

3

4

TOC

- 1. The puzzle
- 2. Introduction to intervals
- 3. Weight alternations
- 4. Testing predictions
- 5. Sample of evidence, part 1: Dactyls and $\check{V}\#CV$ vs. $\check{V}C\#V$ in Vergil
- 6. Summary

Appendices and refs in the handout

The puzzle

Certain $V\!\left(C\right)$ word finals are avoided some contexts in the quantitative meters of Greek and Latin

Avoided word finals: under-attested or banned overall





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. [<u>mtə.tvə</u>], in the corresponding isolated fragments [m],[tə.1],[vəl].
- (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: VCC₀ 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

8













	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

V#V#VV#CVV#CCVWeight of π_1 LightLightHeavyE.g. armaarma etarma virumarma stantVC#VC#VVC#CVVC#CV		Isolation	before #V	before #CV	before #CCV
Weight of π_1 Light Light Heavy E.g. arma arma et arma virum arma stant VC# VC#V VC#CV VC#CV		V#	V#V	V#CV	V#CCV
E.g. arma arma et arma virum arma stant VC# VC#V VC#CV VC#CV	Weight of π_1		Light	Light	Heavy
VC# VC#V VC#CV VC#CCV	E.g.	arma	arma et	arma virum	arma stant
		VC#	VC#V	VC#CV	VC#CCV
Weight of π_1 Light Heavy Heavy	Weight of π_1		Light	Heavy	Heavy
E.g. ater ater et ater canis ater stat	E.g.	ater	ater et	ater canis	ater stat

synaples	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
syllabification, w	eight change:	ar. ma . stant →	ar. mas .tant; basi	c Light becomes a H

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
			,	

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 <mark>a</mark>	arm <mark>a</mark> et	arm av ir um	arm <mark>ast</mark> ant

arm a + st ant \rightarrow arm ast ant: Isolation ExtraLight (V) \rightarrow 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.	ater	at er et	at erc an is	at erst at

 $at | er + c | an | is \rightarrow at | erc | an | is$: isolation Light (VC) becomes Heavy VCC $at | er + st | at \rightarrow at | erst | at$: isolation Light (VC) becomes Heavy VCCC

	1 0 1/37	1.0.11037	
Isolation	before #V	before #CV	before #CCV
V#	V#V	V#CV	V#CCV
ExtraLight	ExtraLight	Light	Heavy
arma	arm <mark>a</mark> et	arm av ir um	arm ast ant
F	solation /# ExtraLight urm <mark>a</mark>	solation before #V /# V#V ExtraLight ExtraLight urm[a arm[a]et	solationbefore #Vbefore #CV/#V#VV#CVZxtraLightExtraLightLighturm aarm a etarm av ir um

 $\operatorname{arm} a + v | ir | um \rightarrow arm | av | ir | um: isolation ExtraLight (V) becomes Light (VC)$

22

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

Predictions summarized: different weight changes with syllables vs. intervals
grillables intermedia

	syl	lables	6			i	nterva	ıls		
	in	context	_#V	_#CV	_#CCV	ir	n context	_#V	_#CV	_#CCV
	L	V#	V.#V	V.#CV	$L \rightarrow H$ V#C.CV	Ľ	V#	V #V	$\stackrel{\check{L} \rightarrow L}{V \# C V}$	Ľ→H V#CC <mark></mark> V
tion	н	VC#	$H \rightarrow L$ V.C#V	VC.#CV	VC.#CCV		VC#	VC #V	L→H VC#CV	$\tilde{L} \rightarrow H$ VC#CC V
i isola	н	VCC#	VC.C#V	VCC.#CV	VCC.#CCV	H B	VCC#	VCC #V	VCC#C V	VCC#CC V
.=	Н	√# _	√.#V	V.#CV	∇#C.CV	∎∣н	V #	Ū #V	Ū#C V	H: V#CC V
	н	VC#	V.C#V	VC.#CV	VC.#CCV	Н	ŪC#	ŪC∣#V	∇̃C#C V	H: VC#CC V
-			-	-						24







