VOWEL-TO-VOWEL INTERVALS IN THE QUANTITATIVE METERS OF A.GREEK AND LATIN

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The slides can be found, in compressed and uncompressed versions, here:

https://linguistics.mit.edu/user/steriade/__

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The puzzle

Certain V(C) word finals are avoided some contexts in the quantitative meters of Greek and Latin

Avoided word finals: under-attested or banned overall

(a) $\breve{V}$#CV	(b) $\breve{V}$#CCC$_0$V	(c) $\breve{V}$C#CC$_0$V

$\breve{V}$ short V

Word finals that are not avoided:

(d) $\breve{V}$C#V	(e) $\breve{V}$CC#C$_0$V	(f) $\bar{V}$C$_0$#C$_0$V

$\bar{V}$ long V, or diphthong

1. Introduction to intervals

The basics (1)

- V-to-V intervals are units of rhythm.
- Proposed as substitutes for syllables
- Each interval is a nucleus (V, VV, C̩) plus an *entire* C_0 interlude, up to next nucleus, | VC_0 | V, or up to pause, | VC_0 | ##.
- ‘ | ’ interval boundary.
- *interval* parsed | ɪnt | ɝv | əl |
- *syllable* parsed $_s$ | ɪl | əb | l̩ |
- C_0|VC_0|VC_0| instead of .C_0VC_0.C_0VC_0.

The basics (2)

- Intuitive word divisions, e.g. *in.ter.val*, **int.erv.al*, are not interval-based

  Claim: such divisions reflect a preference to preserve intact the CV transitions of undivided form, e.g. [ɪn̲t̲ə̲ɹv̲ə̲l], in the corresponding isolated fragments [ɪn],[t̲ə̲ɹ],[v̲ə̲l].

  (on CV transitions as main cues to C identity Fujimura et al. 1978; Ohala 1990; on their effect on intuitions of syllable division, Steriade 1999).

- Preference to preserve CV transitions is unrelated to the units of rhythm; and it's enforced independently of these units.

  (CV transitions/CV-units tend to be preserved even when separated from corresponding weight units: Hombert 1986 on CV swapping in Bakwiri 'backwards talk', e.g. lùùŋá → ŋààlú.)

The basics (3)

- Arguments for intervals: Sturtevant 1922; Farnetani & Kori 1996; McCrary 2006; Barbosa 2007; Steriade 2009, 2012, 2019; Hirsch 2010; Guilherme-Garcia 2015; Seifart & al. 2017; Ryan 2022; others
- The Greek grammarians' statements on weight presuppose intervals: 'a short vowel is heavy by position if followed by [at least] two Cs,' **not** '…if followed by a C in its syllable'.

  Dionysius Thrax (2nd BC; Uhlig 1883: I, 1, 18,4—19.1)
- Latin grammarians: VCC_0 is unit of weight, distinct from syllable

  Quintilianus Inst. Or. (2nd AD): 9,4,85-86. Pompeius (5th AD), as cited in Marotta 2015:73

Intervals are like syllables, except

1. Intervals have no (need for) internal constituents.

   Syllables need Onset + Rime to compute weight.

2. All segments in an interval contribute to its weight (Ryan 2019, Steriade 2012).

   Syllables exclude Onsets.

3. An interval's boundaries are invariably placed: $|VC_0|V$

   Syllables: VCCV is parsable as V.CCV, VC.CV.

Weight categories

- Weight is a continuum (Gordon 1999, Ryan 2012):

  V > VC > VCC > VV…

- Weight categories like Light/Heavy (L/H) are regions in it.

Weight categories

- Latin stress and meter refer to a L/H distinction.

  With syllables, we must draw the line at V vs. VC rimes:

	C_0V	**C_0VC**	**C_0VCC**	**C_0VV**	**…**
σ	lí.**be**.rō	li.**bér**.tō	suf.**férc**.tō	I.**bḗ**.rō	
	L	H			

$\bar{V}$ = long V
V or $\breve{V}$ = short V

liberō ‘I liberate’; *libertō* ‘freed-man-DatSg’; *sufferctō* ‘stuffed-DatSg’; *Ibērō* ‘Iberian-DatSg’

Weight categories

- Latin stress and meter refer to a L/H distinction.
- With intervals, we must draw the line at VC vs. VCC:

