation of normal interjection syllables, for example, ‘yi’:



We argue that it is this empty mora in (27) that leads to the greater flexibility of ‘xi’ in its phonological parsing. Specifically, this underlying representation gives rise to two surface representations of ‘xi’ contingent on its position in the foot: (i) as bimoraic when occurring alone or at the second position of a disyllabic (and trochaic) foot, thus rendering these feet licit; (ii) as monomoraic when occurring at the first position of a disyllabic foot, thus rendering the foot illicit. Put differently, this underlying representation enables ‘xi’ to legitimately occur as either a monosyllabic foot or the non-head syllable of a disyllabic foot, but never as the head syllable of a disyllabic foot. Furthermore, we argue that these various surface realizations of ‘xi’ in different environments result from the interaction of several OT constraints. For clarity sake, below we refer to the constraint hierarchy responsible for the selection of the optimal surface realization of ‘xi’ as the ‘xi’-grammar’.

Given the postulated presence of an empty mora in the underlying representation of ‘xi’, to start the ball rolling, we need a constraint that demands the conservation of segment-to-mora linkage. McCarthy (2000: 159) proposes two universal faithfulness constraints NO-SPREAD and NO-DELINK which respectively militate against spreading and delinking of autosegmental associations. Specifically, NO-SPREAD requires that any association line that is present in the output have a correspondent in the input, and NO-DELINK requires that any association line present in the input have a correspondent in the output. As such they are respectively analogous to DEP (‘do not insert association lines’) and MAX (‘do not delete association lines’). These two constraints exert opposite influences and apply to each pair of associated autosegmental tiers, such as tone, place, mora and segment. Apparently, what is relevant here is the segment-to-mora association. Following McCarthy’s (Ibid.:159) formal notation, they are respectively as follows:

- (29) NO-SPREAD ( $\mu$ , SEG)<sup>11</sup>  
 Let  $S_1$  and  $S_2$  stand for two related phonological representations, where  
 $\mu_1$  and  $seg_1 \in S_1$ ,  
 $\mu_2$  and  $seg_2 \in S_2$ ,  
 $\mu_1 \mathbf{R} \mu_2$ , and  
 $seg_1 \mathbf{R} seg_2$ ,  
 if  $\mu_2$  is associated with  $seg_2$ ,

<sup>11</sup> Two points are worth mentioning here. First, as the mora and segment are the only autosegmental tiers involved here, below we will simply note this constraint as NO-SPREAD. Second, a similar pair of constraints FILLLINK (‘All association relations are part of the input’) and PARSELINK (‘All input association lines are kept’) are proposed in Ito, Mester and Padgett (1995:586) within the older Parse/Fill/Containment framework (Prince and Smolensky 1991, 1993).

then  $\mu_1$  is associated with  $\text{seg}_1$ .

- (30) NO-DELINK ( $\mu$ , SEG)  
 Let  $S_1$  and  $S_2$  stand for two related phonological representations, where  
 $\mu_1$  and  $\text{seg}_1 \in S_1$ ,  
 $\mu_2$  and  $\text{seg}_2 \in S_2$ ,  
 $\mu_1 \mathbf{R} \mu_2$ , and  
 $\text{seg}_1 \mathbf{R} \text{seg}_2$ ,  
 if  $\mu_1$  is associated with  $\text{seg}_1$ ,  
 then  $\mu_2$  is associated with  $\text{seg}_2$ .

In the current context, NO-SPREAD is tantamount to forbidding the association of the empty mora, unassociated with any segment in the input, with any phonological segment in the output, thus maintaining its ‘emptiness’. NO-DELINK, on the other hand, prevents any association lines present in the input from being deleted in the output. We assume that NO-DELINK is highly ranked in the ‘*xi*’-grammar and hence all input segment-to-mora linkages are preserved in the output; only NO-SPREAD is subject to interaction with other constraints, to be discussed below.

In addition, the presence of an empty mora in the syllable structure is highly marked, and a markedness constraint is in order that requires all moras to be linked with phonological segments in the output, thus explicitly banning the occurrence of any empty mora in the surface structure. We refer to it simply as NOEMPTYMORA, stated below:

- (31) NOEMPTYMORA:  
 A mora must be filled.

Before we proceed, one notational remark is in order. As we assume PARSE- $\mu$  is highly ranked and all moras are parsed into syllables, below for simplicity sake, (27) is simplified into

- (32) 
$$\begin{array}{cc} \mu & \mu \\ | & \\ i & \end{array}$$

where both the syllable node and the onset  $x$  are dropped.

As is evident from (26), ‘*xi*’ displays a unique flexibility in its parsing in that it assumes different surface forms depending on its phonological environment: (i) bimoraic when occurring alone, given the legitimacy of (xi); (ii) monomoraic when occurring at the first position of a disyllabic foot, given the illegitimacy of (xiS). When occurring at the second position in a disyllabic foot, it can in theory be either bimoraic or monomoraic<sup>12</sup>.

<sup>12</sup> This follows from the inventory of good and bad foot structures in Chinese presented in Chapter 2, and repeated here for convenience sake:

In terms of the preservation or deletion of the empty mora in the underlying representation, this pattern is tantamount to (i) when occurring alone, the underlying empty mora is preserved and filled in the surface representation; (ii) when preceding a full syllable in a disyllabic foot, this empty mora is deleted in the surface form and thus cannot head the disyllabic trochee. As for the scenario where ‘*xi*’ follows a full syllable in a disyllabic foot, a priori, no inference can be made regarding its surface structure, though as to be seen below in (42), ‘*xi*’ actually surfaces as bimoraic in this context.

