

Ling 103 Language Structure and Verbal Art

A Phonological Approach to Meter

Predictive Power of Generative Metrics

An important advantage of generative metrics over ‘traditional’ theories of poetic scansion is that generative metrics makes explicit predictions about what lines are **unmetrical**.

Despite many ‘exceptions’ which relax the requirements of syllable counting and correspondence to the template, there remain an infinite number of lines which are **not acceptable**.

Unacceptable iambic pentameter lines containing 10 syllables:

(u /)(u u)(/ u)(u /)(u /)

For péerless divínities do not sleep

iamb — pyrrhic — trochee — iamb — iamb

(u /)(u /)(u u)(/ u) (u /)

When Júno’s rágeful admónishments howl

iamb — iamb — pyrrhic — trochee — iamb

(u /) (u /)(u u) (/ u) (u /)

Upon great dizzying súmmits like dogs

iamb — iamb — pyrrhic — trochee — iamb

Here each line not only has 10 syllables but also has a **majority** of iambic feet. The theory that says that iambic pentameter ‘usually’ contains iambs — but that the poet may use other feet to introduce variety as a kind of ‘poetic license’ — fails to explain why three lines having this type of structure are simply never encountered in Shakespeare. Compare actual verse:

(/ u) (u /) (u /) (/ u) (u /)

Flying between the cold moon and the earth

(/ u) (u /) (u /) (u /) (u /)

Cupid all arm’d: a certain aim he took

(u u) (/ /)(u /)(u u) (u /)

At a fair vestal throned by the west

Grid Theory of Meter

In early generative metrics the template for a given line of verse consists of a sequence of S W and x symbols. In contrast to traditional metrics, there is no concept of 'foot'. The Grid Theory of meter is a more recent version of generative metrics in which the traditional notion of 'foot' is included.

1. Objection 1.

In early generative theory there was no reason why

W S W S W S W S W S

should be an *actual human* metrical template, as opposed to any other arbitrary sequence of W and S symbols.

Suppose that on other planets there exist creatures who speak English but obey a different poetic tradition. Examples:

'*Martian metrics*'

The Fibonacci sequence, being often replicated in Nature, is considered by the Martians to be the perfect basis for a metrical template. Thus, stress maxima occur only on syllables numbered: 1 2 3 5 8 13

The metrical template is:

1 2 3 4 5 6 7 8 9 10 11 12 13
S S S W S W W S W W W W S (x)

Stóp áll dígging, láugh and make mérry, for the compléte
 Rúst réd fissure cléaves the bizárre and sort of mundáne
 Búlldózed quárztz, remóving hor'zontal impediménta!

(From "Song for canal completion")

Our theory is *inadequate* if it fails to exclude the Fibonacci meter as a possible human meter (such a meter does not exist as far as we know in any human culture).

2. Objection 2.

There is no ‘foot’ in the traditional theory, but clearly the metrical template is a sequence of five W S units. This fact has no status in the early theory.

Grid Theory

The essential property of the Grid Theory is that the metrical template is not simply stated as an object (given explicitly as string of symbols), but rather is itself *generated* by a specific *algorithm* (exact procedure).

A *universal theory* of meter — one that is capable of modelling meters in all human languages, but also predicts what meters are *impossible systems* — is then obtained by defining all the ways in which the metrical algorithm may vary.

These options are known as *parameters*, and we speak of parameters being set to various values.

I. General Questions about any meter.

1. What elements of the phonological (pronunciation) of a line of verse are *counted* by the meter?

Typical options:

- a. each syllable (English, subject to elision and syncope)
- b. each *mora* — a unit of syllable *weight* (Greek, Latin)

2. In what ways must the ‘counted elements’ be organized?

To answer this question, we introduce an algorithm that generates a *metrical grid* for a line of verse. A line of verse is well-formed (‘metrical’) if the correspondence rules are satisfied and the metrical grid meets certain conditions.

3. What elements of the line are ‘special’ or ‘privileged’ ?

In stress-based meters such as classical English meters, certain syllables called *stress maxima* are privileged.

II. What is the algorithm for iambic pentameter?

The grid.