	VC	**VCC**	**VCCC**	**VVC**	**…**
I	líb|**er**|ō	lib|**ért**|ō	s|uff|**érct**|ō	Ib|**ēr**|ō	
	L		H		

Weight categories

- With intervals, a further Light (L) vs. Extra-Light (Ľ) distinction

	V	**VC**	**VCC**	**VVC**	**…**
I	d|ir|íb|**e**|ō	l|íb|**er**|ō	l|ib|**ért**|ō	Ib|**ēr**|ō	
	Ľ	L	H		

diribeō ‘I divide’

V (Ľ)-intervals vs. VC (L)-intervals: Steriade 2019

2. Weight changes: isolation vs. phrase-medial

Quantitative meters: e.g. dactylic hexameter

dactyls	¯	˘	˘	¯	˘	˘	¯	˘	˘	¯	˘	˘	¯	˘	˘	¯	˘	˘	¯	˘	˘	¯	π
spondees	¯	¯		¯	¯		¯	¯		¯	¯		¯	¯		¯	¯		¯	¯		¯	π

¯ = Heavy, ˘ = Light, π = an unrestricted position

	Isolation	before #V	before #CV	before #CCV
	V#	V#V	V#CV	V#CCV
Weight of π_1		Light	Light	Heavy
E.g.	arma	arma et	arma virum	arma stant

arma 'weapons', *et* 'and, *virum* 'man-AccSg', *stant* 'are standing'

	Isolation	**before #V**	**before #CV**	**before #CCV**
	V#	V#V	V#CV	V#CCV
Weight of π_1		Light	Light	Heavy
E.g.	arma	arma et	arma virum	arma stant
	VC#	VC#V	VC#CV	VC#CCV
Weight of π_1		Light	Heavy	Heavy
E.g.	ater	ater et	ater canis	ater stat

ater 'black', *et* 'and, *canis* 'dog-NomSg', *stat* 'is standing'

Syllables	**Isolation**	**before #V**	**before #CV**	**before #CCV**
	V#	V#V	V#CV	V#CCV
Weight of π_1	Light	Light	Light	Heavy
E.g.	arma	arma. et	ar.ma. vi.rum	ar.mas.tant

Resyllabification, weight change: ar.**ma**. stant → ar.**mas**.tant; basic Light becomes a Heavy

Syllables	**Isolation**	**before #V**	**before #CV**	**before #CCV**
	VC#	VC#V	VC#CV	VC#CCV
Weight of π_1	Heavy	Light	Heavy	Heavy
E.g.	ater	ate.r et	ater. canis	ater. stat

Resyllabification, weight change: a.**ter**. et → a.**te**.ret; basic Heavy becomes a Light

All weight changes are caused by specific Markedness-Faithfulness rankings
e.g. *SC ONSETS >> *CODA >> FAITH WEIGHT (Steriade 2009).

Intervals	**Isolation**	**before #V**	**before #CV**	**before #CCV**
	V#	V#V	V#CV	V#CCV
Weight of π_1	ExtraLight	ExtraLight	Light	Heavy
E.g.	arm|a	arm|a|et	arm|av|ir|um	arm|ast|ant

arm|a + st|ant → arm|ast|ant: Isolation ExtraLight (V) → Heavy (VCC) before CC

Intervals	**Isolation**	**before #V**	**before #CV**	**before #CCV**
	VC#	VC#V	VC#CV	VC#CCV
Weight of π_1	Light	Light	Heavy	Heavy
E.g.	at|er|	at|er|et	at|erc|an|is	at|erst|at

at|er + c|an|is → at|erc|an|is: isolation Light (VC) becomes Heavy VCC

at|er + st|at → at|erst|at: isolation Light (VC) becomes Heavy VCCC

Intervals	**Isolation**	**before #V**	**before #CV**	**before #CCV**
	V#	V#V	V#CV	V#CCV
Weight of π_1	ExtraLight	ExtraLight	Light	Heavy
E.g.	arm|a	arm|a|et	arm|av|ir|um	arm|ast|ant

arm|a+ v|ir|um→ arm|av|ir|um: isolation ExtraLight (V) becomes Light (VC)

Intervals	**Isolation**	**before #V**	**before #CV**	**before #CCV**
	VC#	VC#V	VC#CV	VC#CCV
Weight of π_1	Light	Light	Heavy	Heavy
E.g.	at|er|	at|er|et	aterc|an|is	at|erst|at

