

Metered Verse

Paul Kiparsky

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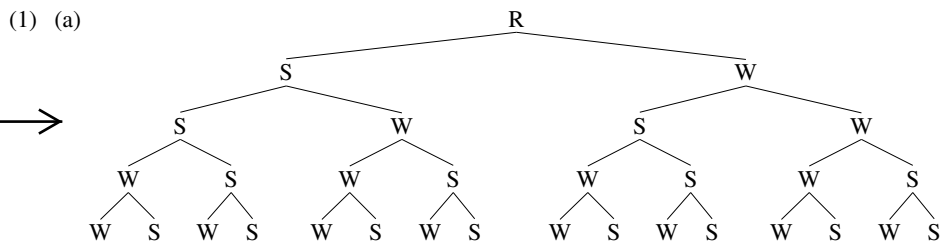
1. RHYTHM AND STRESS



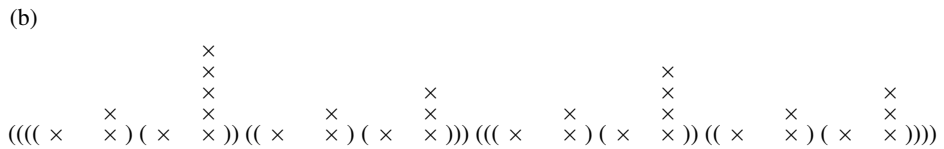
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Meter has been called the heartbeat of poetry. But like language itself, and music and dance, it pulsates more intricately than anything in the biological or physical world. While each beat of a healthy heart is identical to the next, meter is based on the regular **ALTERNATION** of prominent and nonprominent beats (stressed/unstressed, strong/weak, downbeat/upbeat).¹ The prominent beats in turn alternate between more prominent and less prominent beats, and so on, up to a unique culmination, generating a **PROMINENCE HIERARCHY** within a domain (Lieberman & Prince 1977). In addition, the prominence peaks at each level of such a hierarchy are grouped with preceding or following less prominent units into **MEASURES**, usually resolvable into binary constituents in language and meter, but often irreducibly ternary in music and dance. The mind imposes periodicity and constituency even on objectively undifferentiated sequences of beats: we hear the “tick-tick-tick” of a watch as a sequence of “tick-tock” units.

These aspects of rhythmic organization shared by meter and language – alternation, hierarchy, and grouping – can be represented by trees in which each nonterminal node has a unique **S**(trong) immediate constituent, or equivalently by bracketed grids where relative prominence is represented by column height (Prince 1983).



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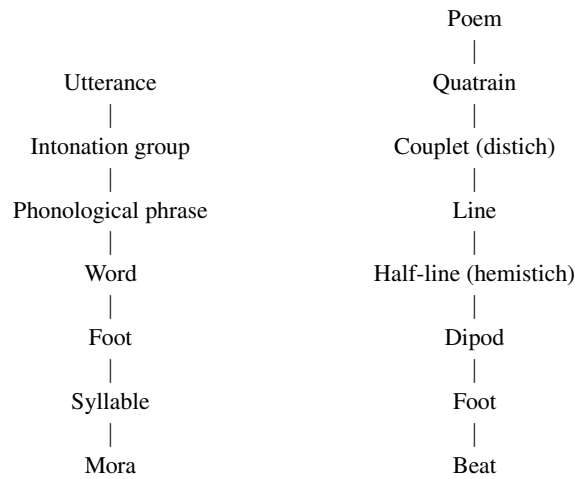
The tree representation (1a) and the bracketed grid representation (1b) convey exactly the same information and are interconvertible. However, they differ somewhat in the formal operations and constraints that can be perspicuously expressed in them.

Certain constituents in the hierarchy have substantive properties of their own. In phonology, these constituents make up the **PROSODIC HIERARCHY**; its stylized counterpart in verse is the **METRICAL HIERARCHY**, which appears to be strictly binary and hence does not map onto the prosodic one.

¹However, certain pathologies are manifested by binary rhythms between or within heartbeats, e.g., **PULSUS ALTERNANS**, an alternation between strong and weak heartbeats, and **DICROTIC pulse**, with two beats per cardiac cycle, the first on the systole, the second on the diastole. Even the single pulse of a normal heartbeat is actually generated by two contractions, of the atria and ventricles in that order, which in turn form part of a physiologically complex cardiac cycle. Nature abounds in multiphasic there seems to be no reason to consider them to be alternations between prominent and nonprominent beats. In any case, nothing in nature comes close to the depth of hierarchical rhythmic organization seen in the cognitively structured domains of dance, music, verse, and language itself.

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- (2) (a) Prosodic hierarchy (in language) (b) Metrical hierarchy (in verse)



The prosodic and metrical hierarchies are subject to STRICT LAYERING, a violable constraint which militates against skipping levels and against improper bracketing (Itô and Mester 2003[1992]).

(3) STRICT LAYERING

- a. A nonterminal unit of the prosodic hierarchy, X^P , is composed of one or more complete units of the immediately lower category, X^{P-1} .
- b. A nonroot unit of a prosodic hierarchy, X^P , is completely contained in a unit of the immediately superordinate category, X^{P+1} .

A consequence of the grounding of meter in language is that lineation and length restrictions are not defined by counting feet or any other units in (2b) – for phonology cannot count past two. They emerge from constraints on the hierarchical rhythmic structure that versification imposes on texts (Chen 1980, Kiparsky 2006). Accordingly an iambic pentameter is not just a sequence of five iambs: it is built from cola that are themselves built from feet. Some of the evidence that confirms this prediction will be summarized in Section 3. It follows that the line has no privileged status over the couplet or the stanza, which are often defined by additional metrical constraints on lines, and that lineation is in part conventional, in that any place where an obligatory major prosodic break in the verse regularly divides equivalent units may be considered a line break, by convenience or tradition. 4343 ballad quatrains can be printed as fourteeners distichs and vice versa, and 3343 quatrains are interchangeable with poulter’s measure. Some editions of the *Kalevala* print its 8-syllable parallel couplets as single 16-syllable lines, and nobody minds. These considerations argue against the contrary view (Fabb & Halle 2009: 242) that lineation and length restrictions are the primary property of verse, and that meter arises as a by-product of counting syllables to fix the length of lines, with rhythm an epiphenomenal “property of the way a sequence of words is read or performed.”

In addition to its constitutive structural properties of hierarchy and constituency, meter is enlivened by excursions such as syncopation, skipped beats, doubled beats, and extrametrical beats, followed by return to the regularly alternating baseline rhythm. A heart that pulsates like verse would have its owner sent, with sirens screaming, to the nearest cardiological ward.

But the complexity is regimented. A meter is defined by a set of constraints on the distribution of prominence-defining phonological features and on the misalignment of linguistic constituents (words, phrases, sentences) with metrical constituents (feet, dipods, cola, lines, stanzas). These constraints can depend on genre and period, and on the level of the hierarchy at which the mismatch occurs. The iambic pentameter of Shakespeare’s dramatic verse offers an extraordinarily abundant metrical palette (described in Section 3 below), that of his sonnets less so, but both are metrically richer than Pope’s neoclassical heroic couplets, and even that tight form still offers some options denied to most German or Russian verse.

