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System geometry and segment structure: a question of Scots economy

John Anderson

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1 Introduction

Out of the many exciting questions concerning segment structure that are currently being explored I shall address only one here, and that only in the context of a wider concern with issues arising from what one might call **system geometry** - roughly, the shape of the space defined by the oppositions between segments.* And I shall adopt a rather minimalist view of segment structure. Let me begin by outlining what assumptions I shall make: omissions should then be clearer. I shall then consider a proposed correlation between system geometry and segment structure and its consequences for theories of **non-specification**, specifically in relation to a particular variety of English.

I assume the basic properties of segment structure attributed to it by the notation of dependency phonology: the atomic elements, called components in the DP tradition, are **unary** or **simplex**, in the sense that segments are differentiated not by a change of feature value but in part simply by presence vs. absence of a component; components are grouped into systematic sub-segmental bundles called **gestures**; if two or more components are present in the characterisation of a particular segment,

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or rather, gesture, the components may combine simply or asymmetrically - one may **govern** the other, have it as a **dependent**. This same non-symmetrical relation is manifested in the head-modifier relationships of suprasegmental structure, both lexical and non-lexical: hence its eponymous relationship with the framework.¹

Components are grouped into gestures, apart from anything else, on the basis of just such interaction: components within the same gesture are potentially related by dependency. Say we recognise two basic gestures: a **categorial** gesture which is comprised of those "sonority-related" components that determine the basic "syntax" of segments, their "major class"; and an **articulatory** gesture, containing essentially "locational" components, describing the vowel space and place of articulation for consonants. We can allow for most of the "major classes" and their hierarchisation in terms of the interaction of two components, **V** (vocalic) and **C** (consonantal). We can think of their substance in rather Jakobsonian terms: vocalic is associated with a relatively well-marked formant structure; consonantal with energy reduction associated with an obstruction in their production which does not constitute a periodic sound source. Segments characterised by presence of **V** alone are vowels; **C** alone characterises lax voiceless plosives. Other classes involve combinations of **C** and **V** and varying dependencies between them, as illustrated in (1):

1)	<i>vowels</i>	<i>sonor.Cs</i>	<i>fricatives</i>	<i>vd. plos.</i>	<i>vs. plos.</i>
	V	V;C	V:C	C;V	C

The semi-colon indicates dependency, with the governor to the left; the colon in the representation for fricatives denotes mutual dependency: **V** governs **C** and **C** governs **V**. With voiced plosives the **V** component, associated in this case with voicing, is dependent, secondary; with sonorants, for various reasons (in terms of implementation), the harmonicity associated with **V** is predominant over the suppressive **C** component.

These representations allow for the expression of **natural classes**, as exemplified in (2):

2) the representations for:

- a. consonants contain **C**
- b. vowels contain only **V**
- c. sonorants contain an ungoverned **V**
- d. obstruents contain a governing **C**
- e. plosives contain an ungoverned **C**

(As concerns the formulation of (d), note that in the representation for voiceless plosives **C** governs the identity element.)

They also define a **hierarchy** in terms of the relative preponderance of **V** and **C**, with preponderance measured in terms of presence and government, and with

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preponderance of **V** decreasing to the right in (1). We can extend the hierarchy by introducing second-order dependencies, as in (3):

3)	<i>vowels</i>	<i>liquids</i>	<i>nasals</i>	<i>vd frics</i>	<i>vs frics</i>	<i>vd plos</i>	<i>vs plos</i>
	V	V;(V:C)	V;C	(V:C);V	V:C	C;V	C

Liquids and voiced fricatives involve a mutually dependent **V** and **C** in a dependency relation with a further **V**: voicing in obstruents, then, is uniformly characterised by a dependent **V**; sonority in consonants by a unilaterally governing **V**; continuancy by a mutually governing **V** and **C**; stophood by a **C** which is not mutually governed. Natural classes can still be appropriately characterised. And we now have something approaching a full "sonority" hierarchy, to which we can relate basic "syntax" (i. e. syllable-structure) as well as processes of lenition and fortition: lenition, for instance, involves an increase in the preponderance of **V**.

