

## The Relation of Duration to Stress In English Fixed Meter - viewed from durational analysis -

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### I. Introduction

This analysis tries to clarify the meaning of metrical foot, in relation to the places, or positions in reciting English fixed meter. And the difference of the durations between feet will disclose the relation of stress and duration to the metrical prototype, which will prove the analysis to be meaningful to recognition of roles of stress and duration in fixed meter.

For the measurement of the duration of the feet in fixed meter, the Macquire 408 was used with selectional operation in Macquintosh computer. Data (4 sonnets of 56 lines in all, and 280 feet with 560 places) were selected among William Shakespeare's 154 Sonnets. The scope difference of selectional boundary in computer is 13 milliseconds (henceforth: msec).

Shakespeare's sonnets have been recited and tape-recorded by many famous movie stars and singers. Among them Sir Guild's has been most favoritely read and recited. The version used here was re-taped in 1965 in London.

### II. Definition of Metrical Foot

Generally speaking, a stressed syllable is the central factor of a foot with a weak, stressless syllable placed before or behind. The foot beginning with a weak syllable is called iambic and the five iambic feet makes an iambic pentameter. Poems or lines in the meter has been representatively argued as the main data of the metrical analysis based on the stress. Accordingly, traditional generative metrics since 1966 (Halle & Keyser) phonologists or metricists have tried to set up metrical rules and clarify the dividing line between Shakespeare and Milton. Kiparsky(1977) and Hayes(1983) seem to get to the destination neatly and in detail, by means of the former by tree-based, and the latter by grid-based theory.

The concepts '*match*' and '*mismatch*', together with '*bracketing*' and '*labeling*' between *metrical pattern* and *stress pattern*, seemed to solve all the problematic, so-called unmetrical lines with the help of the other definition '*command*'. Judging from Kiparsky's theory(1977), Shakespeare, on his own, commands his metrical filters and Milton as well. However, Hayes(1983) insists on the importance of setting up a metrical filter even applied to the very smallest number of 30 unmetrical lines among 12,600 lines of Milton's works. Hayes's distinction makes us to pay our attention to the possibility of only one unmetrical line: whether we can set it aside or we must establish a filter. Is an exceptional line to be disregarded as exceptional? Here we doubt if it is everything to metricity to cut it neatly in a way one is metrical or

the other is unmetrical. What can we do and argue if every line by a poet could be a poetic line? These considerations turn our attention to other factors than to the prosodic feature 'stress'. For example, what is next important to English is, it is natural to say, durations of a foot recited or read, including syllable length and syntactic pause.

Attridge (1982) and Selkirk (1986) show us silent beating at stress clash. For example, Attridge's explanation gives us some evidence and traditional metricists truly have given us more. Attridge commands his generative way of metrical rules by putting a silent beat at stress clash, or destressing a stressed syllable to an off-beat at the places of consecutive stresses.

. . . . s    w    s . . . .	metrical pattern	
1) . . . proud woman . . .	→ → proud ✓ woman	
. . . . s    s    w . . . .	stress pattern	s    w    s    w

And another powerful and significant lines are sought from Hopkin's sprung rhythm. He controls various types by not counting weak syllables or light syllables and overrides by Hopkins. And the resulting stress types make a seemingly irregular line fixed in iambic pentameter. However, even a long line with 17 syllables he freely regards as a line in hexameter, which Kiparsky calls 'a spectacular example':

2) Both are in an unfathomable, all is in an enormous dark(*Heraclitean Fire*)

This line makes readers uneasy. Weak syllables above are eleven: 'are, in, un, -o-, -ma-, -ble, is, in, an, en-', and '-mous'. A hexameter line needs six weak places. Therefore, 'are, in, an' occupy two places (one is an inverted weak place and the other is a regular weak place); -thomable one place; 'is, in, an en-' also get one weak place; the last weak syllable comfortably occupies its own place. What is worse, and what is more difficult to readers, no real syllable occupies the weak place between 'un-' and '-fath-'.

Strong syllables in weak places are found in many English poems. However, it is not so hard to put a silent beat between them as two consecutive strong syllables in a word. Likewise, it is easy for more than two stressless or light syllables to slur when conditions meet prosodic rules. But it is not so easy to contract three or four weak syllables ('is', 'in', 'an', and 'en-') into one by a natural prosodic or metrical rules including resolutions.

Foot has been defined by the concept of 'stress'. But this analysis tries to relate it to the concept of stress, together with 'duration of the place', or together with the length of the position.

### III. Durational Analysis

A typical reciting pattern is hard to decide. However, Guild's recording has been favored for more than forty years and Shakespeare's poetry is one of the most

popular in the world, so the spectacular reading or reciting is unthinkable. So Guild's tape is decided as a model type of reciting Shakespeare's poems.