No weight change: a|ter|+ et → at|er|et; isolation Light (VC) interval remains a Light

Predictions summarized:

different weight changes with syllables vs. intervals

syllables

			in context	_#V	_#CV	_#CCV
in isolation	L	V#	V.#V	V.#CV	L → H V#C.CV	
	H	VC#	H → L V.C#V	VC.#CV	VC.#CCV	
	H	VCC#	VC.C#V	VCC.#CV	VCC.#CCV	
	H	V̄#	V̄.#V	V̄.#CV	V̄#C.CV	
	H	V̄C#	V̄.C#V	V̄C.#CV	V̄C.#CCV	

intervals

			in context	_#V	_#CV	_#CCV
in isolation	Ľ	V#	V|#V	Ľ → L V#C|V	Ľ → H V#CC|V	
	L	VC#	VC|#V	L → H VC#C|V	Ľ → H VC#CC|V	
	H	VCC#	VCC|#V	VCC#C|V	VCC#CC|V	
	H	V̄#	V̄|#V	V̄#C|V	H: V̄#CC|V	
	H	V̄C#	V̄C|#V	V̄C#C|V	H: V̄C#CC|V	

4. Testing the predictions

Quantitative meters test these different predictions

- Some word final V̆(C)# sequences are avoided in some contexts.

1.	(a) V̆#CV	(b)V̆#CCV	(c)V̆C#CV	(d) V̆C#V	(e)V̆CC#C_0V	(f) V̄C_0#C_0V
2.	L π	H π	H π	L π	H π	Hπ

- (a), (b), (c): restricted or impossible in A.Greek and Latin poetry.
- E.g. Vergil: (b) is impossible in all positions for s-stop clusters.
  (a), (c) are very rare when a foot boundary coincides with #.
- (d), (e), (f): unrestricted for all classical poets, in all metrical contexts, all periods.

Changes of interval weight relative to isolation weight

1.	(a) V̆#C|V	(b)V̆#CC|V	(c)V̆C#C|V	(d) V̆C|#V	(e)V̆CC#C_0|V	(f) V̄C_0#C_0|V
2.	Lπ	Hπ	Hπ	Lπ	Hπ	
3.	L̆	L̆	L	L	H	

Weight of the word-final interval in isolation

Weight of the word-final interval in line medial context:
the weight changes, relative to isolation, in (a-c); it doesn't change in (d-f)

Interval-based hypotheses about these V̆(C)#restrictions

(a) V̆#C|V	(b)V̆#CC|V	(c)V̆C#C|V	(d) V̆C|#V	(e)V̆CC#C_0|V	(f) V̄C_0#C_0|V
Lπ	Hπ	Hπ	Lπ	Hπ	
L̆	L̆	L	L	H	

- Restricted finals (V̆(C)#): their weight *can* increase, L̆ to L, L̆/L to H
- Unrestricted finals (V̆CCC$_0$#, V̄C$_0$#) are already H, their weight can't increase

Interval-based hypotheses about these V̆(C)#restrictions

(a) V̆#C|V	(b)V̆#CC|V	(c)V̆C#C|V	(d) V̆C|#V	(e)V̆CC#C_0|V	(f) V̄C_0#C_0|V
Lπ	Hπ	Hπ	Lπ	Hπ	
L̆	L̆	L	L	H	

- Restricted finals (V̆(C)#): their weight *can* increase, L̆ to L, L̆/L to H
- Unrestricted finals (V̆CCC$_0$#, V̄C$_0$#) are already H, their weight can't increase
- Restricted contexts (_#C): those that *can* change weight of preceding intervals.
- Unrestricted context (_ #|V), as in (d): those that can't add anything to an interval, so they can't increase its weight category.

An interval-based constraint class:
Penalize any increase in the weight of an interval relative to the weight of its counterpart in the isolation form.

(a) V̆#C|V	(b)V̆#CC|V	(c)V̆C#C|V	(d) V̆C|#V	(e)V̆CC#C_0|V	(f) V̄C_0#C_0|V
Lπ	Hπ	Hπ	Lπ	Hπ	
L̆	L̆	L	L	H	

Syllable accounts don't draw the right distinction

(a) V̆.#CV	(b)V̆#C.CV	(c)V̆C.#CV	(d) V̆.C#V	(e)V̆CC#C_0V	(f) V̄C_0#C_0V
Lπ	Hπ	Hπ	Lπ	Hπ	
L	L	H	H	H	

Sequences (a) and (c) preserve isolation σ–weight category, but are avoided. (d) changes its σ–weight category, but is preferred to (a), which preserves σ–weight

Alignment of word to σ-boundaries? It doesn't distinguish avoided from preferred: violated in (b), (d) and instances of (e-f). Satisfied in (a), (c) and other cases of (e-f).

