The distribution of vowels in English and trochaic proper government

The vowel system of English (RP) is given in (1), with examples and references, on page 3. The distribution of different types of stressed vowels in syllable structure is shown in (2), within monomorphemic forms. (Pre-R vowels are not included, as they always must be followed by an (underlying) /r/.) The distribution of short lax and tense vowels is almost complementary. Short lax vowels do not occur before a vowel (i.d) and word-finally (i.e), that is, they cannot stand at the end of a syllable, except as in (i.a-b). Tense vowels, in contrast, cannot occur in a closed syllable (iii.c, iii.g), except in (iii.f). Long lax vowels form a category in-between: they are ruled out in closed syllables (ii.c, ii.g), just like tense vowels; but they are also prohibited prevocalically (ii.d), resembling short lax vowels in this. (Note that the restrictions in (c) and (g) do not apply to coronal clusters, and clusters involving /s/.)

(2) *stressed vowels*		(i) short lax	(ii) long lax	(iii) tense
internal	(a) _ $CV	ˈsɪ̲ti ‘city’	ˈɔ̲ːtəm ‘autumn’	ˈmi̲ːtə ‘meter’
	(b) _ $CCV	ˈmæ̲krəʊ ‘macro’	ˈɔ̲ːdri ‘Audrey’	ˈma̲ɪkrəʊ ‘micro’
	(c) _ C$CV	ˈvɛ̲ktə ‘vector’	*	*
	(d) _ $V	*	*	ˈpə̲ʊɪt ‘poet’
final	(e) _ #	*	bra̲ː ‘bra’	bra̲ʊ ‘brow’
	(f) _ C#	hʊ̲k ‘hook’	hɔ̲ːk ‘hawk’	hɔ̲ɪk ‘hoick’
	(g) _ CC#	gʌ̲lp ‘gulp’	*	*

The pattern in (2i) can be accounted for by requiring stressed syllables to be heavy in English, and assuming virtual geminates in (2i.a-b) to close the first syllable (as proposed by Hammond 1997). (2i.d-e) are then excluded, because a short lax vowel in an open syllable is light. To account for the lack of long vowels in closed syllables (2ii-iii.c,g) (not discussed by Hammond), however, we must also pose an upper limit on stressed rhymes, in effect restricting them to contain *exactly two* positions. Since “superheavy” rhymes (2ii-iii.f) and (2i.g) are only allowed word-finally, their final consonant can be assumed to be extrasyllabic (viz. (VV$C) and (VC$C)), thereby making such rhymes bipositional as well.

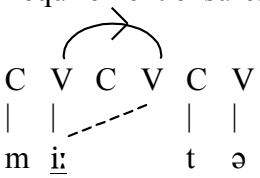
The absence of long lax vowels in prevocalic position (2ii.d) must then be the result of a separate constraint. This is confirmed, if we examine the distribution of reduced vowels in English, as given in (3).

(3) *reduced vowels*		(i) [ə]	(ii) [ɪ/i/j]	(iii) [ʊ/u/uː/w]
internal	(a) _ $CV	ə̲ˈfɛkt ‘affect’	ɪ̲ˈfɛkt ‘effect’	ju̲ˈnaɪt ‘unite’ ˈrɛgjʊ̲lə ‘regular’
	(b) _ $CCV	ə̲ˈkleɪm ‘acclaim’	ɪ̲ˈklɪps ‘eclipse’	?
	(c) _ C$CV	ˈkɒntə̲mpleɪt ‘contemplate’	ˈænɪ̲kdəʊt ‘anecdote’	*
	(d) _ $V	*	kri̲ˈeɪt ‘create’ ˈhɪd{i̲/j̲}əs ‘hideous’	ˌsɪtʃu̲ˈeɪʃn ‘situation’ ˈvɪʒ{u̲/w̲}əl ‘visual’
final	(e) _ #	ˈsəʊfə̲ ‘sofa’	ˈsəʊfi̲ ‘Sophie’	ˈmenjuː ‘menu’
	(f) _ C#	ˈæbə̲t ‘abbot’	ˈræbɪ̲t ‘rabbit’	*
	(g) _ CC#	*	*	*

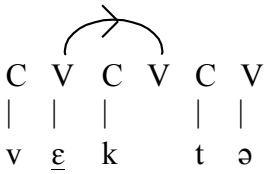
Columns (ii) and (iii) show that [ɪ] and [ʊ] have different realisations depending on the context. Simplifying somewhat, it can be stated that they are tensed word-finally (ii-iii.e), and tensed or glided in prevocalic position (ii-iii.d). [ə], which has no tense counterpart, cannot occur before another vowel (i.d). There seems to be thus a general ban on prevocalic lax vowels. Hammond 1997 analyses the tensing of reduced vowels in terms of lengthening (mora addition) as well. Then, however, it becomes difficult to analyse the alternation between a tense (for Hammond, long) vowel and a glide, exhibited by forms like *hideous* (ii.d) and *visual* (iii.d). Moreover, the lack of prevocalic stressed long lax vowels (2ii.d) needs to be analysed as the result of a separate constraint, thereby missing a generalisation.