The representations also characterise degree of **markedness** directly, in terms of the relative complexity of the categorial structures: thus, for example, voiced fricatives emerge as more complex than both voiceless fricatives and voiced plosives; liquids are more complex than nasals; vowels are minimally complex.

The components of the articulatory gesture interact in a similar way. Given the components in (4) as determinants of the vowel space (as well as of analogous consonantal distinctions):

4)	i	acuteness/palatality
	u	graveness/peripheral constriction
	a	compactness/lowness
	ə	reduction/centrality

we can characterise the "classic" seven-vowel system of (5.a) as in (5.b):

5a.	/i/	/u/	b.	i	u	<i>close</i>	}	<i>high</i>
	/e/	/o/		i;a	u;a			
	/ɛ/	/ɔ/		a;i	a;u		}	<i>mid</i>
	/a/			a	<i>open</i>			
							}	<i>low</i>

Again, natural classes are appropriately captured:

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6) the representations for:

- | | | |
|----|---|------|
| a. | non-close vowels contain a | {a} |
| b. | low vowels contain a governing a | {a;} |
| c. | non-round vowels do not contain u | ~{u} |
| d. | close vowels do not contain a | ~{a} |
| e. | mid vowels contain a and another feature | {a,} |
| f. | non-open vowels contain a feature other than a | {~a} |

where the comma in (e) denotes combination and is neutral between government and dependency; and the braces enclose the representation for a gesture. - Thus, a fuller representation for /e/ in a system such as (5.a) would be as in (7):

7) {{V}{i;a}}

which includes both gestures. The representations are clearly system-dependent: a phonetically similar vowel in the "classic" five-vowel system of (8):

8)

/i/	/u/
/e/	/o/
	/a/

would be represented at a contrastive level as in (9):

9) {{V}{i,a}}

wherein **i** and **a** are simply combined, there being no opposition within the mid vowels.

In terms of markedness, the mid vowels in (5) are appropriately inherently more complex than the non-mid, for example. The close front rounded vowel /y/, represented in (10.a), is also complex:

10)a. {i,u} /y/ (/ü/)
 b. {i,u,a} /ø/ (/ö/)

and the mid front rounded vowel of (10. b) even more so. And the representations in (5.b) also define, for example, a dimension of height: relative height correlates with proportion of a relative to other features; so that as we move from close to open the preponderance of **a** increases. "Chain-shifts" involving raising, then, are characterised by suppression of **a** by one degree within the input system (cf. e.g. Anderson 1980).

It can be argued that the gestural hierarchy is more complex than this. But my concern here is with another aspect of segment organisation, one that follows from the unary feature assumption. Gestures are constituted by presence and absence of components, possibly (where more than one is present) in dependency relations. One possible representation for each gesture is thus the empty one: no components are present. A body of recent work has been devoted to demonstrating the descriptive advantages of assuming that particular segments may be **unspecified**

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coincidence of the unspecified vowel with the recurrently epenthetic vowel for the language concerned: epenthesis of the minimal vowel is simpler to formulate than epenthesis of any other. What I shall look at is an asymmetrical system whose isolated vowel displays various eccentric properties. The question is: why are these particular properties associated with the unspecified vowel?

2 The unspecified vowels of Scottish Standard English

The variety of English I am focussing on is Standard English as spoken in Scotland, i. e. Standard English with a Scottish accent. Phonologically, Scottish Standard English (SSE) differs from Scots dialects principally in the lexical distribution of its vowel phonemes (as e.g. in the familiar *house/hoose* difference). But the system of vowel contrasts, as well as many other phonological regularities, has much in common with those of the dialects. Thus, much of what I'm going to say carries over to them; but I do not pursue this here.²

We can associate with the accent the set of monophthongal vowel phonemes tabulated in (13), where I interpret "phonemes" as the contrastive elements that emerge from the lexical phonology:

13)a	i:	u:	b.	
			ɪ	
	e:	o:	ɛ	ʌ
		ɔ:		
			a	

with instances as in (14):

14) a.	beat	boot	b.	
	bait	boat	bit	
		bought	bet	but
			bat	

The notation of (13) has no systematic status, and it is redundant, in distinguishing certain vowel pairs by both quality and quantity. I shall take the quantity distinction as primary, in that it is relevant to various regularities in the lexical phonology, as we shall see. The vowels in (13.a) are those which can occur finally in a stressed syllable; they are also inherently longer than vowels in (b) at the same height - i. e. they are longer in identical contexts, though the quantitative distinction is less marked in Scottish varieties of English. (I should point out that this interpretation departs from a long tradition in studies of Scots and SSE, which does not recognise the relevance of "inherent length" as such.)

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The short vowel in *but* is eccentric, isolated: the other short vowels involve combinations of *i* and *a*; it is a centralised back vowel, appropriately distinguished by presence of the *ə* component, as is its unstressed congener. The short system can then be reinterpreted as in (15):

15)	{i}	{i,a}	{a}	{ }
	bit	bet	bat	but

with the vowel in *but* as the unspecified vowel.

The SSE long vowels in the righthand column of (13/14. a) have no short congeners; the open vowel /a/ in *bat* lacks a long equivalent. This is in part a result of the historical collapses illustrated in (16) by comparison with the system of Received Pronunciation (RP):

16)	<i>RP</i>		<i>SSE</i>
	pool	/u:/ } /ʊ/ }	pool, pull
	pull		
	caught	/ɔ:/ } /ɒ/ }	caught, cot
	cot		
	psalm	/ɑ:/ } /æ/ }	psalm, Sam
	Sam		

It is these collapses, in Scots and SSE, which have provided the major impulse to interpretations of their vowel systems from which vocalic length is omitted as a contrastive dimension.

Thus, length is neutralised at these various positions, but the realisation of the neutralisation in the case of the non-open vowels is long; and they can freely occur finally in a stressed syllable, for example:

17)	a.	do	crew	loo	shoe	clue	who
	b.	dough	grow	low	show	glow	go
	c.	paw	raw	law	saw	claw	haw

Examples of stressed final /a/, on the other hand, are few:

18) bra, lah, Shah

and mostly marginal items. I therefore take the open vowel to be redundantly short, with the vowel in exceptional items like those in (18), and in the penultimate syllable in (19), marked lexically as long:

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19) candelabra, palaver

to override the redundancy.³

There is, perhaps, some doubt as to whether neutralised and un-neutralised vowels should be included in the same system. Decisions in this area are not, however, crucial to our present concerns. Whether these neutralised vowels belong to just one of the systems, as shown in (13/14), or to both, or to neither, the vowel in *but* remains isolated, and the obvious candidate for non-specification. Similarly, the long low mid vowel in *bought* is isolated: it is not matched by a front congener; it is only because of its presence in the system of (13.a) that we need to invoke contrastive differences in dependency between the long back round vowels:

20) boat {u;a} bought {a;u}
 bait {i,a}

The SSE long vowel system, in these terms, constitutes an instance of the asymmetric geometry (12.b). And the /ɔ:/ vowel is thus selected as unspecified. Even if /a/ is also included in the long system, or the back round vowels are taken to constitute a separate sub-system, or they are grouped in such once more with /a/, as not involving a length contrast, /ɔ:/ remains the non-short vowel whose "removal" contributes most simply to systemic symmetry. We can thus reinterpret the long system of (13/14.a) as the symmetrical one in (21):

21) {i} {i,a} {a} {u,a} {u} { }
 beat bait candelabra boat boot bought

which also includes the non-contrastive long low vowel exemplified in the marked items of (18) and (19).