5. The evidence, part 1: V̆CV strings across a boundary

V̆C#V (e.g. dīrig**it e**t) vs. V̆#CV (e.g. dīrig**e se**d)

HLL HLL

Changes of weight predicted by each theory

syllables

	in context	_#V	_#CV	_#CCV
in isolation: L	V#	V.#V	V.#CV	L → H: V#C.CV
in isolation: H	VC#	H → L: V.C#V	VC.#CV	VC.#CCV
in isolation: H	VCC#	VC.C#V	VCC.#CV	VCC.#CCV
in isolation: H	V̄#	V̄.#V	V̄.#CV	V̄#C.CV
in isolation: H	V̄C#	V̄.C#V	V̄C.#CV	V̄C.#CCV

dī.ri.g**i.t** #**e**t
H L L

Basic H→L

intervals

	in context	_#V	_#CV	_#CCV
in isolation: Ľ	V#	V|#V	Ľ → L: V#C|V	Ľ → H: V#CC|V
in isolation: L	VC#	VC|#V	L → H: VC#C|V	Ľ → H: VC#CC|V
in isolation: H	VCC#	VCC|#V	VCC#C|V	VCC#CC|V
in isolation: H	V̄#	V̄|#V	V̄#C|V	H: V̄#CC|V
in isolation: H	V̄C#	V̄C|#V	V̄C#C|V	H: V̄C#CC|V

dīr|ig|**e #s|e**d
H L L

Basic Ľ→L

Soubiran's Law (Soubiran 1955)

- Words placed at the end of a dactyl tend to end in V̆C#

	Foot n	Foot n+1		
	– ˘ ˘	…		
a.	… V̆C#	V …	**dīrigit et** preferred,	esp. when # coincides with a punctuation mark
b.	… V̆#	CV…	**dīrige sed** dispreferred	

In Greek, this law holds strongly for Theocritos, Callimachos; mildly for Homer. In Latin, it begins to hold with Vergil, to a significant extent.

Soubiran's Law confirms the predictions of the interval analysis.

Soubiran's Law (Soubiran 1955)

- Words placed at the end of any dactylic foot tend to end in V̆C

	Foot n	Foot n+1	
	– ◡ ◡	…	
a.	… V̆C#	V …	Preferred, esp. at major phrasal break
b.	… V̆#	CV…	Dispreferred, esp. at major break
c.	… V̆CC$_0$#	CV …	unmetrical H at end of dactyl
d.	… V̄C$_0$#	(C)V …	

Vergilian examples

- Common between dactyl and next foot: V̆C#V

1. **Constitit**, **e**t lacrimans, "Quis jam locu**s**" **i**nquit "Achātes" (Aen.1.459)

[H L L]$_4$ [H L L]$_4$ [H L L]$_5$ [H π]$_6$

- Less common, in same context: V̆#CV

2. Perge mod$^{\Theta}$ et, quā tē dūcit vi**a, d**īrige **gr**essum. (Aen.1, 401)

[H L L]$_4$ [HL L]$_5$[H π]$_6$

1. Transl. *He paused and, tearing up, said: "Achates, what place now"*

2. Transl. *Only press on and direct your step where the route leads you.*

Soubiran's Law in Vergil's Aeneid

Counts from Soubiran 1955, songs IV-VI (2476 lines)

	Foot 4 | Foot 5	Major phrasal break	Word boundary
	– ◡ ◡ | …		
a.	… v̆C# | V …	113	119
b.	… v̆# | CV…	31	141
Rate of v̆C#V at end of all dactyls in ft 4, where Soubiran looked:		78%	46%

Counts in Aeneid song 1 (751 lines)

	Foot 4	Foot 5	Punctuation break	Word boundary no punctuation
	– ˘ – ˘	…		
a.	… V̆C#	V …	15	52
b.	… V̆#	CV…	1	34
Rates of V̆C#V at end of all dactyls between ft 4 and ft 5:			94%	60%

Punctuation break: when a punctuation mark **{, ; : “ ”.}** intervenes between the last V in foot 4 and the first V in foot 5.