This unique flexibility in the parsing of ‘*xi*’ is partially captured by the postulation of an empty mora in its underlying structure. Furthermore, certain constraints are needed to account for the surface appearance of this mora in some contexts and disappearance in others. On the one hand, the preservation of the underlying empty mora at least in some contexts calls for MAX- $\mu$ , a faithfulness constraint requiring all moras that are present in the input to be also present in the output, and this requirement is in force irrespective of whether the mora is empty or not. On the other hand, the underlying empty mora is not always preserved, but only when it is foot-final, as is evidenced from the licitness of (Sxi) and (xi) but illicitness of (xiS). That (xiS) is illicit suggests that the empty mora is deleted and ‘*xi*’ surfaces as a monomoraic syllable when foot-initial, thus resulting in a bad foot of the quantitative structure (LH).

This instructs us that by imposing a blanket requirement that all underlying moras should be preserved in the surface structure regardless of the environment in which the mora occurs, MAX- $\mu$  is too indiscriminating and needs to be supplemented by a ‘fine-tuning’ constraint that is responsible for the preservation of the underlying empty mora only in foot-final positions<sup>13</sup>. This latter constraint can be expressed as a position-specific version of MAX- $\mu$ , which is referred to as a ‘positional faithfulness constraint’ (Beckman 1997a, b). Specifically, it requires the preservation of the empty mora only when the syllable occurs foot-finally, and we represent it as MAX- $\mu$ ]<sub>F</sub>. The right bracket and the subscript F following the position-neutral MAX- $\mu$  indicates the foot-final environment in which MAX- $\mu$  operates<sup>14</sup>. Thus, we have two new constraints from the same family but of different granularity:

---

(i) Good foot structures in Chinese

x			x			x
(S	S)	or	(S	S)	or	(S)
( $\mu\mu$ )	( $\mu\mu$ )		( $\mu\mu$ )	( $\mu$ )		( $\mu\mu$ )
H	H		H	L		H

(ii) Bad foot structures in Chinese

x			x			x
(S	S)	or	(S	S)	or	(S)
( $\mu$ )	( $\mu$ )		( $\mu$ )	( $\mu\mu$ )		( $\mu$ )
L	L		L	H		L

<sup>13</sup> Note that in spite of its coarse granularity, MAX- $\mu$  is still indispensable and cannot be superseded by the position-specific version of MAX- $\mu$  altogether. Both need to be present in the constraint hierarchy and actually as is to be shown immediately below, the power of the analysis lies exactly in the ranking between the general constraint and the position-specific one as well as their ranking with the other two constraints introduced earlier.

<sup>14</sup> It needs to be pointed out that the proposal of the positional faithfulness constraint MAX- $\mu$ ]<sub>F</sub> bears on weighing between the two alternative views of ‘context markedness’ versus ‘positional faithfulness’ as discussed in Kager (1999:407ff), and the ‘positional faithfulness’ view is adopted here largely in view

(33) MAX- $\mu$   
A mora that is present in the input is present in the output.

(34) MAX- $\mu$ ]<sub>F</sub>  
A mora that occurs in a foot-final position in the input is present in the output.

Now that we have four constraints at our disposal, the next task is to rank them properly in order to account for the various phonological behaviors of ‘*xi*’, as presented in (26), which was rephrased in terms of the surface preservation or deletion of the underlying empty mora above.

To begin with, when forming a foot on its own, ‘*xi*’ is bimoraic where the empty mora is filled. This ban of the empty mora from the surface representation of ‘*xi*’ shows NOEMPTYMORA >> NO-SPREAD:

(35) (xi)

$\mu$ $\mu$   <i>i</i>	NOEMPTY MORA	NO- SPREAD
b. $\mu$ $\mu$   <i>i</i>	*!	
c. $\mu$ $\mu$ ↙    ↘ <i>i</i>		*

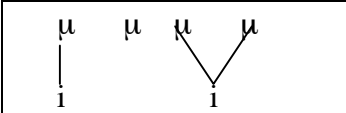
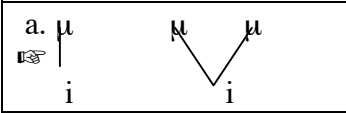
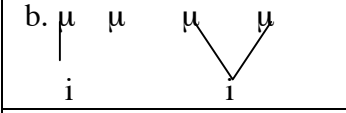
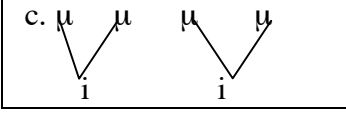
Second, that ‘*xi*’ surfaces as monomoraic in some cases but bimoraic in other cases calls for the deployment of two faithfulness constraints MAX- $\mu$  and MAX- $\mu$ ]<sub>F</sub>. For one thing, MAX- $\mu$  penalizes the deletion of any underlying mora, and the illegitimacy of \*(xiS) which testifies to the deletion of the underlying empty mora in this case, offers crucial evidence for NO-SPREAD >> MAX- $\mu$ , and by transitivity, NOEMPTYMORA >> MAX- $\mu$ . This is shown below:

---

of Kager’s (Ibid.) general arguments for it, although he also states there that ‘in most cases it is simply impossible to find evidence for one view or the other’ and that ‘in current literature both views have been adopted’ (see Kager (Ibid.) for details).



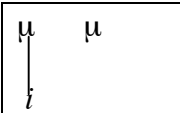
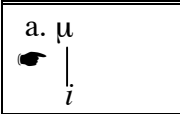
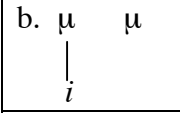
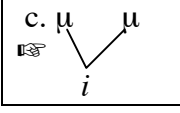
(36) \*(xiS)

	NOEMPTY MORA	NO-SPREAD	MAX-μ
a. 			*
b. 	*!		
c. 		*!	

A slight twist of mind is needed to interpret this tableau: candidate (a) is the optimal parsing in the sense that ‘xi’ in this position is optimally parsed as monomoraic, even though the foot is illegitimate; indeed, we know that ‘xi’ surfaces as monomoraic in this environment exactly because the foot with ‘xi’ at the head position followed by a full syllable is illegitimate, as it can only be of the (LH) structure.