In virtue of being subject to well-defined constraints, metrical verse is the simplest, unmarked form of literary language — indeed in many unwritten literatures the first or only form. Prose is a more complex form of literature (as pointed out already by Herder 1768, see Hanson & Kiparsky 1997), distinguished by rhythmic variety, and often by the avoidance of metrical cadences (antimetricality, Borgeson et al., to appear).

Metrical verse, lyric as well as epic, is common in preliterate cultures.² Even in written literatures, all metrical verse is in principle oral, for writing systems reflect prominence-defining phonological features imperfectly if at all, and the graphic properties of a text, including spacing and line breaks, are not in themselves constitutive elements of verse, but cues to phonological phrasing and lineation. A metrical system is not only a cultural artifact, but molded within the limits of cognitive and linguistic constraints by functional pressures, of which the most important are that the metrical repertoire should be as expressive as necessary to accommodate the language (FIT), and as restrictive as possible within those bounds (INTEREST) (Hanson & Kiparsky 1996).

The goal of GENERATIVE METRICS is a “grammar” of meter, rather than a “dictionary.” It aims to characterize metrical systems as points or regions in a typological space, with linguistic theory the main theoretical model and explanatory engine. Its fundamental hypothesis is that the metrical form of verse is a stylization of phonological form. Appropriately formalized, this predicts a typology of possible verse meters which is more narrowly constrained than musical meters in several respects. In particular, verse meter inherits from phonology a strict binarity. Ternary measures, ubiquitous in music, are in verse constructed from binary ones by beat-splitting. While polymeters and nonisochronous (“additive”) meters such as 2-2-3-2-3 or 2-2-2-2-1 $\frac{1}{2}$ -1 $\frac{1}{2}$ are used in musics of Africa and South Asia, they are not found not in their poetries (Deo 2007).

Another consequence of the grounding of meter in language is that lineation and length restrictions are not defined by counting feet or any other units in (2b) – for phonology cannot count past two – but rather by their abstract hierarchical organization. Accordingly an iambic pentameter is not just a sequence of five iambs: it is built from cola that are themselves built from feet. Some of the evidence that confirms this prediction will be summarized in Section 3.

Several approaches to generative metrics are currently being explored (Blumenfeld 2015). One line of investigation which has proved productive treats meter as a mapping of abstract verse patterns (“templates”) to their permissible linguistic instantiations. Both templates and their instantiations can be represented by bracketed grids or labeled trees as in (1). The abstract verse patterns can be characterized by systems of ranked Optimality-Theoretic markedness constraints, of the same type as the constraints that govern the prosody of language itself. Evidence is mounting that they are very

²See Beissinger 2012 for a concise review of the major traditions of oral and oral-derived poetry, with bibliography.

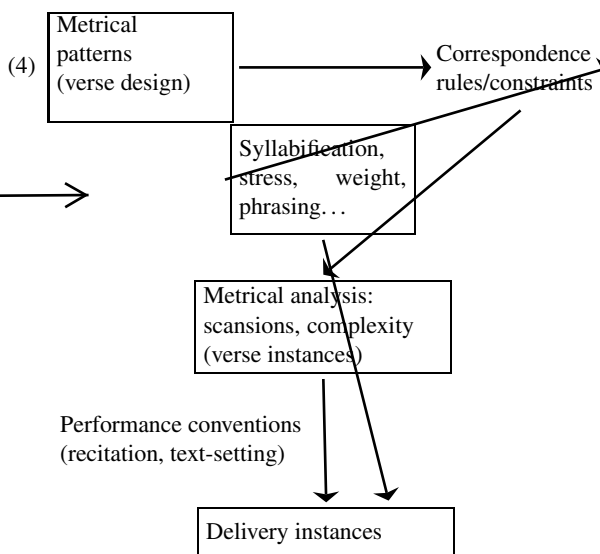
simple and uniform.³ All the complexity is located in the constraints that delimit the permissible mismatches between abstract metrical patterns and the linguistic patterns of prominence that realize them. These can be formalized by Optimality-Theoretic correspondence constraints. The output of this constraint evaluation is a METRICAL ANALYSIS, which specifies whether a given text instantiates (i.e., legitimately corresponds to) a given abstract metrical pattern, and if so, how complex the instantiation is, as measured by the licensed violations it incurs.

Vocal performance in in song, recitation, and drama can profitably be included in the theory, since it is shaped both by meter and by linguistic form, and since prevailing styles of performance historically influence meter. We can model conventions of text-setting as an interface between composition and delivery. The structure of a metrical theory is accordingly as follows.

³For instance, there is no such thing as “trochaic substitution” in iambs: an inverted initial foot is still an iamb, its inversion licensed by the correspondence rules (Kiparsky 2007).



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The constraints not only define the space of metrical variation, but also predict the relative frequencies of the permissible variant types (Kiparsky 2006).

According to (4), composing and performing a song requires matching three hierarchies of alternating prominence: an intrinsic PROSODIC FORM assigned by the language’s phonology, independently of how it is versified, a METRICAL PARSE, independent of how the text is set to music, a MUSICAL RHYTHM, independent of the words that may be sung to it. The metrical structure of a text is invariant and does not change with the way it is set to music or performed. Each rhythmic tier is representable by a hierarchical tree or grid structure, but subject to its own constraints. The required correspondences and permissible mismatches between them are regulated by conventions that evolve historically within limits grounded in the faculty of language. Predominant metrical systems and recitation/singing/textsetting practices in a poetic tradition are mutually accommodated, and in time mutually optimized. Performance can be “tilted” to reflect meter, and metrical forms must be compatible with prevailing text-setting/recitation practices. For example, the 18th century practice of reciting verse by highlighting the meter made it impossible to read the work of poets like Wyatt and Donne in a natural way, and demanded poetry that could be metrically parsed with a minimum of mismatches.

The model in (4) allows for cases where a literary tradition accesses a different grammar than the ordinary language. For example, metrical practice can be based on the phonology of an earlier stage of the language. In traditional French versification, consonants that are deleted in word-final position count for purposes of rhyme, except that homorganic final voiced and voiceless obstruents are treated as equivalent. For example, *long* and *tronc* rhyme, but neither of them rhymes with *rond* or *pont*, which however rhyme with each other; none of them rhyme with *son*. Phonemically and phonetically all five words end alike: /tʁɔ̃/ [tʁɔ̃], /lɔ̃/ [lɔ̃], /mɔ̃/ [mɔ̃], /vɔ̃/ [vɔ̃], /sɔ̃/ [sɔ̃]. Morphophonologically they all end differently: {tronk}, {long}, {pont}, {rond}, {son} — the consonant shows up before suffixes, as in *tronquer*, *longue*, *pontier*, *ronde*, *sonner*. The two rhyming pairs match correctly at the output of the lexical phonology, argued in Kiparsky 2018a to be a significant level or representation. By final devoicing, *long* and *tronc* both end in /-k/, and *dont* and *rond* both end in /-t/. The evidence that final

devoicing takes effect at the word level whereas final deletion is postlexical is that, in the classical *liaison* system (now as old-fashioned as the rhyming convention that reflects it) final voiced stops appear in devoiced form before a following vocalic word in close contact, e.g., *long hiver* [lɔ̃.ki.vɛʁ] ‘long winter’, *grand homme* [grɑ̃.tɔ̃m] ‘great man’. Therefore they must enter the postlexical phonology with the final consonant present in devoiced form. In sum, traditional French versification conventions crucially refer to the lexical representation that is computed by the word phonology and forms the input to the sentence phonology:

