A METRICAL GRID ANALYSIS OF CHINESE REGULATED VERSE

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Prince 1983 and Selkirk 1984 argue that hierarchical prosodic constituents, as in metrical trees, should be excluded from metrical theory. Recent analyses of Chinese regulated verse use trees (Chen 1979, Yip 1980, Xue 1989). However, a grid analysis is superior to tree analyses, which supports the contention of Prince and Selkirk.

I present Chen's analysis in detail, since much of his analysis remains unchanged in Yip and Xue. Then I present Yip's and Xue's modifications to tone labeling of nodes in the metrical tree. Finally, I present a grid analysis.

1. Chen's analysis. Chen gives the following tonal schemes for Chinese regulated verse.

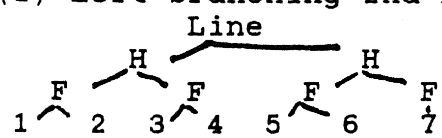
(1)

Heptasyllabic A		Pentasyllabic A
1. v v - - - v v	First Quatrain	1. - - - v v
2. - - v v v - -		2. v v v - -
3. - - v v - - v		3. v v - - v
4. v v - - v v -		4. - - v v -
Heptasyllabic B		**Pentasyllabic B**
1. - - v v - - v	First Quatrain	1. v v - - v
2. v v - - v v -		2. - - v v -
3. v v - - - v v		3. - - - v v
4. - - v v v - -		4. v v v - -

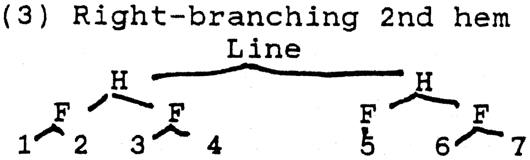
("v" symbolizes an oblique tone, which has a rising and/or falling contour. "-" symbolizes an even tone, which has a steady-state pitch throughout the syllable.) Chen notes two facts that must be accounted for: the second quatrain is identical to the first (and for this reason I have given only the first in 1 above), and P(entasyllabic) verse is identical to the last five positions in the corresponding H(eptasyllabic) verse.

Chen proposes a tree analysis. First, consider H verse. If the line consists of two hemistichs (hereafter "hems") containing two feet, and one of the two feet of the second hem contains only one position, whereas all other feet contain two positions, we will come up with two trees:

(2) Left-branching 2nd hem



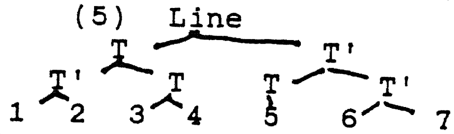
(3) Right-branching 2nd hem

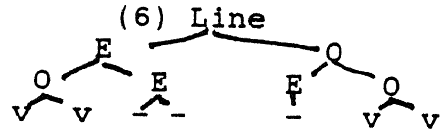


Now let us look at the right-branching (R) structure, letting all sister constituents down to the level of the metrical foot have opposite tones assigned to them like so:

(4) T ---> T' T and T' ---> T T'

Here T' = the opposite tonal specification from T. Let us start with the first hem being marked T, as in 5:

(5) 

(6) 

In 6 we see the tone labeled tree if T = E(ven), and T' = O(blique). 6 is, in fact, the pattern we find for 1,HA (to be read "line 1 of Heptasyllabic A verse"). If, instead, we let T = O, then T' = E. The tree with tone specified will be have precisely the opposite labels on all nodes, with the terminal string:

(7) - - v v v - -

This is, in fact, the pattern we find for 2,HA.

On the other hand, if we look at the left-branching (L) structure in 2 and fill in our Ts and T's, and if we set T = E, we find the following outcome:

(8) v v - - - - v

And if we set T = O, we find:

(9) - - v v v v -

Neither of these two patterns are found in verse, however. Chen accounts for this with his T(onotactic) condition:

(10) Tonotactic Condition: If Tone Assignment produces four consecutive syllables carrying an identical tone, the tones of the second half-line undergo alpha-switching (E to O, and vice-versa).

10 applies always and only to an L structure, as the reader can easily verify. It converts 8 to:

(11) v v - - v v -

And the T-condition will convert 9 into:

(12) - - v v - - v

But now we see that 12 is, in fact, the pattern we find for 3,HA and 11 is the pattern we find for 4,HA.