However, although these three constraints ranked as such succeed in predicting the optimal parsing of ‘xi’ in the environment of (xiS), and in an indirect way, account for why (xiS) is illegitimate, they turn out to be inadequate for the two legitimate parsings of ‘xi’, namely, (xi) and (Sxi). Take the monosyllabic foot constituted by ‘xi’ as an example:

(37) (xi)

	NOEMPTY MORA	NO-SPREAD	MAX-μ
a. 			*
b. 	*!		
c. 		*!	

Compare the desired winner (candidate (c)) and the unwanted winner (candidate (a)): in the former the empty mora is deleted with only an inconsequential penalization due to the lowest ranking of MAX-μ. Clearly, some constraint is needed to preserve the empty mora on the part of the desired winner. At the same time, however, this preservation of the empty mora obviously has to be sensitive to the specific position of the mora because the empty mora cannot be preserved when it occurs at the first position of a foot as shown in (36). MAX-μ<sub>F</sub> exactly fits in this role by requiring the preservation of the mora only when it is foot-final.

The issue now is how to rank  $\text{MAX-}\mu]_{\text{F}}$ . First, the pair of candidates (a), the unwanted winner, and (c), the desired winner, provides crucial evidence for the ranking  $\text{MAX-}\mu]_{\text{F}} \gg \text{NO-SPREAD}$ : (a) violates  $\text{MAX-}\mu]_{\text{F}}$  but satisfies  $\text{NO-SPREAD}$  while (c) violates  $\text{NO-SPREAD}$  but satisfies  $\text{MAX-}\mu]_{\text{F}}$ . This is shown below:

(38)

$\begin{array}{c} \mu \quad \mu \\   \\ i \end{array}$	$\text{MAX-}\mu]_{\text{F}}$	$\text{NO-SPREAD}$
a. $\begin{array}{c} \mu \\   \\ i \end{array}$	*!	
c. $\begin{array}{c} \mu \quad \mu \\ \diagdown \quad / \\ i \end{array}$		*!

Second, because  $\text{NO-SPREAD} \gg \text{MAX-}\mu$ , by transitivity, we have  $\text{MAX-}\mu]_{\text{F}} \gg \text{MAX-}\mu$ . Third, there is no crucial evidence for the ranking between  $\text{MAX-}\mu]_{\text{F}}$  and  $\text{NOEMPTYMORA}$ , as candidate (b) satisfies  $\text{MAX-}\mu]_{\text{F}}$ , but does not outperform the desired winner (c) as it loses on account of its violation of  $\text{NOEMPTYMORA}$ .

Thus, the ‘*xi*’-grammar is now:

(39)  $\text{MAX-}\mu]_{\text{F}}, \text{NOEMPTYMORA} \gg \text{NO-SPREAD} \gg \text{MAX-}\mu$ <sup>15</sup>.

Under this constraint hierarchy, the parsing of ‘*xi*’ when it occurs alone is as follows (compare it with (37)):

(40) (xi)

$\begin{array}{c} \mu \quad \mu \\   \\ I \end{array}$	$\text{MAX-}\mu]_{\text{F}}$	$\text{NOEMPTYMORA}$	$\text{NO-SPREAD}$	$\text{MAX-}\mu$
a. $\begin{array}{c} \mu \\   \\ i \end{array}$	*!			*
b. $\begin{array}{c} \mu \quad \mu \\   \\ i \end{array}$		*!		
c. $\begin{array}{c} \mu \quad \mu \\ \diagdown \quad / \\ i \end{array}$			*	

Clearly the introduction of  $\text{MAX-}\mu]_{\text{F}}$  dramatically changes the picture and ‘*xi*’ surfaces as bimoraic, which accounts for why it can form a legitimate foot on its own.

<sup>15</sup> Presumably other constraints such as  $\text{DEP-}\mu$  are also involved to prevent the free insertion of moras and serve other basic ‘housekeeping’ purposes; however since they are not critical to the present discussion, we leave them out.

Furthermore, it does not affect the case of \*(xiS) analyzed earlier in (36), as the final syllable is a full bimoraic one and MAX-μ]<sub>F</sub> is vacuously satisfied by all candidates presented there. This is shown below:

(41) \*(xiS)

	MAX-μ] <sub>F</sub>	NOEMPTY MORA	NO-SPREAD	MAX-μ
<p>a.</p>				*
<p>b.</p>		*!		
<p>c.</p>			*!	

We now proceed to consider the parse of ‘xi’ in (Sxi) where the first syllable is a heavy, bimoraic one. As is shown by the tableau below, in this environment, ‘xi’ surfaces as bimoraic, and accordingly the foot has a quantitative structure of (HH), which is well-formed.

(42) (Sxi)

	MAX-μ] <sub>F</sub>	NOEMPTY MORA	NO-SPREAD	MAX-μ
<p>a.</p>			*	
<p>b.</p>	*!			*
<p>c.</p>		*!		

Thus we have shown that the seemingly perplexing and irregular phonological behavior of ‘xi’ can be satisfactorily accounted for by the postulation of an underlying

empty mora and the above ‘*xi*’-grammar which crucially makes use of the positional faithfulness constraint  $\text{MAX-}\mu]_{\text{F}}$ .

However, it needs to be realized that the well-formedness pattern of ‘*xi*’ presented in (26) is only concerned with the foot-level parsing. In fact, ‘*xi*’ is subject to further restrictions at higher levels of the prosodic structure, i.e. PhP and IP. Specifically, while (xi) is a legitimate foot, it cannot head a PhP or IP<sup>16</sup>. For example, the PhP-level parsing for the optimal scansion for [S[S[SS]]]xi[SS] in (25), i.e. (SS)(SS)(xi)(SS), is (SS)|(SS)(xi)(SS) rather than (SS)(SS)|(xi)(SS). This restriction is evidently insufficiently handled by the ‘*xi*’-grammar reached in (39). We propose that the inability of (xi) to head a PhP can be accounted for by the addition of yet another positional faithfulness constraint  $\text{NO-SPREAD}_{\text{PhP}}$  to the ‘*xi*’-grammar developed so far as the high-ranking one. Similar to  $\text{MAX-}\mu]_{\text{F}}$ , this constraint is a position-specific version of a more general faithfulness constraint, i.e.  $\text{NO-SPREAD}$ , and can be formulated as:

- (43)  $\text{NO-SPREAD}_{\text{PhP}}$   
Any association line of the PhP-initial segment that is present in the output have a correspondent in the input.