- (5)
- Underlying (morphophonemic representation): {tʁɔ̃nk}, {lɔ̃ŋ}, {pɔ̃t}, {vɔ̃d}, {sɔ̃},
 - Lexical representation: /tʁɔ̃k/, /lɔ̃k/, /pɔ̃t/, /vɔ̃t/, /sɔ̃/
 - Phonetic (and structuralist phonemic) representation: [tʁɔ̃], [lɔ̃], [pɔ̃], [vɔ̃], [sɔ̃]

That such fine points of rhyming outlived the 16th century pronunciation they reflect for several centuries is presumably due to the fact that the living morphophonology of the language kept them intelligible.

2. PROMINENCE

A meter may require prominence in Strong positions, or prohibit prominence in Weak positions, or both. Prominence is expressed by stress, syllable weight, and/or pitch. None of these features are intrinsically binary: languages can have degrees of stress and weight, and distinctive levels and contours of pitch. The continua are exploited to give texture to verse (Ryan 2018), and indeed to literary prose. But remarkably, in categorical constraints they are all binarized – another manifestation of the pervasive binarity of verse structure. Stress meters (syllabotonic meters) work with a binary distinction between stress peaks and nonpeaks. It may be defined on different units in the hierarchy (2), each potentially constrained by meter, but always binarily. Quantitative meters, found in classical Greek, Arabic, Sanskrit, Persian, Urdu, Hausa, Somali, and Hungarian, among other languages, establish a binary distinction between LIGHT syllables, with one unit of length, or mora, and HEAVY syllables, with two or more moras. Tone-based meters, such as Chinese regulated verse and Vietnamese Luc Bat, are based on a binary division between the language’s lexical tone categories.

Some metrical systems involve interactions of two or even three prominence features: Latin and in Skaldic verse obey separate constraints on quantity and stress, and Finnish and Tamil impose special weight conditions on stressed syllables (Ryan 2017). In the *deseterac* meter of Serbian epic songs, stress, weight, and pitch accent all seem to be relevant (Zec 2009), again as binary features.

It appears that the prosodic features that play a role in a language’s verse are limited to those which are ACTIVE in its phonology, either phonemic (distinctive/contrastive), or conditioning processes of word phonology (Kiparsky 2018a). For example, in the phonological systems of Hindi-Urdu, classical Arabic, Finnish, Czech, Latin, and Hungarian, vowel length is distinctive and primary word stress is predictable. Yet only the former two languages rely exclusively on syllable weight in their versification; the others exploit both these prosodic features to varying extents. This is because word stress plays a crucial role in their respective lexical phonologies, and a negligible one in those of Hindi-Urdu and Arabic. Turkish offers intralinguistic confirmation: the Persian-derived classical meters of Ottoman Turkish are based on syllable weight, while the popular modern meters are based on stress. Correspondingly, vowel length is distinctive only in the Persian-derived (ultimately Arabic) vocabulary that the classical Turkish meters use. English, German, and Swedish meters are almost exclusively

stress-based, though syllable weight interacts with their lexical phonologies in ways that are reflected in some of their meters. Russian has *only* stress, and consequently *only* stress-based meters, with syllable weight playing no discernible role. Mordvin has neither lexical stress, nor vowel quantity, nor distinctive pitch, and its meters are consequently syllable-counting with variable line divisions as the principal rhythmic device (and tend to compensate by rich nonmetrical devices such as rhyme, phrasing, and parallelism). French stress is basically a phrase-level feature, and its meters are basically syllable-counting, with phrase-final stresses matched to strong beats in some genres (Dell and Halle 2009).

Since syllable weight plays an important role in English phonology and versification,⁴ it may seem surprising that all attempts to create wholly or partly weight-based meters in English have failed. Not that these solo efforts produced bad poetry: on the contrary, Philip Sidney's quantitative hexameters and elegiac distichs in *Old Arcadia* are quite attractive, and Hopkins' Sprung Rhythm, a new meter of his own devising which is based on both stress and weight, is the vehicle of some of the most gorgeous verse the language has to offer.⁵ The real reason that Sidney's and Hopkins' innovative weight-sensitive meters failed to gain traction is probably the phonological opacity of the English syllable weight distinction, due to its dual role in both conditioning stress in the lexical phonology (Chomsky & Halle 1968), and being in turn itself modified by stress-conditioned resyllabification in the postlexical phonology (Kahn 1976/2015). Generative phonology reveals the phonological rationale behind the quantitative experiments, and vindicates them against complacent critics who denied the phonological status of syllable quantity in English,⁶ and blamed the poets for being confused.⁷

Most quantitative meters select one or more constraints from the following menu:⁸

- (6) a. Strong positions
 - 1. Must be a bimoraic foot \asymp (less restrictive)
 - 2. Must be a bimoraic syllable – (more restrictive)
- b. Weak positions
 - 1. Cannot be a bimoraic foot \asymp (more restrictive)
 - 2. Cannot be a bimoraic syllable – (less restrictive)

⁴See below on W-resolution, which makes the moraic trochee the maximal occupant of a metrical position, a quantitative principle that remained alive from Beowulf through the 20th century.

⁵The rest of this paragraph draws on Kiparsky 1989 for Sprung Rhythm, and Hanson 2001 for Sidney's quantitative verse.

⁶"Since the would-be quantitative poet was obliged to remember constantly the arbitrarily assigned 'quantities' of the English syllables he chose to use, quantitative composition was a laborious academic-theoretical business, like all such nonempirical enterprises more gratifying to the self-congratulating practitioner than to the perplexed reader." (Fussell 1979: 68), "The rules that the poets used for determining syllable quantity applied to the written text, but not necessarily to what one would hear . . . We must conclude that the quantitative experiment is somewhat like a written code — one needs to count and measure letters in order to determine the system." (Hollander 1985: 65–6), "Length in Modern English is phonetic rather than phonemic" (Steele 1999: 267).

⁷"This atmosphere of confusion and muddlement enwraps almost all those who commit whoredom with this enchantress [quantitative meter];" "a curious measles or distemper which, dangerously but not by any means without beneficial results, affected English poetry . . . for more than half a century" (Saintsbury 1908–10, vol. 2: 168), "unnatural, arbitrary, inconsistent, and dependent on spelling" (Attridge 1974). To his credit, Attridge did recognize that Sidney tried to base his quantitative verse on the actual pronunciation of English, understood the distinction between weight and stress, was aware of the role of quantity in English, and tried to align stress with the ictus.