Let me summarize the findings thus far. There are two parameters: whether a structure is R or L and whether we set T to equal E or O. With the given values for these parameters, we generate all the lines of the first quatrain of HA verse in this way:

(13) R, E ---> line 1
R, O ---> line 2
L, O ---> line 3 (T-condition applied)
L, E ---> line 4 (T-condition applied)

Chen notes that each line differs from the one immediately preceding it by a single parameter. The changing parameter varies from R/L to E/O. This line sequencing results in repetition after line 4. So the second quatrain's tonal schema is identical to the first's by virtue of our line sequencing rules. Chen has accounted for the pattern of each line in HA verse and for the fact that the tonal schema of both quatrains is identical.

In 5 above we arbitrarily started with the hems labeled T and T'. If, instead, we label the hems T' and T, we have the foot pattern of T T' T' T. If we consider the R structure where T = E, we'll have the terminal string:

(14) - - v v v - -

This is the pattern for 4,HB. And if we take the R structure where T = O, we'll find:

(15) v v - - - v v

This is the pattern for 3,HB. Now let us keep our hems marked as T' followed by T and look at the L structure. Of course, now we will run into strings to which the T-condition will apply. If we set T = E, we'll have:

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     (16)          -    -    v    v    v    v    -
T-condition--->    -    -    v    v    -    -    v
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This is the pattern for 1,HB. Now let T = O, and we get:

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     (17)          v    v    -    -    -    -    v
T-condition--->    v    v    -    -    v    v    -
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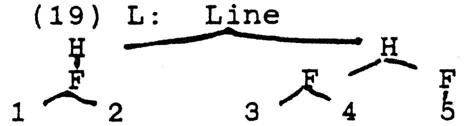
This is the pattern for 2,HB.

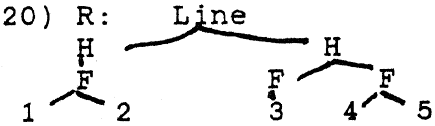
HB verse has now been generated. I list the lines, noting the parameters of branching and tone assignment:

(18) L, E ---> line 1 (T-condition applied)
L, O ---> line 2 (T-condition applied)
R, O ---> line 3
R, E ---> line 4

Again line sequencing involves changing one parameter each line, where that parameter must alternate between branching and tone assignment. So, again, the tonal schema of the second quatrain will duplicate that of the first.

Chen turns to P verse and notes that if we adopt a tree with hems, where hem 2 has the same possibilities as hem 2 of H verse, but hem 1 has only one foot with two positions, we will generate all the lines of P verse:

(19) L:


(20) R:


If a T on one metrical level dominates only a single node on the next metrical level, that node is also a T. But if a T on one level dominates two nodes on the next level, those nodes are T' and T. Since hem 1 of 19-20 contains only one F, that F matches in tone assignment the second foot of H verse. We have now seen an account of why P verse is identical to H verse minus the first foot.

If we set hem 1 to be T, hem 2 will be T'. Now if we take an L structure with T = E, we'll get:

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     (21)      -     -     -    -     v
T-condition--->-     -     v    v     -
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This is 4,PA. If we change T to O, we find:

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     (22)      v     v     v    v     -
T-condition--->v     v     -    -     v
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This is 3,PA. The reader can go on to show that if we look at an R structure and set T = E, we'll produce 1,PA. And if we set T = O, we'll produce 2,PA.

If, instead, we set hem 1 to be T' and we set T = E in the L structure, after application of the T-condition we get 1,PB. If we change T to O, after the T-condition we get 2,PB. When we switch to the R structure with T = E, we find 4,PB. And if we let T = O, we find 3,PB.

Once more all of the lines of P verse are accounted for with a single tree, where we vary the parameters of E/O and R/L and where hem 1 can be T or T'. The line sequencing varies the two parameters in the same way as for H verse. Chen notes variations on these patterns, which we will discuss in section 3 below.

2. Tone labeling. Chen raises an alternative analysis in which direct tone labeling of the nodes in a tree eliminates the need for the T-condition (p.400):

(23) Given sister nodes [N1, N2], N1 is labeled T iff it branches, otherwise N1 is assigned T'. N2 always takes the opposite label to that of N1.

He rejects 23 since it generates bad lines in P verse.

Yip 1980, however, argues against the T-condition and for two tone labeling conventions: one for H verse (that in 23 above), and another for P verse (where her convention for P verse labels N2 as T iff it branches).