A grid consists of layers of grid *lines*, which are strings of grid *marks*, plus the symbols) and (— that is, ordinary parentheses. We can write x or $*$ to indicate the marks (these are alternative notations). The lowest line of the grid is called *line 0* and every subsequently higher line is one number higher.

1	x	x	x	x	x	x	
0	x	$x)$ x	$x)$	x	$x)$	x	$x)$
	\uparrow						

This royall Throne of Kings, this sceptered Isle,

Each element that is counted by the meter — in English this means all syllables except those excluded by elision and syncope — *projects* a line 0 mark.

The height of the column of marks above each line 0 mark indicates its metrical *prominence*. As you can see, the W and S positions of the earlier theory correspond above to grid columns of height 1 and 2 respectively.

Feet.

However, in addition the marks on line 0 are grouped into groups of xs which we will call **feet**.

Use of the parenthesis to define a foot.

Although ordinarily we think of a group of elements as being delimited by an open parenthesis (and a closed parenthesis), from a logical point of view this is redundant. Instead we will make use of a different use of parentheses which will lead to certain simplifications later.

Definition of foot.

A *foot* is an uninterrupted sequence of grid marks either

- a. to the LEFT of)
- b. to the RIGHT of (

Examples:

x x) x x)	two feet
x (x) x	one foot
(x x x	one foot
x x)(x x	two feet
x x x (x	one foot
) x x x	no feet

Head of a foot.

One element of each foot is said to be its *head*. This element is the most prominent element. In nearly all cases, feet are either *right-headed* or *left-headed*.

Right-headed: The head of the foot is its rightmost mark

Left-headed: The head of the foot is its leftmost mark

Examples (the head is underlined for you). Assume right-headed feet.

x <u>x</u>) x <u>x</u>)	two feet
x (<u>x</u>) x	one foot
(<u>x</u> x <u>x</u>	one foot
x <u>x</u>) (<u>x</u> <u>x</u>	two feet
x x x (<u>x</u>	one foot
) x x x	no feet

In contrast with earlier generative theory which simply states the template as an arbitrary object with no internal structure, the Grid Theory makes use of an **algorithm** (set of ordered rules) which **generates** the grid.

Grid-building Algorithm

Step 1. Line 0 Projection: Each ‘counted’ element causes a grid mark to be inserted on line 0. We say that each syllable *projects* a mark.

An extrametrical syllable (whether line-final or phrase-final) does **not** project a mark. We indicate where the mark would have gone by using a **period**. (This in fact makes the algorithm non-deterministic).

This means that when you write grids for lines you must *first determine which are the counted syllables*, by excluding syllables which are uncounted owing to syncope, elision, or extrametricality.

0 x x x x . x x x x x x .
↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑
So fast they follow. Your sister's drowned, Laertes

Step 2. Line 0 Footing. In this step, parentheses are inserted onto line 0 by a procedure that scans the string. The insertion of these parentheses causes the marks to be divided into groups, some of which are feet.

In English ('strict') iambic meter ('iambics') the procedure is:

Scan **right-to-left** (ignoring periods):

a. Insert) and move across one mark.

If no further marks, halt. Otherwise:

b. Move across one mark.

If there aren't any more marks, halt. Otherwise:

Go to step a.

0 x x) x x) . x x) x x) x x .
↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑
So fast they follow. Your sister's drowned, Laertes

All this does is group the xs into groups of 2 starting from the right edge.

begin

```

      x  x  x  x  x  x  x  x  x  x  x  ↴
a
      x  x  x  x  x  x  x  x  x  ↴  x )
b
      x  x  x  x  x  x  x  x  ↴  x  x )
a
      x  x  x  x  x  x  x  ↴  x )  x  x )
b
      x  x  x  x  x  x  ↴  x  x )  x  x )
a
      x  x  x  x  x  ↴  x )  x  x )  x  x )
b
      x  x  x  ↴  x  x )  x  x )  x  x )
a
      x  ↴  x )  x  x )  x  x )  x  x )
b
      ↴  x  x )  x  x )  x  x )  x  x )
halt

```

Step 3. Line 1 Projection.

Line 0 feet are **right-headed**.

The **head** of each line 0 foot projects a mark to line 1.