Some Aeneid 1 lines with C#V between ft 4 and 5

circum cl•austra frem•unt; cels•a **sedet•** Aeolus•_arce	C#V
impulit• in latus• ac vent•i, **velut•** agmine_f•acto,	C#V
Intonu•ere pol•~~i~~, et crebr•is **micat•** ignibus•_aether,	C#V
saevus ub•~~i~~-Aeacid•ae tel•o **jacet** H•ector,_ub•~~i~~-ingens	C#V
terr~~am~~ int•er fluct•us aper•it; **furit•** aestus_har•enis,	C#V
torquet ag•ens circ•~~um~~, et rapid•us **vorat•** aequore_v•o	C#V
Disject•~~am~~-Aene•ae, tot•o **videt•** aequore_cl•assem,	C#V
detrud•unt nav•is scopul•o; **levat•** ipse_trid•enti;	C#V
iamque fac•es et s•axa vol•ant—**furor•** arma_min•istrat;	C#V
efficit•object•u later•um, **quibus•** omnis_ab•_alto	C#V
desuper• horrent•ique atr•um **nemus•** imminet•_umbra,	C#V
ulla ten•ent, unc•o non **•alligat•** ancora_m•orsu,	C#V
aut Capyn•, aut cels•is in **p•uppibus•** arma_Ca•ici,	C#V
"O soci•i—neque en•~~im~~ ignar•i **sumus•** ante_mal•orum	C#V
O pass•i gravi•ora, dab•it **deus** h•is_quoque_f•inem,	C#V
Et iam f•inis er•at, cum **I•uppiter•** aethere_s•ummo	C#V

Last word in foot 4 **highlighted**

• = foot boundary at interval boundary

<h> marks a voiceless V, not a C:

<jacet Hector> = j|ak|et|e̥kt|or|

Aeneid 1 lines with C#,V punctuation after foot 4

	foot 4	end foot 4	punctuation
quale man●us add●unt ebor●i **decus,●** aut ubi fl●avo	D	C#V	comma
Est in s●ecess●u long●**o locus:●** insula p●ortum	D	C#V	colon
mortal●is, nec v●ox homin●**em sonat●:** O, dea c●erte—	D	C#V	colon
sic cunct●us pelag●i cecid●**it fragor●,** aequora p●ostquam	D	C#V	comma
prospec●um lat●e pelag●**o petit, ●**Anthea s●i quem	D	C#V	comma
Teucror●~~um~~, et gent●i nom●**en dedit●,** armaque f●ixit	D	C#V	comma
omnibus● exhaust●os jam c●**asibus,●** omni~~um~~ eg●enos,	D	C#V	comma
haeret et● interd●um gremi●**o fovet,●** inscia D●ido,	D	C#V	comma
Adsit l●aetiti●ae Bacch●**us dator●,** et bona J●uno;	D	C#V	comma
Quos int●er medi●us ven●**it furor●.** Ille Sych●aeum	D	C#V	period
Constitit●, et lacrim●ans, "Quis j●**am locus"●** inquit "Ach●ate,	D	C#V	quote
hinc atqu~~e h~~●inc glomer●antur or●**eades; ●**illa phar●etram	D	C#V	semicolon
insid●at quant●us miser●**ae deus●;** at memor● ille	D	C#V	semicolon
Perge mod●~~o~~, et, qua t●e duc●**it via, d●**irige gr●essum."	D	V#C	comma
et ver●~~a~~ incess●u patu●**it dea.●** Ille ubi m●atrem	D	V#V	period

Extension: *all* dactyls followed by *any* punctuation mark

	C#V	V#C	V#V	totals
?! marks	3	0	2	5
semi-colon	12	1	1	14
colon	6	1	0	7
period	1	1	0	2
comma ft 1	22	8	8	38
comma ft 4	14	1	0	15
comma ft 5	1	1	0	2
				83
% from total	71%	16%	13%	(Aen. Song 1)

V̆C#V preferred to V̆#CV at all post-dactyl punctuation breaks.
Also: there is no context where V̆#CV is preferred to V̆C#V.