Or more formally as (cf. (29)):

- (44) Let  $S_1$  and  $S_2$  stand for two related phonological representations, where  
 $\mu_1$  and  $\text{seg}_1 \in S_1$ ,  
 $\mu_2$  and  $\text{seg}_2 \in S_2$ ,  
 $\mu_1 \mathbf{R} \mu_2$ , and  
 $\text{seg}_1 \mathbf{R} \text{seg}_2$ ,  
 if  $\mu_2$  is associated with  $\text{seg}_2$ , and  
 $\text{seg}_2$  is PhP-initial,  
 then  $\mu_1$  is associated with  $\text{seg}_1$ .

The ‘*xi*’-grammar is thus:

- (45)  $\text{NO-SPREAD}_{\text{PhP}}[ , \text{MAX-}\mu]_{\text{F}}, \text{NOEMPTYMORA} \gg \text{NO-SPREAD} \gg \text{MAX-}\mu$ .

Under this revised ‘*xi*’-grammar, the optimal form for a PhP initial ‘*xi*’ is the zero parse ( $\phi$ ), which refers to the non-surfacing of the underlying form (Kager 2000; referred to as ‘null parse’ in Prince and Smolensky 1993). In other words, (xi), albeit legitimate, can never occur PhP-initially. This is illustrated below (cf. (40)):

<sup>16</sup> Informally, one might suggest that the reason for this has something to do with the fact that although ‘*xi*’, when occurring alone, surfaces as bimoraic, this weight nonetheless results from the linking of the underlying empty mora to the segment *i*, and as such is ‘acquired’. This acquired weight is somewhat not as strong as the ‘innate’ weight of full lexical syllables which have two filled moras underlyingly. Furthermore, given the argument that prosodic units at all levels of the prosodic hierarchy of Chinese are trochaic, the PhP- and IP-initial positions are evidently very strong. Hence the monosyllabic foot (xi), with its ‘acquired’ weight from the empty mora, is somehow not as strong as the monosyllabic foot formed by a full lexical syllable, and as such cannot head a PhP or an IP.

(46)

	NO-SPREAD <sub>PhP[</sub>	MAX-μ] <sub>F</sub>	NOEMPTY MORA	NO-SPREAD	MAX-μ
a.		*!			*
b.			*!		
c.	*!			*	
d.					

Evidently, the addition of this new positional-specific NO-SPREAD<sub>PhP[</sub> only affects the parsing of PhP-initial ‘xi’ (including IP-initial one, of course) and has no bearing on the parsing of ‘xi’ elsewhere.

### 3.3.3.2 More discussion on the ‘xi’-grammar

The ‘xi’-grammar developed in (45) calls for more discussion. First, in retrospect, this grammar is configured in such a way that the two position-specific faithfulness constraints NO-SPREAD<sub>PhP[</sub> and MAX-μ]<sub>F</sub> respectively dominate their position-neutral counterparts NO-SPREAD and MAX-μ with the markedness constraint NOEMPTYMORA ‘sandwiched’ in between. This ranking scheme is compatible with the general pattern formulated in Kager (1999: 408):

(47) IO-Faithfulness (prominent positions) >> Markedness >> IO-Faithfulness (general)

which recurs in many OT grammars cross-linguistically, e.g. the grammar for Shona vowel harmony (Beckman 1997a) and that for the distribution of complex codas in Tamil (Beckman 1997b)<sup>17</sup>.

Second, compare the phonological representations of normal interjection syllables, ‘xi’ and normal lexical syllables, and we notice an intriguing pattern of moraicity gradience: in the above order, the representations are respectively one (filled) mora (as argued in section 2.3.4.1 of Chapter 2), one (filled) mora and an empty one, and two (filled) moras. In terms of syllable weight, this means that in Chinese, whereas normal lexical syllables are heavy and normal interjection syllables are light, ‘xi’ lies in between and may be suggested to be ‘semi-light’ (or ‘semi-heavy’ for that matter).

Third, a natural question is why ‘xi’ is so special with this extra bit of phonological weight. The reason is not completely clear at this moment, but we believe that it may well be, at least partly, traced back to its unique origin: on top of the features associated with interjections in general (such as semantically empty and emotionally laden), ‘xi’ is distinctly characterized by a significant singing element inherited from

<sup>17</sup> One might also suggest that the dominance of MAX-μ]<sub>F</sub> over MAX-μ exemplifies the ranking between two constraints in a Paninian relationship.

the folk song of the State of *Chu*. Indeed, some scholars have gone so far as to suggest that ‘*xi*’ is a linguistic unit specially reserved to simulate the drawl in singing (Legge 1871; Chen 1994) while others treat it as a mere ‘breather’ or ‘breathing sound’, which is an ‘otherwise meaningless sound that originally adapted the lyrics to the melody of the song’ (Field 1986). We suggest this musical element might furnish ‘*xi*’ with some additional weight, and renders it heavier than normal interjection syllables; however, this acquired weight is not so much as to elevate it on a par with full lexical syllables. As a consequence, it falls in between and cannot head a disyllabic foot. Furthermore, the monosyllabic foot (xi) is not strong enough to head higher-level prosodic units such as a PhP and an IP, as is a monosyllabic foot formulated by a full lexical syllable.