Now, attribution of non-specification to the vowel in *bought* also correlates with various phonological regularities, in this and other varieties of English, partly in instances where lack of specification is patently crucial, but also in cases where the reasons for the relevance of non-specification are much less obvious. I turn to these latter in §3. Let us here consider the role of non-specification in the characterisation of a phenomenon to which it is naturally relevant.

I am suggesting, then, that contrastively the articulatory gesture for both the /ʌ/ of *but* and the /ɔ:/ of *bought* is empty; they themselves differ in quantity. The value for the latter is filled in by the redundancy in (22):

22) { } ⇒ a;u
 ⋮
 ⋮
 {V,V}

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which specifies the empty long vowel (represented by a combination of two Vs) as low mid. Clearly, such a characterisation is the more interesting the later the redundancy applies. Application of (22) after the vowel shift (VS), for instance, leads to descriptive improvements.

Four of the vowels in (21) are possible outputs from VS, in this and other varieties of English:

23)	{i}	{i,a}	{a,u}	{u}
	serene	profane	cone	school

though motivating alternations in the case of the back vowels are admittedly not numerous. (However, there is no reason to exclude them in principle.) The vowel in *candelabra* etc., and in many more forms in other varieties, is not associated with VS: the long open monophthong is neither an input nor an output from VS. We can characterise the input set for VS as in (24):

24)	{ V,V }
	⋮
	{~a}

i. e. long vowels (an articulatory gesture consisting solely of V combined with V) associated with an articulatory gesture containing a component other than a, thus non-open. The articulatory specification does not preclude the presence of a in the gesture, whereas the verticals in the categorial representation exclude any further components or relationships. (I ignore here prosodic restrictions.)

VS increases the proportion of ~a by one degree. Applied to the input system of (25.a) it yields (b):

25)a.	{a;i}	⇒	b.	{i;a}	profane
	{i;a}	⇒		{i}	serene
	{i}	⇒		{a} {i}	sublime
	{a;u}	⇒		{u;a}	cone
	{u;a}	⇒		{u}	school

The third example illustrates the escape route via diphthongisation taken by vowels that cannot increase their proportion of ~a. The dependency relation with the derived high mid vowel in *profane* is not contrastive: there is no long low mid front vowel. The vowel in *cone* comes to contrast with the low mid produced by (22).

There are no alternations motivating the attribution of VS derivations to forms containing the /ɔ:/ vowel of *bought*, and indeed no alternations motivating a source distinct from that long low mid back vowel. This is allowed for if this is indeed in origin the empty vowel. As such it fails to undergo VS - it is not ~a - and its value is filled in by (22). Thus, both the penultimate vowel in *candelabra* etc. and the vowel in *bought* etc. escape application of VS by failing to contain a ~a component.

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The derivation of /ɔ:/ is maximally concrete, involving simply the redundancy (22). Attribution of non-specification to /ɔ:/, based on the system geometry, accords with its non-availability for VS; this is a natural descriptive advantage of the attribution.

However, /ɔ:/ also fails to participate in some other regularities involving long vowels where the basis for its exclusion does not emerge in an obvious way from what seem to be the appropriate formulations. These are quantitative phenomena to which the articulatory specification, or non-specification, does not appear as such to be relevant. Let us now turn to one of these, a phenomenon well-known to students of Scots and SSE.

3. Specification and the Scottish vowel length rule

Scottish English, like other varieties, displays the familiar superficial context-dependent variation in vowel length indicated in (26):

26) see seize seed scene cease seat

decreasing length —————→

i. e. with greatest length finally, and with greater length before voiced consonants than before voiceless; within these sets continuants promote vowel length more than non-continuants. As a context the lateral belongs with the nasals, as in rhotic American English, does /r/. (Cf. e.g. Peterson and Lehiste 1960; House 1961; Elsendoorn 1984.)