(a) Ň#CV	(b)Ŭ#CC V	(c)ČC#C V	(d) $\mathbf{\check{V}C}$ #V	$(e)\breve{V}CC\#C_0 V$	(f) $\overline{\mathbf{V}}\mathbf{C}_0 \# \mathbf{C}_0$	
Lπ	Ηπ	Нπ	Lπ	Ηπ		
Ľ	Ľ	L	L	I	H	
Restricted	l finals ($\check{V}(C)$	#): their weig	ght <i>can</i> incre	ase, Ľ to L, Ľ/L	to H	

Interval-k	based hyp	otheses al	pout these	Ŭ(C)#restri	ictions	
(a) $\breve{V} \# C V$	(b) Ŭ #CC V	(c)ŬC#C V	$(d)\breve{V}C \#V$	$(e)\breve{V}CC\#C_0 V$	$(f) \mathbf{\bar{V}} C_0 \# C_0 \mathbf{V}$	
Lπ	Ηπ	Нπ	Lπ	Ηπ		
Ľ	Ľ	L	L	H	ł	
D 1		10 .1	1	Ť. T.Ť/T		

• Restricted finals (V(C)#): their weight *can* increase, L to L, L/L to H

 \circ Unrestricted finals ($\check{V}CCC_0\#,\,\bar{V}C_0\#)$ are already H, their weight can't increase

 $^\circ$ 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) Ŭ #C V	(b)Ŭ#CC V	\tilde{V}		(e)ŬCC#C ₀ V	(f) $\overline{\mathbf{V}}\mathbf{C}_0 \# \mathbf{C}_0 \ \mathbf{V}$
Lπ	Нπ	Ηπ Ηπ Lπ Ηπ		π	
Ľ	Ľ L		L	H	I
					30

29

a) Ŭ. #CV	(b)Ŭ#C.CV	(c)ŬC.#CV	$(d) \breve{V}_{\bullet} C \# V$	$(e)\breve{V}CC\#C_0V$	(f) $\overline{V}C_0 \# C_0 V$	
Lπ	Нπ	Нπ	Lπ	Н	Ιπ	
L	L	Н	Н	Н		



Changes of weight predicted by each theory												
syllables						in	terval	s				
	i	n context	_#V	_#CV	_#CCV				in context	_#V	_#CV	_#CCV
	L	V#	V.#V	V.#CV	$L \to H: V \# C.CV$			Ľ	V#	V #V	$\check{L} \to L {:} V \# C V$	$\tilde{L} \to H : V \# CC V$
-	н	VC#	$H \rightarrow L: V.C#V$	VC.#CV	VC.#CCV		~	L	VC#	VC #V	$L \to H: VC\#C V$	$\tilde{L} \rightarrow H: VC\#CC V$
isolation	Н	VCC#	VC.C#V	VCC.#CV	VCC.#CCV		isolation	Н	VCC#	VCC #V	VCC#C V	VCC#CC V
.п	Н	Ŵ#	Ū.#V	Ū.#CV	ν̄#C.CV		.п	Н	₩	$\nabla \#V$	\varphi #C V	H: ∇#CC V
	Н	ŪC#	∇.C#V	VC.#CV	VC.#CCV			н	∇C#	$\bar{V}C \#V$	$\bar{V}C\#C V$	H: VC#CC V
dī.ri.g i.t #e t H L L Basic H→L										dī I Ba	r ig e #s H L L asic Ľ→L	 e d





Vergilian examples
Common between dactyl and next foot: ṼC#V
Constitit, et lacrimans, "Quis jam locus" _inquit "Achātes" (Aen.1.459) [H LL]4 [H L L]4 [H L L]5 [H π]6
Less common, in same context: Ṽ#CV
Perge mod^e et, quā tē dūcit via, dīrige gressum. (Aen.1, 401) [H L L]4 [HL L]5 [H π]6
1. Transl. He paused and, tearing up, said: "Achates, uchat place now"
2. Transl. Only press on and direct your step where the route leads you.