The Macquire dots the duration with the difference of 13 msec. Selection scope, if changed to smaller or longer, gives the mixed or the beginning part of the first segment of the next sound. Every weak and strong position has been examined and measured more than three times. Exact boundary selection was not so easy, but possible enough to select. The most difficult dotting was to mark the point between the end of the last segment of a phonological phrase and the pause before the beginning segment of the first syllable of another phonological phrase in a recited line.

1. The procedure of the measurements:

- a. projecting each line recited on the display
- b. dotting the boundary of place selection by weak or strong position
- c. confirming the exactness of the place duration
- d. redotting the boundary of place selection by foot
- e. confirming the duration of the hemistich or the whole line

2. The statistics of the measurements:

a. The measurement of places shows that weak place ( marked . ) is shorter than the strong place (marked x); the second strong place is longer than the first; the third is longer than the fourth; the fifth, or the last is the longest. This reminds us of the metrical prototype proposed by Kiparsky(1977), Youmanns(1989)...

b. Including the pauses behind all syntactic boundaries, the fifth strong place is the most prominent, and the next is the second. This proves the duration pattern to have the same contour to the stress pattern.

# 1. average duration of places and feet

posit.	F 1	x	F 2	x	F 3	x	F 4	x	F 5	x
Aver.	275	322	251	574	297	385	284	377	247	1111

c. Each sonnet takes 57 seconds and 541 msec to recite. Each line takes 4 seconds and 129 msec. It takes a little longer than four seconds to recite ten syllables in a line in iambic pentameter, including pauses, and a little longer than fifty seven seconds to recite a whole sonnet of fourteen lines (generally), including pauses. Every sonnet shows a little difference of duration in reciting. It is expected to differ according to the reader and the semantic contents of the sonnet recited. Various conditions will more or less affect the reader's reciting a poem, in duration of feet.

# 2. average duration of sonnets and pauses

Duration	Sonnet	Pause	Total	Line
Average	57.541	.560	58.260	4.129

d. Does every stress in every strong place sound longer and every weak stress in every weak place shorter? The agreement and the disagreement will give an important clue to clarification of the relation between the prosodic features.

1) The cell shows 59.7 % of exact agreement of stress-duration, but 5.4% of exact disagreement (see #3). In addition, the stressed and stressless carry longer duration in proportion of 75.4% (4.3+59.7+5.4+6.0) to 11.8% (1.4+5.4+5.0), which means disagreement of two factors. The rest are all feet with no stressed syllables, composed of weak and weak syllables (however, traditionally, metricists have regarded the second as stronger and Attridge treats them as on-beats. The second place falling on strong place in iambic shows the percentage of 10.7%, higher than the first, or the weak place occupied by weak syllables. Suppose strong place in iambic should be occupied by stressed or longer. Then it amounts to 76.4% (10.7+59.7+6.0).

2) Compared with the irregularity of stress (10.4%: easily are 29 (8+7+8+6) feet found as irregular, or inverted), that of duration between places is smaller but is more significant.

# 3. frequency of appearance (by relation of stress-duration of respective place and foot)

Stress	x .	x .	. .	. .	. x	. x	x x	x x	foot:ft	mismatches
Length	- +	+ -	- +	+ -	- +	+ -	- +	+ -	+: long	strong/weak
percent	1.4	4.3	10.7	7.5	59.7	5.4	6.0	5.0	100.0	10.4%

### 3. Other Interpretations

a) First, strong places generally are about twice longer (1.91 times) than the weak positions. Weak places are frequently found to be five times longer. Spectacularly, the strong place may be 11 times longer (12 times including pause duration) than the short place:

# 4 (sonnet 5)

line	1	2	3	4	5	6	7	8	9	10	extr.	pause	line
11	261 Beau-	298 ties	112 ef-	335 fect	186 with	261 beau-	112 ty	186 were	<b>075</b> be-	<b>820</b> left		.075	2.721

b) Second, weak places with weak syllables show the difference of duration: the weak place generally is occupied by shorter syllables.

# 5 (sonnet 1)

line	1	2	3	4	5	6	7	8	9	10	extr.	pause	line
10	<b>115</b> And	217 on-	186 ly	373 her-	186 auld	093 to	<b>062</b> the	311 gua-	093 dy	745 spring		497	2878
14	093 To	559 eate	<b>093</b> the	745 worlds	559 due,	249 by	<b>155</b> the	559/ grave	<b>249</b> and	342 thee	/ 538		4141

Other examples are found in 10th line of sonnet 1(..the gau/dy...: 62msec/311msec) and (...gau/-dy spring/ :93/745 +pause 497 msec), and in 14 of 1(...To eate/ the worlds due: respectively 93/557, 93/745). We can find 8 more examples in sonnet 5, 3 more in sonnet 8, 2 more in sonnet 14.

c) Third, in the inverted foot the weak place in general possesses the longer duaration.

# 6 (sonnet 8)

line	1	2	3	4	5	6	7	8	9	10	extr.	pause	line
2	<b>634</b> sweets	<b>298</b> with	<b>522</b> sweets	<b>261</b> warre	335 not,	373 joy	112 de-	410 lights	224 in	485 joy:		596	4250
9	<b>708</b> Marke	<b>373</b> how	410 ✓ one	636 string	447 sweet	298 hus-	261 band	112 to	186 an	186 oth-er	300 ✓ 708	373	4996

d) Fourth, even the same weak words are different in duration.