But there has also been attributed to SSE a further, apparently lexical (see below) distinction in vowel length which may be absent from varieties other than Scottish and related (cf. Agutter (in press a, b) for some doubts concerning the "Scottishness" of this phenomenon); in some instances, at least, there are also qualitative correlates of the distinction. This phenomenon has been formulated as the Scottish Vowel Length Rule (SVLJ), or "Aitken's Law" (after its initial formulator and most prolific advocate). The account I shall offer differs rather from earlier accounts (Aitken 1962, 1975, 1981; Lass 1974; Ewen 1977); I shall attempt to justify this as we proceed. Let us now look at the basic phenomenon.

The stressed inherently long vowels in the set in (13.a/21) show a marked discrepancy in length depending on which of the environments of (27) they occur in:

27) a. _____ r, v, z, ð, ʒ
 b. _____ l, nasals, voiceless fricatives, plosives

with the latter being markedly shorter (and possibly different in quality). Some examples are given in (28):

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28)	<i>LONG</i>	<i>SHORT</i>
	more	mole
	save	safe
	freeze	Fries
	rouge	ruche

Final position also counts as length-inducing or -preserving; and we also find the long variant in forms such as (29.b), with a following suffixal consonant:

29)	<i>LONG</i>	<i>SHORT</i>
a.	row	road
b.	rowed	

The distinction is perhaps most salient in the case of the diphthong /ai/, so far unconsidered, but clearly also inherently long (like the vowels in (13)). In its case the quantitative difference is accompanied by a very obvious qualitative one:

30)	<i>LONG</i>	<i>SHORT</i>
	pyre [pa:er]	pile [p ^h ɪl]
	rise [ra:ez]	rice [r ^h ɪs]
	live (adj.) [la:ev]	life [l ^h ɪf]
	sighed [sa:ed]	side [s ^h ɪd]
	sigh [sa:e]	sight [s ^h ɪt]

Indeed, Noske *et al* (1982) regard the qualitative difference as primary. Allan (1985) points out this is associated with a failure to consider the whole range of SVLR phenomena; but it may be that the quality variation is not entirely as predicted by SVLR (and for some speakers the two diphthongs are perhaps marginally contrastive - see e.g. Wells 1982: § 5.2.4, and cf. note 4 below). I ignore, however, this potential complication and treat this diphthong variation along with other SVLR alternations as basically quantitative.

Examples like (29.b) and *sighed* have in the past been taken to warrant invoking morphological information in the formulation of SVLR. Thus, Lass (1974) gives the context for the long variant as (31):

31)	—	$\left\{ \begin{array}{l} v \quad z \quad \delta \\ \quad r \\ \quad \# \end{array} \right\}$
-----	---	---

But this is unnecessary, and, indeed, inadequate. For we also need to invoke syllable boundary as a length conditioner. This accounts for the pre-hiatus examples in (32.a), as well as the distinction between (32.b) and (c):

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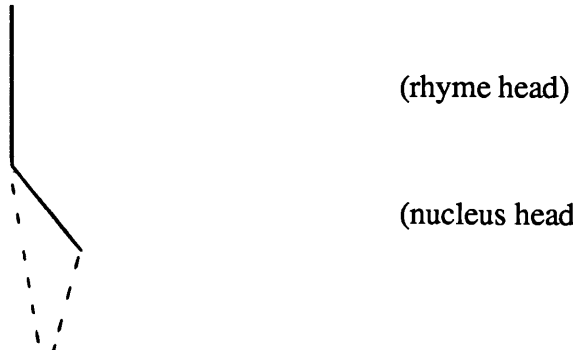
- 32) a. bias, hiatus [a:e]
 b. pylon, Midas [a:e]
 c. pile, side [ʌɪ]

After an inherently long vowel, at least, the intervocalic consonant in (32.a) belongs entirely with the following syllable. The syllable final first vowel shows the SVLR long variant: syllable-final is a long context. This also accounts for the length in an example like [sa:e] in (30). And it will also allow for the presence of the long variant in *sighed*, given an extrametrical status for the consonant of the suffix; characterised, say, by something like the structure abbreviated in (33):

- 33) [[s[ai]]D]

such that the final consonant is excluded from the rhyme, and indeed from the syllable itself (the second-outermost brackets in (33)).