	Foot 4			
			Major phrasal break	Word boundary
a.	ŬC#	V	113	119
b.	Ŭ#	CV	31	141
Rate in ft	e of ŬC#V at 4, where Sou	46%		

	Foot 4	Foot 5	Punctuation break	Word boundary
2	ŇС#	 V	15	no punctuation
a. b.	VC#	V CV	1	34
Rates betwe	s of VC#V at een ft 4 and f	end of all dae t 5:	etyls 94%	60%
Punc	tuation brea	k: when a pu	nctuation mark {, ; :	".} intervenes

circum cleaustra fremeunt: celsea sedete Aeoluse arce	C#V	
impulit• in latus• ac vent•i, velut• agmine_f•acto,	C#V	
Intonuere polei, et crebreis micate ignibuse aether,	C#V	
saevus ub•i-Aeacid•ae tel•o jacet H•ector_ub•i-ingens	C#V	Last word in foot 4 highlighted
terram inteer flucteus apereit; furite aestus hareenis,	C#V	• = foot boundary at interval bour
torquet ageens circeum, et rapideus vorate aequore_veo	C#V	
Disject•am Aene•ae, tot•o videt• aequore_cl•assem,	C#V	<h>> marks a voiceless V not a</h>
detrud•unt nav•is scopul•o; levat• ipse_trid•enti;	C#V	\leq in that is a volce is v , not a \leq is set Hector \geq is a volce is v .
iamque fac•es et s•axa vol•ant-furor• arma_min•istrat;	C#V	-j ak et ekt e
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 feinis ereat, cum Ieuppitere aethere_seummo	C#V	39

	foot	4 end foot 4	punctuation
quale man•us add•unt ebor•i decus,• aut_ubi_fl•avo	D	C#V	comma
Est in seecesseu longeo locus: insula_peortum	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,• omnium_eg•enos,	D	C#V	comma
haeret et• interd•um gremi•o fovet,• inscia_D•ido,	D	C#V	comma
Adsit leaetitieae Baccheus datore, et_bona_Jeuno;	D	C#V	comma
Quos inteer medieus veneit furore. Ille_Sycheaeum	D	C#V	period
Constitite, et lacrimeans, "Quis jeam locus"e inquit_Acheate,	D	C#V	quote
hinc atque-hoinc glomeroantur oroeades; oilla_pharoetram	D	C#V	semicolon
insideat quanteus misereae deuse; at_memore_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 mar							
	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 l	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)			

 $\check{V}C\#V$ preferred to $\check{V}\#CV$ at all post-dactyl punctuation breaks. Also: there is no context where $\check{V}\#CV$ is preferred to $\check{V}C\#V$.



41









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 4 th foot dactyl	(Soubiran	's Vergil IV-	VI data)	78%
After any dactyl + punctuation	(my)	nts)	82%	

Over-represented #V-initials after dactyls can't be attributed to the frequency of Vinitial 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.



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.

52

49

6. Summary



Compare interval and syllable accounts of metrical restrictions on VCC ₀ V across boundaries							
(a) \check{V} #CV	(b) Ŭ #CCV	(c)ŬC#CV	(d) ŬC#V	(e) V CC#C ₀ V	(f) $\overline{\mathbf{V}}\mathbf{C}_0 \# \mathbf{C}_0 \mathbf{V}$		
(a) $V\#CV$ (b) $V\#CCV$ (c) $VC\#CV$ (d) $VC\#V$ (e) $VCC\#C_0V$ (f) $VC_0\#C_0V$ Sequences (a-c) are restricted in the meter. (d-f) are unrestricted. <u>Interval analysis</u> : restricted sequences are intervals that change their weight. <u>Key to analysis</u> : intervals includes entire C interlude, up to next V, So, $VC \mid V$							
					52		





Appendix 1 ŘC#CV, Ř#CCV in Vergil, Hπ

55



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

		Word 1	Word 2	in Latin
longum $[-\ldots]_{\phi}$	1.	Ŭ#	CCV	impossible in Vergil (Hoenigswald 1949)
(foot medial)	2.	ŬC#	$C(C)V\ldots$	possible but restricted in Vergil
biceps [] ₀	3.	Ŭ#	CCV	impossible in Vergil (Hoenigswald 1949)
(foot final)	4.	ŬC#	$C(C)V\ldots$	highly restricted in Vergil