Aeneid 1's lines with semicolon after a dactyl, in any foot

	foot	juncture	punctuation
dat latus;● insequit●ur cumul●o prae-r●uptus_aq●uae_mons.	1	C#V	semicolon
Sic Venus●; et Vener●is contr●a sic f●ilius_●orsus:	1	C#V	semicolon
occulit●; ipse un●o gradit●ur comit●atus Ach●ate,	1	C#V	semicolon
dispulit; h●uc pauc●i vestr●is ad-n●avimus●_oris.	1	C#V	semicolon
non metus●; offici●o nec t●e cert●asse pri●orem	1	C#V	semicolon
vocibus;● et vere●or, quo s●e Iun●onia v●ertant	1	C#V	semicolon
lora ten●ens tamen; h●uic cerv●ixque com●aeque trah●untur	2	C#V	semicolon
ex numer●o subit●; ac magn●o tell●uris am●ore	2	C#V	semicolon
volvitur● in caput●; ast ill●am ter fl●uctus_ib●idem	2	C#V	semicolon
hic curr●us fuit; h●oc regn●um dea g●entibus●esse.	2	C#V	semicolon
hinc atque ~~h~~●inc glomer●antur or●eades; ●illa_phar●etram	4	C#V	semicolon
insid●at quant●us miser●ae deus●; at_memor●_ille	5	C#V	semicolon
atria; d●epend●ent lychn●i laque●aribus●aureis	1	V#C	semicolon
hospitia~~;~~ h●aud tant●o cess●abit c●ardine_r●erum.	1	V#V	semicolon
corda vol●ente de●e; in prim●is reg●ina qui●etum	2	V#V	semicolon

Most feet, especially foot 1, allow post-dactyl breaks.
Soubiran's Law holds here:
12/15 with VC#V juncture,
1 with C#V juncture;
2 with V#V: coalescence.

Significance: Soubiran's Law is not about foot 4, but about any *post-dactyl* breaks.

An interval interpretation of Soubiran's law

Weight Correspondence: Isolation-to-Metrical Line, foot-final

(WEIGHTCORR I-M,]Φ)

> If an interval is final in a phonological phrase (e.g. before punctuation)
> *and* final in a foot (e.g. at the end of a dactyl),
> *then* its isolation weight is identical to its line-medial weight.

Structures permitted by WEIGHT CORR

- Constitit, et lacrimans, "Quis iam locu**s**" | **i**nquit "Achātes (Aen.1.459)
  [H L L]$_4$ | [H L L]$_5$[H π]$_6$

  Permitted by WEIGHTCORR:

  locus is LL in isolation — End of foot (& meter, colon)

  also LL before this end of colon/phrase — End of phrase / End of interval

- Sic Venu**s** | ; **e**t Veneris contra sic filius orsus (Aen 1,325)
  [H L L]$_1$ [H L L]$_{2...}$ (transl: Thus spoke Venus, and her son replied thus)

  Venus is LL in isolation

  also LL before this end of foot/phrase

Structures penalized by WEIGHT CORR

- Perge modo et, qua te dūcit **viă, d**|īrige gressum (Aen.1. 387)

$$[\mathrm{H\ L\ L}]_4[\mathrm{H\ L\ L}]_5\ [\mathrm{H}\ \pi]_6$$

End of word/phrase End of interval and foot

- **viă** ends in Ĭ in isolation, but becomes L when placed before **d**īrige .
- **d**īrigĕ ends in Ĭ in isolation, but becomes L when placed before **gr**essum.

Could the V̆C#V preference in Soubiran's Law be due to a hypothetical preponderance of #V-initial words?

Not likely, but there is data.

Lexical/text frequencies of #C-initial and #V-initial words vs. #V-initial words after a word-final dactyl

- Prose text frequencies estimated from Caesar's *De Bello Gallico*
- Lexical frequencies estimated from Perseus.tufts.edu counts

	V-initial	C-initial	total	**% V-initial**
Prose text freq	2620	5191	7811	**34%**
Dictionary freq	14,386	37,726	52,112	**28%**
After 4th foot dactyl	(Soubiran's Vergil IV-VI data)			**78%**
After any dactyl + punctuation	(my Vergil I counts)			**82%**

Over-represented #V-initials after dactyls can't be attributed to the frequency of V-initial words in Latin; in either dictionary, or non-poetic speech.
Rather, Vergil is using #V-initials to satisfy a text-to-meter constraint, Weight-Corr.

Significance of WEIGHT CORR

- Preference for VC#V vs. V#CV is predicted by interval representations plus the general preference to preserve *any* properties of the basic form, including weight.