We can thus formulate SVLR as a shortening or absence of length of the vowels of (13.a) before a consonant in the same syllable which is not a voiced fricative or /r/, as roughly formulated in (34), which bans the erection of a complex nucleus above a long vowel just in the circumstances indicated:⁴

- 34) * 
 {V,V} / → {C}, {C} ≠ {V,(V:C)}

i. e. where the rhyme also contains, as a dependent of the head (→ {C}), a consonant which fails to meet the specification that unites the voiced fricatives and /r/. They are represented as in (35.a); other consonants as in (b):

- 35)a. {V;(V:C)} (/r/), {(V:C),V} (voiced fricatives)
 b. {V;(V:C);C} (/l/), {V;C} (nasals), {V:C} (voiceless fricatives),
 {C;V} (voiced plosives), {C} (voiceless plosives)

Most of these representations were discussed in §1 above, as well as, in more detail, in Anderson and Ewen 1987: ch. 4. /l/ differs from /r/ in being more complex by virtue of an additional dependent C associated with its marginal stop character. Only /r/ and the voiced fricatives are specified just as required by the condition in (34).⁵

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Unlike Trisyllabic Shortening (TSS), say, SVLR does not destroy the inherent length specification; the vowels concerned remain {V, V}. SVLR applies before the addition of the suffixes in (36), and resultant re-syllabification:

36) piling, righteous, rider

and the vowels emerge as SVLR-short, as represented in (37.a):

37)a. [pʌɪlɪŋ], [rʌɪtʃʌs], [rʌɪdər]

b. [spɑːɛdər]

Compare the monomorphemic form in (b), which is typically long, as shown. But these vowels in (37.a) remain eligible for VS, given their retained {V,V} specification. We can refer to SVLR as a **prosodic shortening**: the vowels concerned retain inherent length. TSS, on the other hand, substitutes a single V for two, modifying inherent length, and thus availability for VS, as in the the case of the prepenultimate vowel of the familiar example in (38):

38) serenity {V} {i,a} (cf. *serene* {V.V} {i})

Let us refer to the shortening associated with TSS as **categorial**.

Now, however we choose to characterise SVLR, its interest from the point of view of our present concerns - which, as you may have by now forgotten, are with the role of unspecified vowels - is this: of all the vowels in (13.a) only /ɔ:/ fails to show uncontroversial variation in accord with SVLR. So that the vowel pairs in (39) do not show significant length differences:

39)a. Claude, clawed

b. gnawed, nod

and other length variations are in accord with the superficial scale of (26).⁶ This brings us to the question which I anticipated at the ends of §§1 and 2: why should the qualitatively unspecified vowel /ɔ:/ fail to participate in a quantitative adjustment such as SVLR?

And the question becomes yet more interesting by virtue of the fact that it is not merely the prosodic shortening of SVLR that /ɔ:/ fails to be susceptible to. It is also (unlike the other vowels of (13.a)) unaffected by TSS; so the prepenult in (40):

40) paucity {V,V} {a;u}

has the same vowel (barring surface variation) as those in (39).the unspecified long vowel is not susceptible to either the prosodic or the categorial shortening. Is this idiosyncratic, or does it follow from some general principle? Recurrence of such phenomena suggests the latter.

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Notes

* I am grateful to Fran Colman and Moira Yip for comments on the version of this paper presented at the NELS meeting, and to Alex Agutter for her careful reading of a pre-final version.

1. For more detailed discussion of dependency phonology see particularly Anderson and Jones 1974, 1977; Anderson and Ewen 1980, 1987; Anderson and Durand 1987; Durand 1986; on suprasegmental structure see especially Anderson 1986. A more extensive account of non-specification in English is provided by Anderson to appear.

2. On the vowel systems of dialects of Scots see particularly Catford 1958, Aitken 1981; accounts of SSE are offered in e.g. Abercrombie 1979, Wells 1982: § 5.2. My discussion is based on SSE as manifested in Edinburgh.