1	x	x	x	x	x	x				
	↑	↑	↑	↑	↑	↑				
0	x	x)	x	x)	.	x	x)	x	x)	.
	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑

So fast they follow. Your sister's drowned, Laertes

Once Line 0 Projection and Footing and Line 1 Projection have taken place, the line can be evaluated as metrical or non-metrical. A line is metrical if it meets the:

Well-formedness condition:

- a. There are n marks on line 1 ($n = 5$ for pentameter, 6 for hexameter ...)
- b. The 'privileged' elements of the line of verse (i.e. stress maxima) are associated with line 1 marks.

Note: Projection creates an association relation, which is transitive. So if a syllable is associated with a line 0 mark which is associated with a line 1 mark then that syllable is associated with that line 1 mark.

1	x	x	x	x	x	x				
	↑	↑	↑	↑	↑	↑				
0	x	x)	x	x)	.	x	x)	x	x)	.

So fast they follow. Your sister's drowned, Laertes

- a. There are five marks on line 1.
 - b. Stress maxima occur in *follow*, *sister* and *Laertes*. Each one is associated with a line 1 mark.
- ⇒ The line is therefore *metrical*.

IV. Complications

I. Line-initial ‘missing’ syllable.

This is acceptable since the scan may halt on step b or step a.

1	x	x	x	x	x
0	x)	x	x)x	x)x	x)x.
	↑	↑	↑↑	↑↑	↑↑
	I	am	dying,	Egypt,	dying only

There are still five feet — a line-initial foot may end up having only one mark, but given the definition of foot we are using this does not disqualify it from being a foot.

II. Phrase-boundary not marked by punctuation.

Recall that Shakespeare allows the stressed syllable of a polysyllabic word to appear in a W position (= non-head position of a foot), provided that this position occurs at the beginning of a phrase or line.

Line-initial:

Making their tomb the wombe wherein they grew? Son.86.4

Corrall is farre more red, than her lips red Son.130.2

Simply I credit her false speaking tongue, Son.138.7

Lillies that fester, smell far worse than weeds. Son.94.14

Phrase-initial in the middle of the line:

By drunken Prophesies, **Labels**, and Dreames R3.1.1.33

When that the poore have cry'de, **Caesar** hath wept : JC.3.2.91

Appeare in person here in court. **Silence** ! WT.3.2.10

By leaving earth ? **Comfort** me, counsel me ! RJ.3.5.208

Complication: there are some occasions where the beginning of the phrase is not marked by the editors with punctuation. Occasionally there will be a 'cancelled' stress maximum at the beginning of such phrases:

Be thy intents [**wicked** or charitable] Ham.1.4.45

Nor with thy sweets [**comfort** his ravenous sense] R2.3.2.13

Upon the slime and ooze [**scatters** his grain] Ant.2.7.22

IV. Rhythm Rule Stress Retraction.

The English 'Rhythm Rule' is a general rule of English pronunciation (= phonology) which causes the accent of a polysyllabic word to move leftward when immediately followed by another stressed syllable:



ó

Rhythm Rule Stress Retraction

σ

ó

ó

→

ó

σ

ó

New Yórk súbway

→

Néw York súbway

bambóo táble

→

bámboo táble

Japanése lánguage

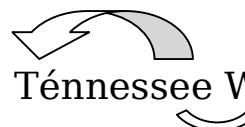
→

Jápanese lánguage

When two stressed syllables are adjacent we speak of a stress *clash*. The Rhythm Rule moves the first stress back one syllable to 'repair' the clash.



Ú C L A fóotball



Ténnesseee Wílliams



thírteen Jápánese



bámboo tábles

Stress retraction can also occur historically and accounts for many words which may have two pronunciations.

mustáche ~ mústache	garáge ~ gárage
brochúre ~ bróchure	therefóre ~ thérefore
perfúme ~ pérfume	lémonade ~ lemonáde
gasolíne ~ gásoline	salón ~ sálon
ballét ~ bállet	princéss ~ príncess
garáge ~ gárage	lémonade ~ lemonáde
therefóre ~ thérefore	salón ~ sálon

Not all words can undergo retraction. The syllable that stress is retracted to usually must not be fully reduced to schwa /ə/ in the form in which it is unstressed:

refíne	*réfine	convérge	*cónverge
equíp	*équip	befóre	*béfore
políte	*pólite	Deníse	*Dénise

Because the Rhythm Rule can affect where the stress of a polysyllabic word goes, it may have important consequences for metrical well-formedness.