Fourth, as pointed out in Section 2.3.4.1 in Chapter 2, ‘*xi*’ also occurs in *Shijing*, but interestingly, there it exhibits no such uniqueness and behaves just like other interjection syllables. The noteworthy point is that modern speakers again are well aware of this subtle yet important difference and treat ‘*xi*’ in *Shijing* differently from in *Jiuge*, as is evidenced in their different scansion of lines containing ‘*xi*’<sup>18</sup>. We assume that ‘*xi*’s in *Shijing* and *Jiuge* are one and the same lexical entry in the modern speaker’s lexicon and share one underlying representation; the difference only lies in the ‘*xi*’-grammars respectively responsible for the surface representation of the *Shijing* ‘*xi*’ and the *Jiuge* ‘*xi*’. More specifically, we argue that the parsing pattern of the *Shijing* ‘*xi*’ results from the following ‘*xi*’-grammar operative for its surface realization<sup>19</sup>:

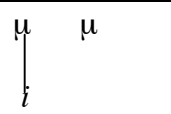
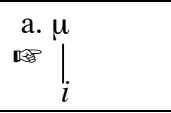
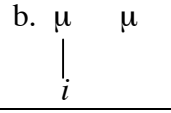
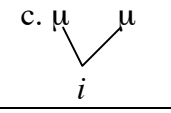
(48) NOEMPTYMORA, NO-SPREAD >> MAX-μ

Compare this to the ‘*xi*’-grammar for the *Jiuge* ‘*xi*’ in (45), and it is notable that the positional faithfulness constraints NO-SPREAD<sub>PhP</sub>[ and MAX-μ]<sub>F</sub> are not operative for the *Shijing* ‘*xi*’. As a result, the *Shijing* ‘*xi*’ always surfaces as monomoraic, lacking the position sensitivity characterizing the parsing of *Jiuge* ‘*xi*’. Consequently it can only serve as the non-head of a disyllabic trochee, as shown below:

<sup>18</sup> Indeed, ‘*xi*’ is also present in a handful of earlier poems of *Guti*, the genre following *Chuci*. And interestingly there, the modern speaker also treats it merely as a normal interjection syllable and parses it accordingly (see Chapter 4). In other words, *Chuci* is the only genre where ‘*xi*’ acquires this extra bit of phonological weight; once out of this genre, it is deprived of this phonological privilege and ‘back to normal’. Needless to say, that the modern speaker is able to treat the same lexical item ‘*xi*’ differently when it occurs in different genres crucially rests upon the fact that she is able to tell which genre a given line is of, largely thanks to the distinct characteristics associated with each genre.

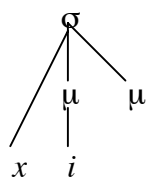
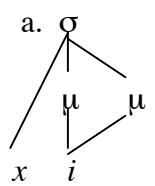
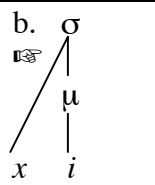
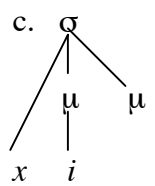
<sup>19</sup> As the development of this side-grammar is similar to (though considerably less complicated than) that of the side-grammar for the *Jiuge* ‘*xi*’, it is not belabored here.

(49) Surface realization of the *Shijing* 'xi'

	NOEMPTY MORA	NO-SPREAD	MAX-μ
a. 			*
b. 	*!		
c. 		*!	

Fifth, so far we have dealt with three types of feet containing 'xi': (Sxi), (xi) and (xiS), the former two being legitimate whereas the latter illegitimate. In view of the weight scalarity mentioned above, we might wonder about the well-formedness of feet comprised of 'xi' and a normal interjection syllable. Still using S<sub>I</sub> to stand for the interjection syllable, what is at issue here is the legitimacy of (xiS<sub>I</sub>) and (S<sub>I</sub>xi). Neither of these combinations are present in our corpus, and we suggest that this absence is principled: both turn out to be ill-formed under the 'xi'-grammar developed above, as shown below (the normal interjection syllable is exemplified with the interjection 'yi'):

(50) \*(xiS<sub>I</sub>)

	NO-SPREAD <sub>PhP</sub>	MAX-μ] <sub>F</sub>	NOEMPTY MORA	NO-SPREAD	MAX-μ
a. 				*!	
b. 					*
c. 			*!		

(51)  $*(S_{IXI})$ 

	NO-SPREAD <sub>PhP</sub> [	MAX- $\mu$ ] <sub>F</sub>	NOEMPTYMORA	NO-SPREAD	MAX- $\mu$
a.				*	
b.		*!			*
c.			*!		

In these two cases, the feet resulting from the surface realization of ‘*xi*’ respectively have the quantitative structure of (LL) and (LH), and hence are illicit.

Sixth, it is important to point out that similar to the constraint GOODFT<sub>INTERJ</sub> proposed in the *Shijing* sub-grammar, GOODFT<sub>XI</sub> is, in theory, also reformulable in terms of more universal constraints; GOODFT<sub>XI</sub> is used as a portmanteau constraint merely for convenience sake to tuck away the constraints into which it can be decomposed. Specifically, now that we have argued for the phonological representation of ‘*xi*’ as a filled mora plus an empty one, what is encapsulated in GOODFT<sub>XI</sub> is, on the one hand, the ‘*xi*’-grammar argued for here (which yields the optimal surface forms of ‘*xi*’), and on the other hand, the two bedrock constraints for good and bad foot structures in Chinese, namely, RHTYPE=TROCHEE and STRESS-TO-WEIGHT (which checks the well-formedness of the foot containing ‘*xi*’; see Section 2.3.4.1 of Chapter 2). All the four constraints in the sub-grammar, i.e., MAX- $\mu$ ]<sub>F</sub>, NOEMPTYMORA, NO-SPREAD and MAX- $\mu$ , as well as the latter two constraints, are all universal ones well-attested cross-linguistically; in addition, as shown in (47), the ranking among the four constraints constituting the ‘*xi*’-grammar also follows a general pattern of interaction that holds across languages between positional faithfulness constraints, markedness ones, and general faithfulness ones.