3. Some instances of /o/ will also have to be marked, conversely, as lexically short, with a long (tense) realisation emerging only in syllable-final position in unstressed word- or foot-final syllables: *audio*, *audiophile*. This lexically short /o/, as well as the derived shorts resulting from e. g. Trisyllabic Shortening (§3 below) - e. g. *ferocity* (cf. *ferocious*), is realised identically with the unspecified vowel (/ɔ:/ - see below): *audiometry*. Cf. too *atomic*, with short /o/, such that the vowel is reduced to [ə] in *atom* under lack of stress, which as a short vowel it rejects.

4. Accounts of SVLR also usually associate it with /a/ and /ɛ/ in (13.b), such that they are alleged to show lengthened variants in the contexts in (31), i. e. (35. a) below. However, as indicated, the occurrence of /a/ in syllable- (or word-) final position is marginal; and such occurrences cannot be uncontroversially attributed to /ɛ/: exemplification has to resort to *meh* "cry of sheep" (Aitken 1981: 133). This means that firm evidence for SVLR with /ɛ/ in particular could only come from there being a marked length discrepancy before /r/ compared with before /l/; vowels are long before voiced fricatives in other dialects also. This length discrepancy does not seem to be evident in SSE. However, I should at least acknowledge that the account of SVLR given here may be incomplete (in this respect, and possibly others). If SVLR should be attributed to /a/ and /ɛ/, then this may reflect the presence of a in their articulatory gesture (as compared with the other inherently short vowels); a is the equivalent in the articulatory gesture of categorial V (they both promote sonority - cf. e.g. Anderson and Ewen 1987: ch.6), just as ə is equivalent to C.

5. Unlike in (34), Noske et al (1982) associate the long diphthong with the context "before /l/": thus [pa:el] for *pile* (p. 394). This is not supported by other accounts of SVLR; it may represent a regional variant, or an Anglicism. At any rate, for such speakers, the context for this application of SVLR can apparently be simplified by removal of the verticals around the V, (V:C) condition in (34).

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Noske *et al* (1982: 394-7) also claim that with their subjects individual disyllabic lexical items ending in "C + /ə/ + liquid or nasal" show either consistently [a:e] or consistently [ʌɪ] (e.g. [ma:etər] "mitre" but [tʌɪtəl] "title") - i.e. a contrastive distribution. This may represent a lexicalisation with such speakers of a not uncommon variation in the pronunciation of such words, such that a single speaker may have either diphthong in the same item: [sʌɪkəl] as well as [sɑ:ekəl] for *cycle*. If such final liquids and nasals are not syllabic initially, and if SVLR does not (re-) apply after the syllabification of such final liquids, then this would account for the former variant (the vowel is in a syllable closed by a cluster initiated by a non-lengthening consonant); (re-) application of SVLR after syllabification would allow for the latter (the vowel occurs in an open syllable). (Similar considerations may be relevant to the alternation between [wʌɪvz] and [wa:evz] "wives" also discussed by Noske *et al* (1982): the former results if SVLR does not re-apply after /f/ ⇒ /v/ (cf. *wife*); the latter shows re-application of SVLR.)

6. According to Aitken (1981), Scots dialects vary with respect to whether the cognate of /ɔ:/ is susceptible to SVLR. And similar regional (and age) variation may be present in SSE. McClure (1977), for instance, attributes to the Ayrshire subject of his study length differences for /ɔ:/ in accord with SVLR. (However, it is uncertain, on grounds of experimental design, what weight should be accorded to the measurements he records - cf. Agutter in press a, b.) I suspect, too, that in a formal situation, speakers of SSE and other accents and dialects may reflect awareness of morphology in according to the vowel in *clawed* greater length than that in *Claude* (as reflected in Agutter's figures). The situation is also complicated for Scottish speakers by possible awareness of an opposition in other varieties between e.g. the vowels in *gnawed* and *nod*.

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