In this talk, I will propose a CV analysis of these facts (in terms of Lowenstamm 1996), where "syllable structure" consists of a strict alternation of C and V positions, as a result of which the representation of long vowels, geminates and consonant clusters contains an empty nucleus. I will utilise trochaic (left-to-right) proper government (PG) (following Rowicka 1999). I will analyse the restriction of bipositional stressed rhymes by requiring the stressed position in English to properly govern an empty position to its right. Since lax vowels are represented as headless and tense vowels as headed in Government Phonology (GP) (Harris 1994), this requirement ensures that all stressed vowels are heads in some sense.

(4) (a)

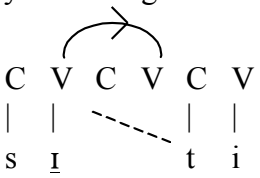


(b)

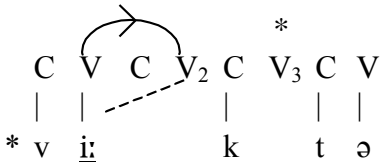


The requirement of PG is clearly satisfied by long vowels in "open rhymes" (4a=2ii-iii.a) and short vowels in "closed rhymes" (4b=2i.c). Short vowels in seemingly open rhymes must be followed by a virtual geminate (5a=2i.a) to satisfy the requirement.

(5) (a)



(b)



Word-finally or prevocalically (2i.d-e), however, there is no following consonant that could spread to the empty CV-unit, therefore such forms are ruled out. Finally, long vowels cannot occur in "closed rhymes" (5b=2ii-iii.c), because then the empty V_3 would remain unlicensed, as the governed V_2 is unable to govern it. (The empty nucleus inside "branching onsets" (2b) does not need to be PGed, because it is trapped inside a closed domain (Scheer 1999).)

In fact, the restriction concerning short vs. long vowels shown in (4b) vs. (5b) does not only apply in the case of coda-onset clusters, but also before so-called 'bogus clusters' (e.g ['æ̲tləs] 'atlas', but *['e̲tləs]), where the consonants cannot form either a coda-onset cluster, or a branching onset in any version of GP, therefore they must be separated by an empty nucleus (e.g. KLV 1990). An advantage of the CV analysis is that only this approach can unify the representations of these two types of contexts.

Unstressed vowels, on the other hand, are reduced, by either losing all of their elements, resulting in a schwa, or keeping the single element **I** or **U**. These are typically headless (being unstressed), but they can be required to become headed, i.e. tense, in certain positions.

I will show that this analysis accounts for the distributional facts of both stressed and unstressed vowels by a very minimalist formalism, utilising only CV-units and proper government. Furthermore, it is supported by the existence of accents like Welsh English, where "single consonants in medial position following a short stressed vowel are phonetically long" (Thomas 1984:185) (cf. (2i.a) and (5a)), making virtual geminates audible.

(1) *vowel system of RP* (e.g. Burzio 2007, Chomsky & Halle 1968, Gimson 1980, Jones 1966, Kreidler 1989, Nádasdy 2006, Wells 1982, 1990)

	short						long								
	ɪ	ɛ	æ	ɒ	ʌ	ʊ	ɔː[1]	ɑː[1]	(ɜː[1])	iː	uː	eɪ	əʊ	aɪ	aʊ	ɔɪ
pre-R							ɔː[2]	ɑː[2]	ɜː[2]	ɪə	ʊə	ɛə	ɔː[3]	aɪə	aʊə	ɔɪə
	lax						tense									

(a) *short lax*		(b) *long lax*		(c) *long lax pre-R*		(d) *tense*		(e) *tense pre-R*	
/ɪ/	pit	/ɔː[1]/	paw	/ɔː[2]/	port	/iː/	bee	/ɪə/	beer
/ɛ/	pet	/ɑː[1]/	spa	/ɑː[2]/	part	/uː/	boo	/ʊə/	boor
/æ/	pat	(/ɜː[1]/	colonel)	/ɜː[2]/	pert	/eɪ/	bay	/ɛə/	bear
/ɒ/	pot					/əʊ/	bow	/ɔː[3]/	bore
/ʌ/	putt					/aɪ/	buy	/aɪə/	tire
/ʊ/	put					/aʊ/	bough	/aʊə/	tower
						/ɔɪ/	boy	/ɔɪə/	Moir

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