Interval weight is preserved.

Predicting aspects of WEIGHT CORR

- Why is the preference to preserve weight expressed *foot finally*?

  General preference to *preserve rhythmic structures at the end of metrical constituents*, more so than in other contexts (Kiparsky & Youmans 1989 passim, and below). But weight is preferably preserved elsewhere too.

Predicting aspects of WEIGHT CORR

- Why is the preference limited to *end-of-dactyl* positions?
- It isn't. WEIGHT CORR applies generally, but spondees end in a Heavy π so the junctures it prefers at end of spondees will be different.

  When V̆ occurs in a spondee-final H interval, WEIGHT CORR predicts restrictions on V̆C#C|V and V̆#CC|V. Confirmed (Appendix 2).

6. Summary

Compare interval and syllable accounts
of metrical restrictions on $\breve{V}CC_0V$ across boundaries

(a) $\breve{V}$#CV	(b)$\breve{V}$#CCV	(c)$\breve{V}$C#CV	(d) $\breve{V}$C#V	(e)$\breve{V}$CC#C_0V	(f) $\bar{V}C_0$#C_0V

Sequences (a-c) are restricted in the meter. (d-f) are unrestricted.

Interval analysis: restricted sequences are intervals that change their weight.

Key to analysis: intervals includes entire C interlude, up to next V,

So, VC | V

Cross-linguistic weight patterns in V̆C#V

- V̆C#V is consistently parsed as Light π
    - in all periods and styles of A. Greek/Latin meter,
    - in Sanskrit (Arnold 1905)
    - Berber (Dell and Elmedlaoui 2008)
    - in Hungarian, Lithuanian quantitative hexameters.
    - no documented exception to this
- Intervals predict this: the only parse of V̆C(#)V is V̆C|V, |VC| = Light
- Syllables don't: if FAITH>>ONSET/*CODA, VC#V parsed as VC.V
  But a C_0VC unit is a Heavy, in a syllabic analysis.

Thank you

Appendix 1

V̌C#CV, V̌#CCV in Vergil, Hπ

Varieties of WEIGHTCORR

1. Generalized to all foot positions: foot-medial *and* foot-final
2. Generalized to all phrasal positions: phrase-medial *and* phrase-final
3. Generalized to all types of inputs: isolation forms *or* underlying forms
4. Limited to extreme mismatches of weight (L̆ ↔ H only)

All WEIGHTCORR types have in common the preservation of an interval's weight category from some input type to an output form in a metrical text.

Vergil presents evidence for all 4 varieties.

Generalizations on Vergil + post Vergilian poetry: weight-by-position Hs can't get their weight from across

		Word 1	Word 2	in Latin
longum [– …]$_\phi$ (foot medial)	1.	…V̆#	CCV…	impossible in Vergil (Hoenigswald 1949)
	2.	…V̆C#	C(C)V…	possible but restricted in Vergil
biceps […. –]$_\phi$ (foot final)	3.	…V̆#	CCV…	impossible in Vergil (Hoenigswald 1949)
	4.	…V̆C#	C(C)V…	highly restricted in Vergil

All 4 observations also correspond to Hilberg's (1879) laws on restricted weight-by-position Hs in A.Greek meter, dactylic or not.

Factors in these laws: an interval analysis

		Word 1	Word 2	in Latin
longum [– …]$_\phi$ (foot medial)	1.	…V̆#	CCV…	impossible in Vergil (Hoenigswald 1949)
	2.	…V̆C#	C(C)V…	possible but restricted in Vergil
biceps […–]$_\phi$ (foot final)	3.	…V̆#	CCV…	impossible in Vergil (Hoenigswald 1949)
	4.	…V̆C#	C(C)V…	highly restricted in Vergil

i. weight increase in an interval, relative to isolation form, is penalized (cf. 1-4)

ii. especially *at the end* of metrical constituents (cf. 2 vs. 4); cf. WEIGHTCORR

iii. *extreme* weight increase (L̆ →H) more strongly penalized than others (L →H):
(cf. (1,3),V̆#CC, absolutely banned in more contexts than V̆C#C(C))

Word classes exempt (Hilberg's 1879 'free words')

	Class	Why is this class exempt?
1.	proper names, esp. place names	no substitute for the word
2.	all articles, some pronominal adverbials, all prepositions conjunctions, complementizers*	no isolation form, no surface reference term to compare the increased weight to

*Common examples like *et terrīs,* begin with class 2 'free words'.