Seventh, it needs to be realized that this ‘*xi*’-grammar is actually ‘the grammar behind GOODFT<sub>XI</sub>’, and GOODFT<sub>XI</sub> effectively encapsulates it. Expositorily, similar to the treatment of the sub-hierarchy for the delimitation of the PhP boundary in Chapter 2, the ‘*xi*’-grammar is also ‘folded away’ in the constraint GOODFT<sub>XI</sub> in the sub-



grammar. Indeed, in the sense that the phonological parsing of the verse line containing ‘*xi*’ must conform to the well-formedness of feet containing ‘*xi*’ rather than the other way around, we might argue that this ‘*xi*’-grammar, if integrated into the sub-grammar, must be high-ranking, which is reflected in the high-ranking of GOODFT’*XI*’.

Finally, let us reconsider the optimal parsing in (25). That the PhP-level parsing is (SS)l(SS)(xi)(SS) rather than (SS)(SS)l(xi)(SS) offers crucial evidence for the dominance of the sub-hierarchy for PhP boundary delimitation, i.e. BINARITY >> EVENNESS >> LONG-LAST, by the sub-grammar responsible for foot-level parsing, where the ‘*xi*’-grammar is encapsulated in the inviolable GOODFT’*XI*’<sup>20</sup>. This is shown below. For simplicity sake, we only show the different PhP parsing of the same foot parsing (SS)(SS)(xi)(SS).

(52)

	Foot-level parsing hierarchy					PhP-level parsing hierarchy			
[S[S[SS]]]xi[SS]	BINMAX	*IP-FINAL-MONOFT	GOODFT’ <i>XI</i> ’	ANCHOR-OI	BINMIN	ANCHOR-IO	BINARITY	EVENNESS	LONG-LAST
☞ (SS)l(SS)(xi)(SS)					*	*	**	***	
(SS)(SS)l(xi)(SS)			*!		*	*		*	
(SS)(SS)(xi)l(SS)					*	*	**	***	*!

Evidently, if the PhP-level parsing hierarchy dominated the foot-level parsing hierarchy, (SS)(SS)l(xi)(SS) would have won.

### 3.3.4 8-syll lines and 9-syll lines

The above discussion on the phonological representation of ‘*xi*’ is triggered by the parsing of ‘*xi*’ exhibited in the scansion of 5-, 6- and 7-syll *Jiuge* lines. The sub-grammar developed so far, as presented in (22), is represented in a linear form as:

(53)

BINMAX, \*IP-FINAL-MONOFT, GOODFT’*XI*’ >> ANCHOR-OI >> BINMIN >> ANCHOR-IO.

As stated earlier, 5-, 6- and 7-syll lines comprise the bulk of the present corpus; still, there remain one 8-syll line and two 9-syll lines in the corpus to be analysed. As is shown below, their scansions can all be adequately handled by the sub-grammar just presented.

#### 3.3.4.1 8-syll lines

The single 8-syll line is of the grammatical structure [S[SS]]xi[[SS][SS]] and optimally scanned as (S)(SS)(xi)(SS)(SS). This is presented below:

<sup>20</sup> This argument is based on the assumption that constraints in each of these two hierarchies cluster together and do not intermingle.

- (54) *[nv3 [chan2 yuan3]] xi1 [[wei4 yu2] [tai4 xi1]]*  
 you beautiful graceful xi for me deep sigh  
 ‘Ah, the beautiful and graceful you are sighing deeply for me’.

→ *(nv3) (chan2yuan3) (xi1) (wei4 yu2) (tai4 xi1)*

The sub-grammar correctly predicts (S)(SS)(xi)(SS)(SS) as the optimal scansion<sup>21</sup>:

(55)

[S[SS]]xi[[SS][SS]]	BINMAX	*IP-FINAL-MONOF <sub>T</sub>	GOOD FT'X <sub>I</sub> '	ANCHOR-OI	BINMIN	ANCHOR-IO
a. ㄟ (S)(SS)(xi)(SS)(SS)					**	
b. (SS)(Sxi)(SS)(SS)				*!		**
c. (SSS)(xi)(SS)(SS)	*!				*	*
d. (S)(SSxi)(SS)(SS)	*!				*	*
e. (SS)(S)(xi)(SS)(SS)				*!	**	*
f. (S)(SS)(xiS)(S)(SS)			*!	*	**	*

### 3.3.4.2 9-syll lines

Two 9-syll lines appear in our corpus, which are respectively structured as [S[SS]]xi[[SS][S[SS]]] and [S[S[SS]]]xi[S[S[SS]]], and optimally scanned as (S)(SS)(xi)(SS)(S)(SS) and (SS)(SS)(xi)(SS)(SS). The two lines are given below:

- (56) *[qi1 [bu2 xin4]] xi1 [gao4 yu2] [yi3 [bu4 xian2]]*  
 promise not keep xi accuse me because not leisure  
 ‘Ah, the promise is not kept and I was accused of not being leisurely’

→ *(qi1) (bu2 xin4) (xi) (gao4 yu2) (yi3) (bu4 xian2)*

- (57) *[yu2 [chu3[you1 huang2]]] xi1 [zhong1 [bu2 [jian4tian1]]]*  
 I stay gloomy bamboo xi ever no see sky  
 ‘Ah, I stay in the gloomy bamboo forest, and never see the sky’

→ *(yu2 chu3) (you1 huang2) (xi) (zhong bu) (jian tian).*

Again both optimal scansions are well predicted by the sub-grammar, as shown below:

<sup>21</sup> Note that candidate (d) has a trisyllabic foot containing ‘xi’ that needs to undergo evaluation by GOODFT’X<sub>I</sub>'. So far we have been solely concerned with the well-formedness pattern of monosyllabic or disyllabic feet containing ‘xi’. The sub-grammar leads ‘xi’ to surface as a bimoraic syllable in this context of (SSxi) (the tableau is omitted here, similar to (40)). Thus, the trisyllabic foot has a quantitative structure of (HHH), which is well-formed when trisyllabic feet are allowed, i.e. in prose scansion.