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

		Word 1	Word 2	in Latin		
longum [– …] _ø	1.	Ŭ#	CCV	impossible in Vergil (Hoenigswald 1949)		
(foot medial)	2.	ŬC#	$\mathbf{C}(\mathbf{C})\mathbf{V}\dots$	possible but restricted in Vergil		
biceps […−] _∲	3.	Ŭ#	CCV	impossible in Vergil (Hoenigswald 1949)		
(foot final)	4.	ŬC#	$\mathbf{C}(\mathbf{C})\mathbf{V}\dots$	highly restricted in Vergil		
i. weight increase in an interval, relative to isolation form, is penalized (cf. 1-4						
ii. especially at	the er	<i>id</i> of metr	ical consti	tuents (cf. 2 vs. 4); cf. WEIGHTCORR		
iii. <i>extreme</i> weight increase $(\check{L} \rightarrow H)$ more strongly penalized than others $(L \rightarrow H)$: (cf. (1,3), \check{V} #CC, absolutely banned in more contexts than $\check{V}C$ #C(C))						
(cf. (1,3), V #0	uu,	absolutely	, banneu i			

	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 th increased weight to
*C	ommon examples like <i>et terrīs</i> , begin	with class 2 'free words'.



Evidence in the Aeneid 1 on VC(#)CV

 \circ Song 1 scanned into feet & intervals, to check avoidance of $\,\check{V}C\#\mathrm{CV}$

• All lines annotated for 6 varieties of heavies-by-position ($\check{\mathbf{VCC}}$)

	Foot-medial (spondee or dactyl)	Foot-final (spondee-final)		
Word-final	Free word	Un-free word	Free word	Un-free word	
VC#CV	234	503	161	36	
Word-medial VCCV	dial 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

62

61

Interpretation

• cf. Soubiran's Law

61

Interpretation

• **VC#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	Free word	Un-free word	Free word	Un-free word	
VC#_CV	234	503	161	36	

 $(Chi^2 \text{ p-value} < .00001)$

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] $_{\rm ft}$ + fact that free words can't violate Weight Corr relative to isolation form.



• H-by-position less common across # (**VC#C | V**) than word medial **VCC | V**

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

Why? WEIGHT CORR]FT is violated, in addition to general WEIGHT CORR

VC#C | V = 30% of all foot medial VCC Hs (N=2410)
VC#C | V = 21% of all foot final VCC Hs (N=910)

While generalized WEIGHT CORR is violated by final VC#CV

VC#CV is less common in foot-final than in foot-medial position
 ⇒ foot-final VC#C = 21% of all instances of V C#CV (N=938)

Cluster compression and *V#CC: Latin

• Latin bans \check{V} #CCV in all positions, iff CC = s-stop (Hoenigswald 1949)

• It allows \check{V} #CCV in Lights (biceps of dactyls), iff CC = stop-liquid

• Word-internal $\check{V}CCV$ is always parsed $H\pi$ if CC = s-stop and other CCs

- Word-internal $\check{V}\mathrm{CCV}$ is variably parsed $\mathrm{H}\pi\sim\mathrm{L}\pi$ if CC = stop liquid

• No variation for initial \check{V} #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 (* $\check{L} \rightarrow H$) violations, compressible clusters are compressed in \check{V} #CCV. Incompressible clusters are beyond repair. The only way to satisfy * $\check{L} \rightarrow H$ is to avoid \check{V} #sTV.

65

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

- Homer parses most \check{V} #CCV sequences as $H\pi$
- Whether CC = stop-sonorant, or s-stop, or others.
- He parses word-internal $\check{V}CCV$ nearly always as $H\pi$, for all clusters
- Post-Homer: a gradual increase in the frequency of V
 #CCV parsed Lπ, just for voiceless stop-sonorant CCs.
- Corresponding medial $\check{V}CCV$ clusters lag behind in using the L π 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 $L\pi$ parses for $\check{V}\#CCV$, to avoid violations of *Weight Change (* $\check{L} \rightarrow H$).

66

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