⁸In (6) and (7) \cup stands for a light syllable, – for a heavy syllable, and \asymp for a heavy syllable or two light syllables.

Note that a meter in which both (a2) and (b1) are enforced is isosyllabic.

The various binary meters of Greek and Latin exploit all these options (West 1982: 88–93, Kiparsky 2018b):

- (7) a. Strict iambic verse, with feet of the form (◡ –): (6a2), (6b1)
- b. Iambic with resolution in S, with feet of the form (◡ ∞): (6a1), (6b1)
- c. Iambic with resolution in S and split W, with feet of the form (◡ ∞): (6a1), (6b2)

In ternary quantitative meters, both S and W are bimoraic (moraic trochees), and the correspondence constraints on positions determine the distribution of their monosyllabic and disyllabic realizations.

Tonal meters are widespread in Southeast Asia. A typical form is the popular Vietnamese Luc Bat “six–eight” stanza, with alternating six-syllable and eight-syllable lines. Words fall into two tonal classes, flat (*bằng*) and sharp (*trắc*). Flat words have either no tone or a low falling tone. Sharp words can have one of the tones that have a High component, *sắc*, *hỏi*, *ngã*, or *nặng*. The example in (8) is from *Kim Vân Kiều* “The Tale of by Kiều” by Nguyễn Du.

- (8) Trăm năm, trong cõi người **ta**,
 Chữ tài, chữ mệnh, khéo **là** ghét **nhau**.
 Trải qua một cuộc bể **đâu**,
 Những điều trông thấy mà **đau** đón **lòng**;
 Lạ gì bỉ sắc, tư **phong**,
 Trời xanh quen thói má **hồng** đánh ghen.
 Within the span of hundred years of human existence,
 what a bitter struggle is waged between genius and destiny!
 How many harrowing events have occurred while mulberries cover the conquered sea!
 Rich in beauty, unlucky in life!
 Strange indeed, but little wonder,
 since casting hatred upon rosy cheeks is a habit of the Blue Sky.
 (Trans. Lê Xuân Thuy)

The end of an eight-syllable line rhymes with the end of the next six-syllable line and with the sixth syllable of the next eight-syllable line (rhymes bold-faced in (8)). Two words rhyme if both have sharp or flat tone, and identical or similar codas (rhymes with identical nuclei and codas are considered perfect). Even-numbered syllables, which I assume to be the heads of binary feet, are tonally restricted as shown. The schema is shown in (9), where b=Flat, #=Sharp, ×=unspecified.⁹

- (9) × b × # × b_a
 × b × # × b_a # b_b
 × b × # × b_b
 × b × # × b_b # b_c

⁹ The schema is adopted from http://en.wikipedia.org/wiki/Lục_bát, where more references are given. An exception mentioned there is that the second syllable in odd lines is free when there is a break after the third.

- b. At the end of a verse and before a phrase boundary, there can be an additional Weak position (an EXTRAMETRICAL syllable), shown by a slur.

The principal correspondence constraints are those in (13).

- (13) a. CONSTRAINT ON POSITIONS: A position contains one syllable. (Obeyed in standard binary meters of English, except under the conditions specified below.)
 b. CONSTRAINT ON WEAK POSITIONS: A Weak position cannot contain a stress peak. (Obeyed in standard binary meters of English, except for verse-initial and phrase-initial position.)

Compare the passage from Shakespeare in (14a) with its constructed unmetrical counterpart (14b), obtained by replacing monosyllabic stresses by polysyllabic ones (boldfaced) to create violations of the Weak Position Constraint.

- (14) a. And thou, / thrice-crow/nèd Queen/ of Night, / survey
 With thy / chaste eye, / from thy / pale sphere / above,
 Thy hun/tress' name / that my / full life / doth sway. *AYL* 3.2.2–4
 b. *And thou, / well-main/**tain'd** Queen / of Night, / survey
 *With con/**cealed** eyes, / from re/**mote** /spheres above,
 *Thy hun/tress' name / that en/**tire** lives / doth sway. (construct)

In the blank verse of Shakespeare's plays, optional ELISION and RESOLUTION allow a sequence of syllables to occupy a single position. Elision is the phonological reduction of two syllables to one, either by SYNCOPE or by CONTRACTION.

- (15) SYNCOPE elides a short vowel before a sonorant between a stressed syllable and an unstressed syllable within the same word.
 a. I speak / not as / in ab/**solu**te fear / of you. (*Mac* 4.3.39)
 b. And see/ing ig/**norance** is / the curse / of God (*H6.2* 4.7.72)
 c. Upon / thy eye-/balls mur/**derous** ty/ranny (*H6.2* 3.2.55)
 d. That good / Duke Humph/rei trai/**torously** / is murder'd (*H6.2* 3.2.124)

Syncope usually does not apply at the end of a line or before a break. It remains a live process in modern English, e.g., e.g., *infinite* → *inf'nite*, *gén(e)rative*, versus *générate*.

- (16) CONTRACTION elides an unstressed vowel after a stressed one:¹¹
 a. Then, **see**ing / 'twas he / that made / you to / depose (*H6.3* 1.2.26)
 b. Thou **goe**st / to Co/ventry, / there to / behold (*R2* 1.2.258)
 c. A sooth/**sayer** bids you / beware / the Ides / of March (*JC* 1.2.19)

¹¹ A few words allow contraction across *v*: *ne'er*, *o'er*, *e'en*, but not **cle'er*, **clo'er*, **bea'er*.

While these two elision rules are optional processes of the poetic language itself, resolution is a *metrical* license located among the correspondence constraints, which allows placing two syllables in one position. Being a metrical license, (1) it is not reflected in actual pronunciation, (2) it is sensitive to metrical structure, applying to S but not W positions, and (3) it is restricted to specific meters. Shakespeare's dramatic verse uses two types of resolution: W-Resolution and F-Resolution (unmetrical constructs added to show the limits of the operation).

(17) W-RESOLUTION: A light stressed syllable followed by another syllable within the same word can occupy a single Strong metrical position.

- a. $\left\{ \begin{array}{l} \text{Tyranni/cal} \\ * \text{Identi/cal} \end{array} \right\}$ power: / if he / evade / us there (*COR* 3.3.2)
- b. Stoop with / oppres/sion of / $\left\{ \begin{array}{l} \text{their prodi/gal} \\ * \text{majesti/ cal} \end{array} \right\}$ weight (*R2* 3.4.34)
- c. Of god/like $\left\{ \begin{array}{l} \text{ami/ty} \\ * \text{chasti/ty} \end{array} \right\}$; which / appears / most strongly (*MV* 3.4.3)

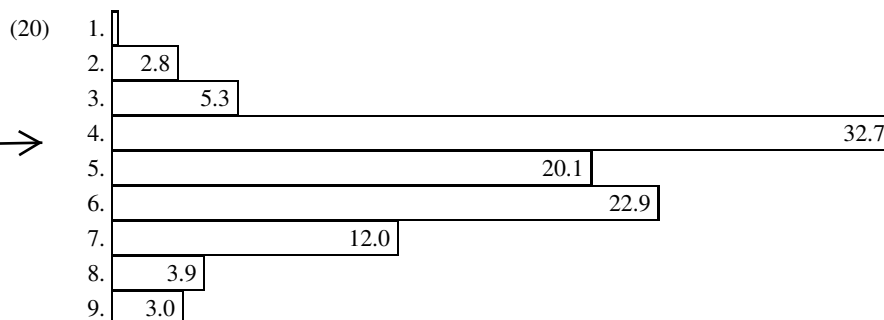
(18) F-RESOLUTION: Two function words (most often a preposition + *the*) can occupy a single Weak position.