Xue 1989 agrees with Yip that the T-condition is to be avoided and that tone labeling of nodes is the correct way to do that. However, he argues that positing different conventions for P and H verse misses the generalization that P verse looks like H verse minus the first foot. Instead, he offers 24 for both H and P:

(24) In a pair of sister nodes [N1,N2], N1 is labeled N' iff it branches, otherwise N2 is labeled N'.

While analyses like Yip's and Xue's do not call for a T-condition, they make use of the tree hierarchy in tone assignment and line sequencing.

3. Metrical grids. Let us use Chen's insight that Chinese regulated verse consists of hems (which both Yip and Xue also use). Let us assume further that every tone will get a place on the lowest level of the grid, but only oblique tones will get a place on the second level. This is a reasonable assumption, since oblique tones, in that they are falling and/or rising, are composite tones. Starting with H verse, hem 1 consists of four tones:

(25)	x	x			1,HA & 4,HA
	x	x	x	x	2,HB & 3,HB
(26)			x	x	2,HA & 3,HA
	x	x	x	x	1,HB & 4,HB

Grid construction for hem 1 is then:

(27) Hemistich 1: Level one has four positions.
Tone Addition: Add two consecutive positions to level two at one end or the other.

We see that Tone Addition is an end-dominant rule, characteristic of grid rules in general.

Hem 2 consists of three tones:

(28)		x	x	1,HA
	x	x	x	3,HB
(29)	x			2,HA
	x	x	x	4,HB
(30)			x	3,HA
	x	x	x	1,HB
(31)	x	x		4,HA
	x	x	x	2,HB

Grid construction of hem 2 at first appears to be:

(32) (first approximation)
Hemistich 2: Level one has three positions.
Tone Addition: Add one or two immediately consecutive positions to level two at either end.

We can see from this statement of the grid construction rules that the two hems are similar. The difference is that hem 2 is missing a grid column at one end. In order to capture this generalization, instead of 32, I propose the following formation rule for hem 2:

(33) Hemistich 2: Delete one column from either end of hemistich 1.

We now need to discover the rules for putting a first hem together with a second to form a line. Since there are two possible grids for the first hem and four for the second, we can produce eight possible different lines. However, only four of these are actually found in verse. (A slash on level one marks the boundary between hems.)

(34) 25	x	x				x	x	1,HA &3,HB
&28	x	x	x	x /	x	x	x	

(35) 25	x	x			x			not found
&29	x	x	x	x /	x	x	x	
(36) 25	x	x					x	not found
&30	x	x	x	x /	x	x	x	
(37) 25	x	x			x	x		4,HA &2,HB
&31	x	x	x	x /	x	x	x	
(38) 26			x	x		x	x	not found
&28	x	x	x	x /	x	x	x	
(39) 26			x	x	x			2,HA &4,HB
&29	x	x	x	x /	x	x	x	
(40) 26			x	x			x	3,HA &1,HB
&30	x	x	x	x /	x	x	x	
(41) 26			x	x	x	x		not found
&31	x	x	x	x /	x	x	x	

Clearly, all lines of H verse are generated. But four lines not found in verse are also generated. We expect the lack of 36 and 41, given Chen's T-condition. So let us (for the moment) adopt a corresponding filter on grid formation:

(42) (first approximation) Grid Tonotactic Filter: If putting two hemistichs together will result in four consecutive like values on level two (that is, a gap of four positions, or four filled positions), the line is rejected.

42 is initially attractive in that it has a naturalness to it; it can be viewed as an anti-clash or anti-lapse mechanism, typical of grids in general (Selkirk 1984).

The remaining question is how to filter out the produced but unattested 35 and 38. 42 will not filter out these lines. If a single filter is responsible for the lack of 36, 41, and 35, 38, we must conclude that despite the apparent naturalness of 42 as an anti-clash or anti-lapse mechanism, this filter is really of a different nature. We find that if we compare the good lines with all the lines which must be filtered out, a pattern emerges: a whole line is good only if hem 2 begins with a column that is like one of its flanking columns and unlike the other. That is, the start of hem 2 may neither draw too much attention to itself (by being different from both of its flanking columns) nor be completely unacknowledged (by being like both its flanking columns). We replace 42 with:

(43) Grid Tonotactic Filter: If putting two hemistichs together results in the second hem beginning with a column that is like or unlike both of its flanking columns, the line is rejected.

With 43 we generate all and only the good lines of H verse.

Now let us ask why the second quatrain is identical to the first and why P verse is identical to the last five