(58)

[S[SS]]xi[[SS][S[SS]]]	BINMAX	*IP-FINAL-MONOFT	GOOD Ft'Xl'	ANCHOR-OI	BINMIN	ANCHOR-IO
a. $\text{S}(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$					***	
b. $(\text{S})(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$				*!	*	**
c. $(\text{S})(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$	*!				**	*
d. $(\text{S})(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$	*!				**	*
e. $(\text{S})(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$	*!		*		**	*
f. $(\text{S})(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$			*!	*	*	**
h. $(\text{S})(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$		*!		*	***	*

(59)

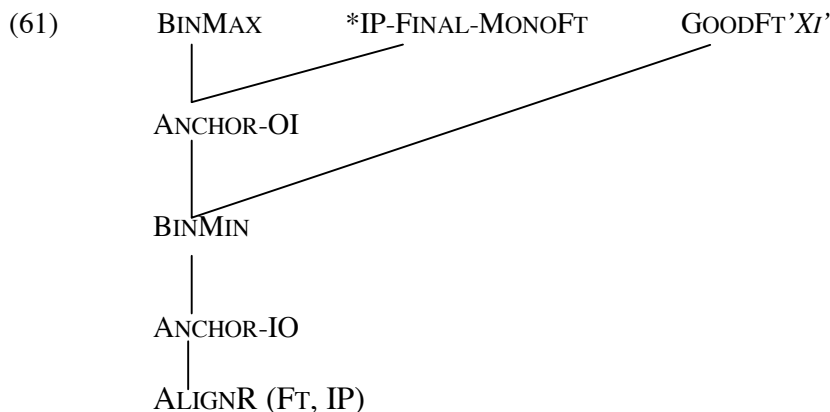
[S[S[SS]]]xi[S[S[SS]]]	BINMAX	*IP-FINAL-MONOFT	GOOD Ft'Xl'	ANCHOR-OI	BINMIN	ANCHOR-IO
a. $\text{S}(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$					*	**
b. $(\text{S})(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$					**!*	*
c. $(\text{S})(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$	*!*				***	**
d. $(\text{S})(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$			*!		*	**
e. $(\text{S})(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$				*!	*	***
f. $(\text{S})(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})(\text{S})(\text{S})$					**!*	*

Thus, the sub-grammar developed so far is adequate to account for the modern speaker's scansion of all *Jiuge* lines. It needs to be pointed out here that although ALIGNR (FT, IP) apparently has no bearing on the scansion, it must be dominated by ANCHOR-IO which so far ranks the lowest:

(60)

[S[SS]]xi[SS]	ANCHOR-IO	ALIGNR (FT, IP)
$\text{S}(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})$		10
$(\text{S})(\text{S})(\text{x})(\text{S})(\text{S})$	*!*	6

Indeed, that ALIGNR (FT, IP) plays no active role in selecting the winner is exactly because of its ranking as such<sup>22</sup>. Thus, with this new addition, the grammar is:



<sup>22</sup> For a fully articulated definition of the notion of '(in)active', see Prince and Smolensky (1993: 107).

For simplicity sake, ALIGNR (FT, IP) has been omitted in the tableaux so far due to its inactiveness, but as we will see below, it does become crucial in accounting for the metrical harmony judgment.

### 3.4 Formal grounding of metrical harmony

Similar to the organization of Chapter 2, this section is devoted to a formal account of the metrical harmony. We are going to argue that as in the case of the *Shijing* lines, the modern speaker's metrical harmony judgment of *Jiuge* lines can be formally grounded in the *Jiuge* sub-grammar. The analytical procedure is identical with that in Section 2.4 of Chapter 2 and will not be repeated here. Furthermore, 8- and 9-syll lines will be omitted due to their negligible percentage (respectively 1 and 2 out of 253 lines) and only 5-, 6- and 7-syll lines will be examined below.

To begin with, as mentioned in Section 3.3.1, all the 5-syll *Jiuge* lines have the same grammatical structure [SS]xi[SS] and scansion (SS)(xi)(SS). Apparently, the tableau des tableaux would consist of only one candidate parse, which is trivially the optimal one. At the same time, there is converging native judgment on the metrical harmony of such 5-syll lines: they are all experienced to be metrically very harmonious. Thus, in this case, the metrical harmony can be trivially grounded in the sub-grammar<sup>23</sup>.

Alternatively, we can show the formal grounding of the metrical harmony judgment in the grammar as the OT harmony by constructing some hypothetical grammatical structures and then elicit the native metrical harmony judgment on the one hand, and examine the formal harmony on the other. For example, consider the constructed line of the grammatical structure [S]xi[S[SS]] in imitation of line (13) (iii) above:

- (62)        [ren2] xi1 [you3 [mei3      zi3]]  
               person xi have beautiful children  
               'The person has beautiful children'

for which I elicited from my informants the optimal scansion (*ren2 xi1*) (*you3*) (*mei3 zi3*) and the judgment that it is 'not as harmonious as [SS]xi[SS]). The following tableau des tableaux is therefore constructed<sup>24</sup>:

(63)

Candidate parses	BIN MAX	*IP- FINAL- MONOFT	GOODFT' XI'	ANCHOR- OI	BIN MIN	ANCHOR- IO	ALIGNR (FT, IP)
a. $\left\{ \begin{array}{l} [SS]xi[SS] \\ (SS)(xi)(SS) \end{array} \right.$					*		5
b. $\left\{ \begin{array}{l} [S]xi[S[SS]] \\ (Sxi)(S)(SS) \end{array} \right.$					*	*!	5

<sup>23</sup> The interesting question to pursue here is why 5-syll *Jiuge* lines in the corpus only exhibit this grammatical structure, and all the other grammatical structures fail to appear. Evidently, this question necessarily brings us to look into the ancient side of the picture. As is to be argued in Zuo (in preparation), this is because the ancient verse grammar entertained by the ancient poet encourages the maximal mapping of the boundaries between the grammatical and the prosodic structures. Indeed, compared with other line types where the grammatical structures serving as the input of the sub-optimal parses merely occur with a low frequency, the 5-syll *Jiuge* lines might be considered an extreme case where the grammatical structures in the sub-optimal parses occur with a zero frequency.