- a. His fel/lowship / **in the** cause / against / your city (*TA* 5.2.13)
- b. Ill in / myself / to see, / **and in** thee / seeing ill (*R2* 2.1.94)

Elision, resolution, and extrametricality may be combined to yield feet of four syllables, or even five, as in (19a,b), where the last foot has syncope, W-resolution, and an extrametrical syllable.

- (19) a. And take / my milk / for gall, / you mur/dering **mini**sters (*MAC* 1.5.49)
- b. With a / discovê/ry of / the in/finite **flatte**ries (*TIM* 5.1.36)
- c. What's He/cuba / to him, / or he / to **Hecuba** (*HAM* 2.2.585)
- d. Some griefs / are **medi**/cina/ble; that / is one of them (*CYM* 3.2.33)
- e. To call / for **recompense**. / Appear / it to / your mind (*TC* 3.3.3)

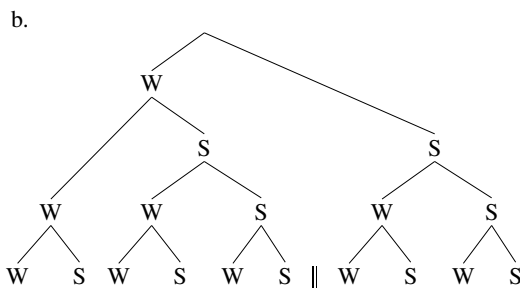
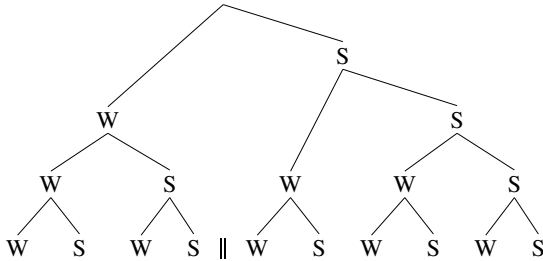
In Shakespeare's blank verse, the feet are most commonly grouped as 2+3, with a caesura after the fourth syllable. (20) (from Keppel-Jones 2001: 234) shows the percentages of caesuras after each position.




This item will be treated as a figure. Please relabel as Figure 2 and renumber subsequent numbered items.

In the later plays, the caesura after the sixth syllable becomes more common (Tarlinskaja 2014: 164). This suggests that the basic structure of Shakespeare's line shifts from (21a) to (21b).¹²

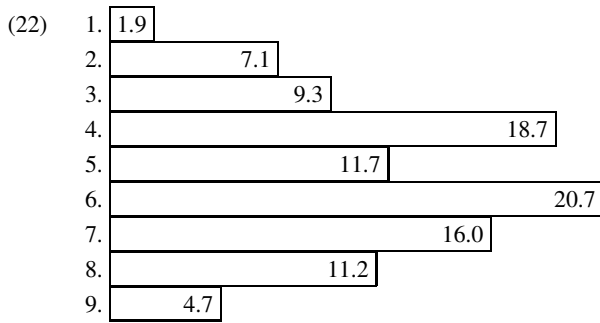
(21)



← Consider relabeling this as a figure.



Varying the placement of the caesura in successive lines is an important feature of verse. In neo-classical iambic pentameter distichs (heroic couplets) a caesura after the fifth position becomes more common. Dividing the line into two constituents of equal size privileges the PARALLELISM constraint, ubiquitous in meter and music (Lerdahl & Jackendoff 1983: 51), over STRICT LAYERING and ALIGNMENT. In the 19th century the caesura shifts still further rightward; Browning favors it after the sixth beat in his early work, see (22),¹³ and after the seventh beat in his later work.



← This item will be treated as a figure. Please relabel as Figure 3 and renumber subsequent numbered items.

¹²The right-branching in (21a) might reflect the general stylistic long-last preference, as in *friends, Romans, countrymen; let her rot, and perish, and be damned to-night; lands and revenues; drawn and ready; soft and delicate* (Ryan 2019).

¹³Percentages, N=321. Based on *My Last Duchess* and *Return of the Druses* (beginning).

The descriptive generalizations outlined here beg for explanations. Why does W-resolution occur only in Strong positions, and F-resolution only in Weak positions? The answer is that W-resolution in Weak positions would violate the Weak position Constraint, which is otherwise strictly obeyed. 23 presents a near-minimal pair that shows the contrast between elision and resolution.

- (23) $\left\{ \begin{array}{l} \text{A sooth/say}^{\widehat{\text{er}}} \\ \text{*A truth/teller} \end{array} \right\}$ bids you / beware / the Ides / of March (*JC* 1.2.19)

Conversely, F-resolution in Strong positions, as in the construct (24b), would introduce a joint violation of both (11a) and (13a).

- (24) a. Whom lep/rosy / o'ertake! — / i' **the midst** / o' **the** fight, (*ANT* 3.10.11)
 b. *Whom lep/rosy / take i' **the** / midst o' **the** / campaign (construct)

Why are lexical stresses of polysyllabic words more restricted than stressed monosyllables? In particular, what makes them less suitable to appear in Weak positions? Lexical stresses of polysyllabic words are more SALIENT than those of monosyllabic words, since they contrast with lexically unstressed syllables within the same word. By the same token, *unstressed syllables* of polysyllabic words are more saliently *unstressed* than those of monosyllabic words, hence even less suited to Strong positions, for they contrast with lexically *stressed* syllables within the same word. These considerations predict a hierarchy of prominence:

- (25) $\acute{\text{P}}$ a stressed syllable in a polysyllabic word (most prominent)
 |
 $\acute{\text{M}}$ a stressed syllable in a monosyllabic word
 |
 $\grave{\text{M}}$ an unstressed syllable in a monosyllabic word (necessarily a function word)
 |
 $\grave{\text{P}}$ an unstressed syllable in polysyllabic word (least prominent)

The following implicational relations are therefore predicted for constraints on metrical Strong and Weak positions (> = 'implies'):

- (26) a. Constraints requiring stress in Strong positions: $\acute{\text{P}} > \acute{\text{M}} > \acute{\text{M}} > \acute{\text{P}}$
 b. Constraints requiring absence of stress in Weak positions: $\acute{\text{P}} > \acute{\text{M}} > \acute{\text{M}} > \acute{\text{P}}$

Variation in English meter provides abundant support for this hierarchy. One example must suffice here: the types of extrametrical syllable permitted in different varieties of English iambic pentameter. The most restrictive system, found in early Marlowe (Schlerman 1989: 200) allows only unstressed syllables of polysyllabic words to be extrametrical, e.g., (27a). In his later work, Marlowe adopts the commoner less restrictive practice of allowing *any* unstressed syllable to be extrametrical, also observed by Shakespeare (see (27b), Schlerman 1989: 202). Shakespeare's plays (but not his sonnets) extend it to secondary stresses of compound words, as in (27c) (Kiparsky 1977). The most unbuttoned of the Jacobean dramatists, such as Fletcher, put stressed full words, occasionally even phrasal peaks, into extrametrical positions (27d).