1	x	x	x	x	x	x
θ	x	x) x	x) .	x	x)	x
	↑	↑ ↑	↑	↑	↑	↑ ↑ ↑

Nor Cáesar's válour hath o'erthrówn Ántony

But in many, many cases we actually do not know if the Rhythm Rule is responsible for a change in the position of stress in a word or if the word was in isolation pronounced with a different stress in early Modern English:

The pangs of **dispríz'd Lóve**, the Lawes delay Ham. 3.1.72

These **anticke fábles**, nor these Fairy toyes Mid. 5.1.3

Summary

Points in the algorithm where uncertainty may arise:

1. **Syncope & Elision.** Option of ignoring certain otherwise countable elements. In cases of obligatory Elision or Syncope there will be a syllable which does not count, i.e. does not project a line 0 mark.
2. **Extrametrical syllables.** At phrase-end or line-end, a stressless syllable may fail to project a mark on line 0. To indicate such a syllable it is customary to write a period instead on line 0.

Metrical parameters define a metrical ‘grammar’

A particular **type of meter** is defined by a choice (or ‘setting’) of the following **parameters**:

Parameters in the Grid-building algorithm

- A1. What **elements** (syllables, moras, certain types of syllables, etc.) ordinarily project line 0 marks? Of these, which can be ignored for the meter?
- A2. Scanning **direction**: right-to-left or left-to-right
- A3. **Size of foot**: two or three xs crossed before inserting new parenthesis (= binary vs. ternary foot)
- A4. **Headedness** of foot: right-headed or left-headed?

Parameters in the Well-Formedness Condition:

- B1. Choice of **number of marks** on line 1 that are necessary
- B2. Choice of which pronunciation properties of the line are ‘privileged’ in such a way that they have to be matched appropriately to heads of feet, e.g. the *stress maxima*.

Parameter settings for English iambic pentameter:

A1. **syllables**

Permitted exceptions: phrase- and line-end; syncope; elision)

A2. **right-to-left**

A3. **binary**

A4. **right**-headed

B1. **5**

B2. **stressed syllables of polysyllabic content words**

(except after phrase boundary) are associated with line 1 marks

By setting the parameters differently, we can generate other meters.

Iambic hexameter:

B1 = **6**

Trochaic tetrameter:

A1 Permitted exception: line-beginning

A2 = **left-to-right**

A4 = **left**

B1 = **4**

Limerick:

A1 Permitted exception: one or two at line-end

A3 = **ternary**

B1 = stanza of **3, 3, 2, 2, 3**

etc.

Practice. Assign a metrical grid to each line below indicated with ! in the margin (passage from *The Tempest*). Note that sometimes a line is spread between two characters.

PROSPERO

For this, be sure, to-night thou shalt have cramps, !

Side-stitches that shall pen thy breath up; urchins !

Shall, for that vast of night that they may work,

All exercise on thee; thou shalt be pinch'd

As thick as honeycomb, each pinch more stinging

Than bees that made 'em. !

CALIBAN

I must eat my dinner. !

This island's mine, by Sycorax my mother,

Which thou tak'st from me. When thou cam'st first,

Thou strok'dst me and mad'st much of me, wouldst give me !

Water with berries in't, and teach me how !

To name the bigger light, and how the less,

That burn by day and night: and then I loved thee
And show'd thee all the qualities o' the isle, !
The fresh springs, brine-pits, barren place and fertile:
Cursed be I that did so! All the charms !
Of Sycorax, toads, beetles, bats, light on you! !
For I am all the subjects that you have,
Which first was mine own king: and here you sty me
In this hard rock, whiles you do keep from me
The rest o' the island. !

PROSPERO

Thou most lying slave, !
Whom stripes may move, not kindness! I have used thee,
Filth as thou art, with human care, and lodged thee
In mine own cell, till thou didst seek to violate
The honour of my child.