The interval interpretation of V̆C#CV, V̆#CCV restrictions

1. WeightCorr

   If an interval is foot-final, its isolation weight category is identical to its line-medial weight category.

   A * mark for each such weight mismatch, *L̆↔L, *L↔H, *L̆↔H.

2. X-WeightCorr

   No interval differs in weight from its isolation form by more than one step on the weight scale L̆-L-H.

   A * mark for each extreme weight mismatch, *L̆↔H.

Evidence in the Aeneid 1 on V̆C(#)CV

- Song 1 scanned into feet & intervals, to check avoidance of V̆C#CV
- All lines annotated for 6 varieties of heavies-by-position (**V̆CC**)

	Foot-medial (spondee or dactyl)		**Foot-final** (spondee-final)	
Word-final V̆C#CV	**Free word**	**Un-free word**	**Free word**	**Un-free word**
	234	503	161	36
Word-medial V̆CCV	1673		723	

Free word = lacks an isolation form, so it's freer to break WeightCorr,
under the OO-WeightCorr interpretation: the word lacks an isolation form

Interpretation

- H-by-position less common across # (**V̆C#C|V**) than word medial **V̆CC|V**
  - V̆C#C|V = 30% of all foot medial V̆CC Hs (N=2410)
  - V̆C#C|V = 21% of all foot final V̆CC Hs (N=910)

  Why? No form of WEIGHT CORR is violated by word medial H's **V̆CC.**

  While generalized WEIGHT CORR is violated by final V̆C#CV

- V̆C#CV is less common in foot-final than in foot-medial position

  ➡foot-final V̆C#C = 21% of all instances of V̆ C#CV (N=938)

  Why? WEIGHT CORR]$_{FT}$ is violated, in addition to general WEIGHT CORR
- cf. Soubiran's Law

Interpretation

- **V̆C#C|V** H's are far less common with 'unfree words' than with free words foot-finally (the most restricted metrical position) than foot-medially.

	Foot-medial (spondee or dactyl)		**Foot-final** (spondee-final)	
Word-final V̆C#_CV	**Free word**	**Un-free word**	**Free word**	**Un-free word**
	234	503	161	36

(Chi^2 p-value < .00001)

Why? (i) There are far more unfree words than free; the foot-medial ratio reflects the natural difference in text frequency between free/unfree words.

(ii)The foot-final 161/36 ratio reflects the joint effect of WEIGHT CORR]$_{ft}$ + fact that free words can't violate Weight Corr relative to isolation form.

Appendix 2:
Cluster compression effects

Cluster compression and *V̆#CC: Latin

- Latin bans V̆#CCV in all positions, iff CC = s-stop (Hoenigswald 1949)
- It allows V̆#CCV in Lights (biceps of dactyls), iff CC = stop-liquid
- Word-internal V̆CCV is always parsed Hπ if CC = s-stop and other CCs
- Word-internal V̆CCV is variably parsed Hπ ~ Lπ if CC = stop liquid
- No variation for initial V̆#CCV, if CC = stop-liquid, and no avoidance.
- Suggestions for analysis (cf. Italian cluster duration data in McCrary 2005):

  (i) stop-liquid clusters can be long (CC) or compressed, dur. equivalent to one C.

  (ii) s-stop clusters are incompressible.

  (iii) To avoid *Weight Change (*L̆ → H) violations, compressible clusters are compressed in V̆#CCV. Incompressible clusters are beyond repair. The only way to satisfy *L̆ → H is to avoid V̆#sTV.

Cluster compression and *V̆#CC: Greek (Steriade 2009)

- Homer parses most V̆#CCV sequences as Hπ
- Whether CC = stop-sonorant, or s-stop, or others.
- He parses word-internal V̆CCV nearly always as Hπ, for all clusters
- Post-Homer: a gradual increase in the frequency of V̆#CCV parsed Lπ, just for voiceless stop-sonorant CCs.
- Corresponding medial V̆CCV clusters lag behind in using the Lπ parse.
- Suggestions for analysis:

(i) All clusters are generally uncompressed in Homer,

(ii) Post-Homer, a marginal option of CC-compression, for some CCs, enters Greek. It is used to provide Lπ parses for V̆#CCV, to avoid violations of *Weight Change (*L̆ → H).

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