- (27) a. And sit / with Tam/burlaine / in all / his majest^{ie} (*Tamburlaine* 1.2.209)

- b. I come / to bu/ry Cae/sar, not / to praise **him**. *JC* 3.2.73
- c. Quite o/verca/nopied / with lus/cious wood **bine** (*MND* 2.1.251)
- d. But I / would reach you, / and bring / you to / your trot **too**. (*The Tamer Tamed* 1.3.9)

4. TEXT-SETTING

How is a metrical text fitted to the rhythmic pattern of a song or chant? The expectation is that prosodic features play a role in text-setting to the extent that they are important in meter and phonology. As mentioned above, these prosodic features are not necessarily phonemic, but they must function in the language's lexical phonology. Before proceeding to explore this conjecture, let us consider the relation of silence and phrasing in meter and music.

Structure above the line is in the main organized by two antagonistic constraints, PARALLELISM, which requires dividing a unit into two constituents of equal size, and CLOSURE, which requires making the final unit salient in some way. The normal way of achieving metrical closure is by making the final beat silent, which in song is realized by elongating the last overt one (Blumenfeld 2016).¹⁴ But silent beats have other functions as well, which are of particular interest for the theory of meter.

Let us begin with a simple example of a Hausa verse narrative documented by Schuh (1995). The performer, the popular artist Dan Maraya Jos, accompanying himself on a plucked string instrument, uses three voices, a narrator and two enacted characters, **a woman** and **a fraudulent herbalist**. As the extract in (28) shows, the lines are of variable length, and no regular meter is discernible at first glance (macrons show vowel length, the other diacritics show tone).

(28)	N	Sai kàr ji dai mǎtǎr gidā	Then you hear the woman of the house
	N	Tā canè masà	She says to him
	W	<i>“Wannàn àbu màì sauƙī kùwa</i>	<i>“That’s an easy thing</i>
	W	<i>Bàri zān jē can kò cikin gidā.”</i>	<i>Let me go there to the house.”</i>
	N	Tā kōmá can gidā	She goes back home
	N	Jáwō kwallā, sàyař	Drag out dress clothes, sell them
	N	Jáwō bōkiti mā, sàyař	Drag out buckets too, sell them
	N	Tā tarař tā mīkà kuđin	She finds she hands over the money
	N	An kai wá bōkā nan dà nan	It’s taken to the herbalist immediately
	N	Bōkā ya tattàrē	The herbalist collects it
	N	Bōkā ya handāmē	The herbalist satisfies his desire
	H	“Jē ki, Allāh zāi manà māgānī.”	“Off with you, Allah will be our remedy.”

Once we understand the composition's short lines as having empty metrical positions, its meter is instantly recognizable as regular anapestic tetrameter, a standard meter of Hausa.¹⁵

¹⁴This is consistent with the closure effects mentioned in footnote 12, for there is no reason to posit silent feet in pentameters, and in any case the highest layer of constituency in blank verse is the line, so that putting the shorter hemistich last gains no cohesion over putting the longer one last.

¹⁵Here I diverge from Schuh's (1995) analysis.

(29)	◡	—	◡	—	◡	—	◡	◡
	Sai	kàr	ji	dai	má	taĩ	gi	dā
	Tā ca	nè	masà					
	“Wan	nàn	àbu	mài	sau	kī	kù	wa
	Bàri	zân	jē	can	kò ci	kin	gi	dā”
			Tā	kō	má	can	gi	dā
			Já	wō	kwal	lā,	sà	yaĩ
		Já	wō	bō	kiti	mā,	sà	yaĩ
		Tā ta	raĩ	tā	mī	kà ku	dīn	
	An	kai	wā	bō	kā	nan	dà	nan
			Bō	kā	ya	tat	tà	rē
			Bō	kā	ya	han	dà	mē
	Jē ki	Al	láh	zâi	manà	mā	gà	nī

The performance of the artist is the key to recognizing the meter. *The empty positions in the meter correspond exactly to empty beats in the performance.* After each sequence of missing beats, the singer picks up the regular metrical pattern. The empty beats are obvious from the accompaniment, but can't be parsed from the text alone, so that the meter becomes intelligible only through the performance. The theoretical interest of this example is that it shows the metrical relevance of phonologically unrealized structure. It supports template-matching approaches over the parsing approach of Fabb & Halle 2008 and the “holistic” prosodic approach of Golston & Riad 2002 and Riad 2016. These theories operate on language directly and posit no independent pattern to supply the expectation of the missing beats.

Empty beats challenge bottom-up parsing theories such as Fabb & Halle (2009), since you can't parse what is not there. Their directional parsing algorithm also runs into difficulties in that the lines of this text would have to be scanned *both* left-to-right (for lines ending with empty beats) *and* right-to-left (for lines beginning with empty beats).¹⁶ Secondly, the operations on grids that are their major means of negotiating mismatches cannot generate the short lines because the sequences of empty beats need not be constituents. Lines can begin or end with an odd number of empty beats, including sequences of 3 and 5 beats, which cannot be characterized as groups at any level, whether feet, dipods, or half-lines. But they are easily recognized in performance.

Empty beats also provide compelling arguments for including performance in the province of metrical theory, which Fabb and Halle explicitly reject. It turns out that line-medial empty beats occur just when the singer changes character – a salient event in performance but *not a formal property of the text.*

The prosodic metrical theory of Golston & Riad would probably have to deal with these data by different constraint rankings that output lines of various lengths, in this short sample alone of three, five, six, and seven metrical positions, both left-aligned and right-aligned. This would miss the generalization that lines of *any* length are admissible provided they consist of a subsequence of the eight-syllable anapestic patters.

Empty beats occur in Western art poetry as well.¹⁷ Matthew Arnold's *Dover Beach* dramatizes a speaker expressing his thoughts to a companion as they view the Channel at night. Amidst the poem's

¹⁶Note that it has what Fabb and Halle classify as a strict meter. Loose meters by definition are those which have at least one noniterative “parenthesis insertion” rule, which this meter does not have.

¹⁷There is a famous one in Hopkins' *Spelt from Sibyl's Leaves*.

subtly rhymed regular iambic pentameters are occasional shorter lines of four and three feet, placed to mark significant silences in the represented discourse. I reproduce lines 1–14, inserting ellipses into the text to show where Samuel Barber’s composition (Op. 3) puts in a corresponding break in the short lines. Two such short lines begin the poem, conveying a sense of thoughts emerging from a contemplative silence. At line 8, there is again a missing beat, as the participants listen to the surf.