<sup>24</sup> Note that ALIGNR (FT, IP) is included in the tableaux des tableaux in this section.

This indeed reveals that the parse corresponding to the grammatical structure that actually occurs in the corpus best satisfies the constraints and as such has the most OT harmony. Actually, it is as good as a 5-syll line can be in that it incurs the ‘minimal violation’ of BINMIN, which is inevitable given that the line contains an odd number of syllables. In contrast, the parse corresponding to the constructed grammatical structure is suboptimal.

Now consider 6-syll lines. As mentioned in Section 3.3.2, there are two grammatical structures, i.e. [[SS]S]xi[SS] and [S[SS]]xi[SS], corresponding to two parses. Given their respective optimal scansions being (SS)(Sxi)(SS) and (S)(SS)(xi)(SS), the tableau des tableaux is constructed below:

(64)

Candidate parses	BIN MAX	*IP- FINAL- MONOFT	GOODFT' XI'	ANCHOR- OI	BIN MIN	ANCHOR- IO	ALIGNR (FT, IP)
a. $\left\{ \begin{array}{l} [[SS]S]xi[SS] \\ (SS)(Sxi)(SS) \end{array} \right.$						*	5
b. $\left\{ \begin{array}{l} [S[SS]]xi[SS] \\ (S)(SS)(xi)(SS) \end{array} \right.$					*!*		5

Of the two grammatical structures, lines of the [[SS]S]xi[SS] are felt to be metrically more harmonious by the native speaker. As shown here, the parse corresponding to this grammatical structure is optimal under the *Jiuge* sub-grammar. Thus, again the metrical harmony can be formally grounded in the sub-grammar via the construct of OT harmony.

For 7-syll *Jiuge* lines, six grammatical structures occur in the corpus, which give rise to six candidate parses, and given the optimal scansion by the ancient speaker for lines of each grammatical structure, the tableau des tableaux is constructed below:

(65)

Candidate parses	BIN MAX	*IP- FINAL- MONOFT	GOOD FT'XI'	ANCHOR -OI	BINMIN	ANCHOR -IO	ALIGNR (FT, IP)
a. $\left\{ \begin{array}{l} [[SS]S]xi[[SS]S] \\ (SS)(Sxi)(S)(SS) \end{array} \right.$				*!	*	**	10
b. $\left\{ \begin{array}{l} [[SS]S]xi[S[SS]] \\ (SS)(Sxi)(S)(SS) \end{array} \right.$					*	*	10
c. $\left\{ \begin{array}{l} [SS]xi[S[S[SS]]] \\ (SS)(xi)(SS)(SS) \end{array} \right.$					*	*	11!
d. $\left\{ \begin{array}{l} [S[SS]]xi[[SS]S] \\ (S)(SS)(xi)(S)(SS) \end{array} \right.$				*!	*	*	15
e. $\left\{ \begin{array}{l} [S[SS]]xi[S[SS]] \\ (S)(SS)(xi)(S)(SS) \end{array} \right.$					*!*!		15
f. $\left\{ \begin{array}{l} [S[S[SS]]]xi[SS] \\ (SS)(SS)(xi)(SS) \end{array} \right.$					*	*	10

The sub-grammar yields two equi-optimal parses (b) and (f), when the fact of the matter is that only the input structure of the parse (b), i.e. [[SS]S]xi[S[SS]] is cognized by the modern speaker as the most harmonious. It is notable that ALIGNR (FT, IP), hitherto inactive, becomes crucial in sifting parse (c) out. To discriminate (f)

from (a) presents a similar scenario to the case of 6-syll *Shijing* lines (cf. (95) and (96) in Chapter 2) where parse (f), with its PhP boundary after the first foot, can be winnowed out by the PhP boundary delimitation sub-hierarchy BINARITY >> EVENNESS >> LONG-LAST.

(66)

Candidate parses	BINARITY	EVENNESS	LONG-LAST
b. 𠄎 { [[SS]S]xi[S[SS]] (SS)(Sxi)(S)(SS)		*	
f. { [S[S[SS]]]xi[SS] (SS)(SS)(xi)(SS)	*!*	***	

This way, parse (b) emerges as the only winner, which coincides with the modern speaker's metrical harmony judgment. This is illustrated below. As argued in (52), the PhP boundary delimitation hierarchy ranks lower than the foot-level parsing hierarchy.

(67)

Candidate parses	BINMAX	*IP-FINAL-MONOFt	GOODFt'X'	ANCHOR-OI	BINMIN	ANCHOR-IO	ALIGNR (Ft, IP)	BINARITY	EVENNESS	LONG-LAST
b. 𠄎 { [[SS]S]xi[S[SS]] (SS)(Sxi)(S)(SS)					*	*	10		*	
c. { [SS]xi[S[S[SS]]] (SS)(xi)(SS)(SS)					*	*	11!		*	
f. { [S[S[SS]]]xi[SS] (SS)(SS)(xi)(SS)					*	*	10	*!*	***	

To conclude, the metrical harmony judgment for the *Jiuge* lines can be formally grounded in the corresponding sub-grammar, which necessarily includes both the foot-level and PhP-level parsing hierarchies.