# 7 (sonnet 10)

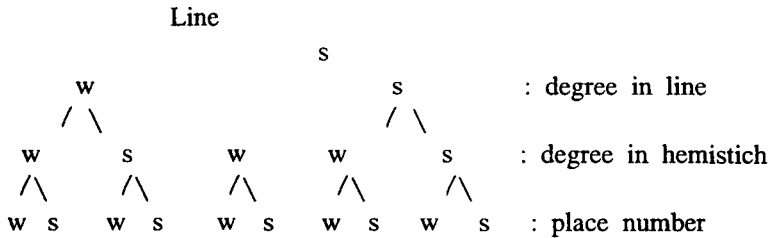
	1	2	3	4	5	6	7	8	9	10	extr.	pause	line
1	186 For	596 shame	186 de-	410 ny	<b>186</b> that	296 thou	485 bear'st	410 love	<b>149</b> to	189 an-y	373	447	3912
9	261 O	485 change	<b>298</b> ✓ thy	522 ✓ thought	<b>224</b> that	261 I	224 may	410 change	224 my	559 minde,	✓ 149 ✓ 260	596	4473
12	224 Or	<b>298</b> to	<b>186</b> thy	485 selfe	075 at	559 least	410 kind-	261 hart-	186 ed	633 prove,		485	3802

More examples in detail are sporadically found. Particulary, *to* and *the* are frequently found to be different in duration in diffenerent places and in different feet. *to* takes 75 msec (sonnet 8, 14th line) 93 (sonnet 1, 10th), 112 (sonnet 5, 3rd; sonnet 8, 9th; sonnet 10, 6th, 8th), 124 (sonnet 1, 5th, 8th), 149 (sonnet 8, 1st, sonnet 10, 1st, 14th), 186 (sonnet 5, 6th), and even 298 (sonnet 10, 12th); *the* takes 62 msec (sonnet 1, 10th), 75 (sonnet 5, 2nd), 112 (sonnet 1, 3rd, sonnet 5, 3th, 4th), 124 (sonnet 1, 9th, 13th), 155 (sonnet 1, 14th).

e) Fifth, the durational aspect of respective foot gives the similar picture to general, metrical prototype, as does the stress contour:

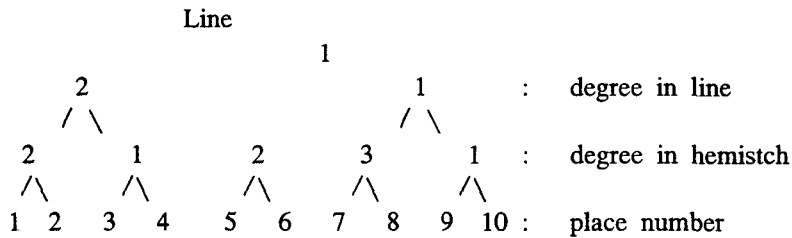
89.6% of stress pattern in all sonnets analyzed matches with metrical patterns, while 77.8% of duratonal pattern does(10.4% of stress pattern mismatches with metrical pattern while 13.9% of duration disagreement appears). It means that stress is more important than duration in English fixed meter.

(1) By stress and rhythm a metrical type is made:



Similarly, we can set up a metrical pattern not based on the stress and rhythm but on the durational rhythm.

(2) By durational aspect a metrical prototype is to be made:



#### IV. Conclusion

This analysis gets a conclusion with results, findings, and facts about the duration of lines in reciting or reading English fixed meter as follows:

1. Each weak place in general takes twice shorter duration to recite than the strong counterpart. Places differ in duration from each other. However, some strong carry 11 times longer duration than the counterpart, even twelve times longer, if pause is added.

2. Durational aspect in reciting lines goes together with aspect of stress in English fixed meter. By the durational figure is to be a similar, metrical prototype set up: 2 feet / 1 foot 2 feet. Basic metrical pattern is not to be changed by durations, but the meter is much more varied by durational variations. Therefore, durational changes of places and feet are likely to be no less important in English meter than the changes of stress.

3. Variation degree by duration of places and feet are much higher than by stress. Differently from the pattern by stress, no two weak places occur based on same duration. However, the difference size is much higher in duration variations than in stress: strong place may be 11 times longer than the weak counterpart. This means, in a sense, stress is the main factor in forming English rhythm.

However high the duration difference between feet may appear, stress flow is never changed in fixed meter. It shows that English is stress-timed. Therefore, this analysis leaves unsolved a problem: what role does the high difference play in forming the rhythm in fixed meter? Surely, duration variations show a similar figure to the metrical prototype by stress. It means that duration plays a role in English rhythm. But the duration varies too much, which suggests the relation of reader's emotional gesture to reciting poems.

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