- (30) ... The sea is calm tonight. ...
 ... The tide is full, the moon lies fair
 Upon the straits; on the French coast, the light
 Gleams and is gone; the cliffs of England stand,
 Glimmering and vast, out in the tranquil bay.
 Come to the window, sweet is the night-air!
 Only, from the long line of spray
 Where the sea meets the moon-blanchèd land,
 Listen! ... you hear the grating roar
 Of pebbles which the waves draw back, and fling,
 At their return, up the high strand,
 Begin, and cease, and then again begin,
 With tremulous cadence slow, and bring
 The eternal note of sadness in. ...

A purely formal analysis of the text as having a meter with variable line length misses the dramatic function of the short lines.

In setting of English poems to music, most composers privilege the natural phonological phrasing, even at the expense of the poem’s lineation and caesuras where they conflict. Phonological prominence also tends to trump metrical prominence, in that stressed syllables, especially of polysyllabic words, are preferentially aligned with Strong musical beats, regardless of whether they fall in Strong or Weak positions in the verse. Weak positions in iambic verse can therefore correspond to Strong musical positions and conversely, especially if the phrasing and natural stress pattern requires it (Halle and Lerdahl 1993).

A simple example is the first quatrain of James Agee’s iambic *Sure on This Shining Night*, which features a rhythmic parallelism of the couplets, with initial inversion in the odd lines.

- (31) Sure on / this shi/ning night
 Of star/-made sha/dows round,
 Kindness / must watch / for me
 This side / the ground.

Samuel Barber’s composition highlights this parallelism, without attempting a close rendering of the metrical foot structure.

- (32) Samuel Barber, *Four Songs*, Op. 13_3

Sure on this shin ing night Of star - made star - made shad -ows round,

This item will be treated as a figure. Please relabel as Figure 4 and renumber subsequent numbered items.



Dell and Halle (2009) show that while English matches stresses to strong musical beats across the board, French does so only at the end of lines, and conversely that French traditional songs require a parallel pairing of syllables to beats in each stanza, which is not the case in English. They propose to derive both differences from the fact that stress in English is perceptually salient throughout the utterance, and only before major breaks in French, and that French meter is basically syllable-counting.

For the rendering of stress and quantity it is difficult to give any general rules. It varies by style and genre even within a language and period. Finnish provides an illustration of this variability. In this language, the primary word stress falls on the initial syllable. Vowel and consonant length is contrastive throughout the word, e.g., *tule* 'come!', *tulee* 'comes', *tuule* 'blow!' (wind), *tuulee* 'blows', *tullee* 'probably comes', *tuullee* 'it is probably windy'. But in singing vowel length can be neutralized by lengthening, and stress can be displaced onto syllables that fall in prominent positions. In the following rendition of a traditional Finnish ballad (the counterpart of *Edward, Edward*), the singers lengthen the stressed open syllables, pronouncing e.g., *túlet* 'you come' as *túulet*.¹⁸

(33) *Velisurmaaja* 'The Fratricide', sung by Niekku. 4/3 ballad meter.

1. ^sMis.täs ^stú.let ^skús.tas ^stú.let, Where are you coming from,
2. ^sPoi.ka.ni ^sí.loi.nén? My cheerful son?
3. ^sMí.e ^stú.len ^smé.ren ^srán.nast, I'm coming from the seashore,
4. ^sMiu ^sái.ti.ni ^skúl.tai.nén. My dear mother.

When an unstressed syllable has to fall on a strong beat, they sometimes shift the word stress onto it, as in line 3 of this verse:

- (34) 1 ^sMíst on ^smiek.kais ^svér.re.hen ^stúl.lu, How did your sword get bloody,
2. ^sPoi.ka.ni ^sí.loi.nén? My cheerful son?
- 3 ^sMíe ta.póin ^svan.hém.man ^svél.jen, I killed my older brother,
4. ^sMiu ^sái.ti.ni ^skúl.tai.nén. My dear mother.

Native Finnish meters are ingeniously adapted to the coexistence of phonemic vowel length and initial stress so as to jointly optimize variety and phonological faithfulness. The *Kalevala* meter consists of eight-syllable lines made up of four trochaic (Strong–Weak) feet, with obligatory alliteration and parallelism. The basic metrical rule is that a stressed (=word-initial) syllable must be \sim in Weak positions, and $-$ in Strong positions ($\sim = C\check{V}$). This avoids lengthening of vowels in the sensitive first syllable, which would neutralize the most important site of the length contrast. The resulting mismatches between stress and metrical positions in words with an odd number of syllables create the main rhythmic excitement of this meter.

¹⁸<https://www.youtube.com/watch?v=NwAcHcuYzL4>

In the rendition by Niekku, the singers foreground the tension between phonology and meter by resolving it differently in repetitions of lines 1 and 3. They sing them once with the original word stress, and the second time they shift the word stress to the syllable that falls on the metrical stress, in each case with lengthening of some of the stressed vowels.¹⁹

- (35) a1. $\overset{s}{E}i \overset{s}{p}i.\overset{s}{t}ai.\overset{s}{s}i \overset{s}{n}u.o.\overset{s}{r}en \overset{s}{n}e.i.\overset{s}{e}n$ A young girl shouldn't
 a2. $\overset{s}{E}i \overset{s}{p}i.\overset{s}{t}ai.\overset{s}{s}i \overset{s}{n}u.o.\overset{s}{r}en \overset{s}{n}e.i.\overset{s}{e}n$ A young girl shouldn't
 b. $\overset{s}{V}as.ta.\overset{s}{kas}.va.\overset{s}{van} \overset{s}{ka}.na.\overset{s}{sen}$ A chick still growing
 c1. $\overset{s}{U}s.ko.\overset{s}{a} \overset{s}{u}.ron \overset{s}{sa}.no.\overset{s}{ja}$ Trust the words of a male
 c2. $\overset{s}{U}s.ko.\overset{s}{a} \overset{s}{u}.ron \overset{s}{sa}.no.\overset{s}{ja}$ Trust the words of a male
 d. $\overset{s}{M}ie.hen \overset{s}{vals}.kin \overset{s}{van}.non.\overset{s}{noi}.ta$ The promises of a cheating man

In general, distinctive quantity seem to be reflected more faithfully in text-setting than stress is (Hayes 2016). Since syllable weight is the only active prosodic feature in the lexical phonology of Urdu (or at least by far the most important one), and its meters are also based on weight, good singers take care to preserve it. Begum Akhtar's ghazal renderings respect syllable weight in so far as possible while maintaining Urdu's phonemic vowel length contrast, even at the cost of some compromises in the syllable count. Metrically prominent positions are sung as bimoraic. In words like *gul* 'rose', this is done by extending the note over the vowel and the sonorant coda. Words like *sab* 'all' are bimoraic and occupy heavy positions in the meter, but their closing obstruent cannot carry a note, nor can the phonemically short vowel be lengthened lest the length contrast is lost. In positions that require a heavy syllable, such words are sung with final -ə inserted as a last resort, which allows their heavy syllables that have only one singable mora to fill the musical space allotted to them. In this system, faithfulness to syllable weight trumps faithfulness to the syllable count.²⁰

The investigation of text-to-tune alignment in cross-linguistic perspective is only beginning, but preliminary results already indicate that the negotiation of phonology and meter in song provides a sensitive probe into the prosodic organization of language.

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LITERATURE CITED

- Attridge D. 1974. *Well-weighed syllables: Elizabethan verse in classical metres*. Cambridge: Cambridge University Press
- Beissinger MH. 2012. Oral Poetry. In *The Princeton encyclopedia of poetry and poetics*, ed. Greene Roland, Stephen Cushman, pp. 978–81. Princeton and Oxford: Oxford University Press. [Accessible online].

¹⁹ *Suomen kansanmusiikki 1* (Folk Music of Finland 1), Kansanmusiikki-instituutti 1988.

²⁰ A fine example is Begum Akhtar's rendering of Ghalib's *Sab Kahan Kuch Lala-o-Gul Mein*, <https://www.youtube.com/watch?v=0wgg6H8Qxo>

- Blumenfeld L. 2015. Meter as faithfulness. *NLLT* 33:79–125
- Blumenfeld L. 2016. End-weight effects in verse and language. *Studia Metrica Poetica* 3(1):7–32
- Borgeson Scott, Arto Anttila, Ryan Heuser, Paul Kiparsky. *Antimetricality*. To appear
- Dell F, Elmedlaoui M. 2008. *Poetic meter and musical form in Tashlhiyt Berber songs*. Köln: Rüdiger Köppe
- Dell F, Halle J. 2009. Comparing musical textsetting in French and in English songs. In *Towards a Typology of Poetic Forms: From language to metrics and beyond*, ed. Jean-Louis Aroui, Andy Arleo, pp. 63–78. Amsterdam: Benjamins
- Deo AS. 2007. The metrical organization of classical Sanskrit verse. *J. Linguist.* 43(1):63–114
- Fabb N, Halle M. 2008. *Meter in poetry: A new theory*. Cambridge: Cambridge University Press
- Golston C, Riad T. 2000. The phonology of Classical Greek meter. *Linguistics* 38:99–167
- Halle J, Lerdahl F. A generative textsetting model. *Curr. Musicol.* 55:3–23
- Hanson K, Kiparsky P. 1996. A parametric theory of poetic meter. *Language* 72:287–335
- Hanson K, Kiparsky P. 1997. The nature of verse and its consequences for the mixed form. In *Prosimetrum: Cross-cultural perspectives on narrative in prose and verse*, ed. J Harris, T Ziolkowski. Cambridge: Brewer
- Hanson K. 2006. Shakespeare's lyric and dramatic metrical styles. In *Formal approaches to poetry*, ed. Bezalel Elan Drescher, Nila Friedberg, pp. 111–33. Berlin: Mouton de Gruyter
- Hayes B. 1989. The prosodic hierarchy in meter. In *Phonetics and phonology. I. Rhythm and meter*, ed. Paul Kiparsky, Gilbert Youmans, pp. 201–60. San Diego: Academic Press
- Hayes B. 2009. Textsetting as constraint conflict. In *Towards a Typology of Poetic Forms: From language to metrics and beyond*, ed. Jean-Louis Aroui, Andy Arleo, pp. 43–61. Amsterdam: Benjamins
- Herder JG. 1768. Fragmente. In *Sprachphilosophische Schriften*, ed. Erich Heintel, 1960. Hamburg: Meiner
- Hollander J. 1985. Observations in the art of English quantity. In *Vision and resonance*. 2nd edn. New Haven: Yale University Press
- Itô J, Mester A. 2003[1992]. Weak layering and word binarity. In *A new century of phonology and phonological theory: A festschrift for professor Shosuke Haraguchi on the occasion of his sixtieth birthday*, ed. Takeru Honma, et al., pp. 25–65. Tokyo: Kaitakusha
- Kahn D. 1976. Syllable-based generalizations in English phonology. MIT Dissertation. <http://hdl.handle.net/1721.1/16397>. Reprinted 2015 in Routledge Library Editions: The English Language.
- Keppel-Jones D. 2001. *The strict metrical tradition: Variations in the literary iambic pentameter from Sidney and Spenser to Matthew Arnold*. McGill-Queen's University Press
- Kiparsky P. 1977. The rhythmic structure of English verse. *Linguist. Inq.* 8(2):189–247
- Kiparsky P. 1989. Sprung rhythm. In *Phonetics and phonology. I. Rhythm and meter*, ed. Paul Kiparsky, Gilbert Youmans, pp. 305–40. San Diego: Academic Press

- Kiparsky P. 2006. A modular metrics for folk verse. In *Formal approaches to poetry*, ed. Bezalel Elan Drescher, Nila Friedberg, pp. 7–49. Mouton: Hague
- Kiparsky P. 2007. Iambic inversion in Finnish. In *A Man of Measure: Festschrift in Honour of Fred Karlsson on his 60th Birthday*, ed. Mickael Suominen, et al., pp. 138–48. Turku: The Linguistic Association of Finland, 2006.
- Kiparsky P. 2018a. Formal and empirical issues in phonological typology. In *Phonological Typology*, ed. Larry Hyman, Frans Plank. Berlin: de Gruyter Mouton, 2018.
- Kiparsky P. 2018b. Indo-European origins of the Greek hexameter. In *Sprache und Metrik*, ed. Dieter Gunkel, Olav Hackstein. Leiden/Boston: Brill
- Lerdahl F, Jackendoff R. 1983. *A generative theory of tonal music*. Cambridge: MIT Press
- Lieberman M, Prince A. 1977. On stress and linguistic rhythm. *Linguist. Inq.* 8:249–336
- Prince AS. 1983. Relating to the grid. *Linguist. Inq.* 14(1):19–100
- Riad T. 2016. The meter of Tashlhiyt Berber songs. *Nat. Lang. Linguist. Theory*
- Ryan K. 2017. The stress-weight interface in metre. *Phonology* 34(3):581–613
- Ryan KM. 2019. Prosodic end-weight reflects phrasal stress. *Nat. Lang. Linguist. Theory* 37:315–56
- Saintsbury G. 1906–10. *A history of English prosody from the twelfth century to the present day*. 3 vols. London: Macmillan
- Schlerman BJ. 1989. *The meters of John Webster*. New York: Peter Lang
- Steele T. 1999. *All the fun's in how you say a thing*. Athens: Ohio University Press
- Tarlinskaja M. 2014. *Shakespeare and the versification of English drama 1561–1622*. Farnham: Ashgate
- West ML. 1982. *Greek metre*. Oxford: Clarendon
- Wilamowitz-Möllendorff Uv. 1921. *Griechische Verskunst*. Berlin: Weidmann
- Zec D. 2009. The prosodic word as a unit in poetic meter. In *The Nature of the Word: Essays in Honor of Paul Kiparsky*, ed. K Hanson, S Inkelas. Cambridge, MIT Press