
Standard English in Edinburgh and Glasgow: the Scottish Vowel Length Rule revealed

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13.1 Introduction

13.1.1 A significant aspect of Scottish sound systems

There are two main reasons for the continuing interest in the synchronic Scottish Vowel Length Rule ('SVLR').¹ Firstly, the SVLR patterns of vowel duration are a key diagnostic of Scots and Scottish English (Aitken 1981b) and have serious ramifications for the analysis of Scottish vowel systems (e.g. Lass 1974; Anderson 1994). Secondly, the combination of morphological, phonological and phonetic aspects of the SVLR raises challenging theoretical questions about the interface between these modules (e.g. McMahon 1991; Carr 1992; Scobbie, Turk & Hewlett 1999), and constitutes a serious challenge for phonetic explanations of allophonic vowel duration (see Keating 1985). Despite the importance of the phenomenon, there is a great deal of confusion as to its operation. This is partly due to the obscurity of the most comprehensive instrumental study to date: Gordon McKenna's unpublished M.Litt. thesis (McKenna 1988). The other factor is that the instrumental phonetic studies of SVLR focus on middle-class Scottish English, while the bulk of non-instrumental work on the SVLR uses rural working-class Scots data. In this paper, we will review these instrumental results, and conclude that there is broad agreement that the Scottish Vowel Length Rule in MC and WC Scottish Standard English applies only to the three vowels /i/, /u/ and /ai/.

This conclusion is apparently at odds with the consensus view of the SVLR in Scots (Johnston 1997b), though it is compatible with individual Scots dialects, such as Berwickshire (Wettstein 1942). It also contradicts the conclusions of A. J. Aitken, whose highly influential paper (Aitken 1981b) addresses mainly Scots, but also, to an extent, Scottish Standard English. Our conclusions, based on firm experimental evidence, therefore have important ramifications for all the descriptive and theoretical work which uncritically applies Aitken's results to Scottish Standard English.

13.1.2 Vowel duration: an overview

Vowel **length** and vowel **duration**² in Scottish varieties of English and in modern vernacular Scots are governed by linguistic systems rather different from those applying in most other dialects of English. The two main distinguishing characteristics of extrinsically conditioned vowel duration (in word-final stressed syllables) are summarised as the parameters (1) and (2), and illustrated for the vowel /u/ in Table 13.1. The question of exactly which vowels alternate is addressed below.

- (1) **Consonantal conditioning.** The typical English pattern of extrinsic vowel duration is that phonetically much shorter allophones of vowels are found before *voiceless* consonants as opposed to *voiced* ones. In Scottish varieties voiced stops condition short duration vowels,³ as indeed do nasals and /l/. Only voiced fricatives (/v ð z ʒ/) and /r/ condition long duration.
- (2) **Morphological conditioning.** Although Scottish varieties follow the typical English pattern of word-final stressed vowels in open syllables having greater duration than the same vowels in closed syllables,⁴ in Scots and Scottish English, consonantal suffixes such as /d/ do not condition shorter vowels. So, while [u] in the open syllable of *brew* is much longer than the comparable vowel in the closed syllable of *brood*, the past tense suffix /d/ in the form *brewed* does not condition a short duration [u]. This gives rise to such famous oppositions as *brood* < *brewed*. These are cases of quasi-phonemic (marginal or derived) contrast (Harris 1995) arising from the interplay of extrinsic vowel duration and suffixation.

13.1.3 Overview

It is hard to give a theoretical account of the SVLR without facing up to the phonetic underpinnings of the phenomenon and the patterns of dialectal variation. Well-designed instrumental studies are essential: a phenomenon consisting

Table 13.1 Broad characterisations, for one representative vowel [u], of the conditioning effects of various contexts

Dialect	Duration	Consonantal context					Morphological context	
		_n	_s	_z	_t	_d	_#	_#d
Scottish English	<i>longer</i>	—	—	bruise	—	—	brew	brewed
	<i>shorter</i>	spoon	Bruce	—	brute	brood	—	—
Anglo English	<i>longer</i>	spoon	—	bruise	—	brood	brew	brewed
	<i>shorter</i>	—	Bruce	—	brute	—	—	—

of subtle differences in vowel duration cannot be adequately addressed using only introspection and transcription. In this chapter, we focus mainly on the phonetics of the SVLR,⁵ which forces us to concentrate on Scottish Standard English, since there are no relevant instrumental studies on Scots, so far as we are aware. The structure of the paper is as follows. In section 13.2, we introduce the dialectal background confronting all phonetic SVLR studies. Thus prepared, in section 13.3 we discuss Aitken's (1981b) original presentation of the rule. In section 13.4 we discuss the results of three instrumental studies into the SVLR system of Scottish Standard English (SSE) (McClure 1977; Agutter 1988; McKenna 1988), and give our own synthesis of their findings. We also make reference to our own ongoing work at Queen Margaret University College, Edinburgh and the University of Edinburgh under ESRC grant R000237135, 'The Scottish Vowel Length Rule: the phonetics, phonology and acquisition of a marginal contrast'. This work in progress includes, to date, the acoustic analysis of data collected from the 32 Glasgow speakers analysed in Stuart-Smith's chapter in the present volume (Scobbie, Turk & Hewlett 1999), and the acoustic analysis of child speech data from Edinburgh (Hewlett, Matthews & Scobbie 1999). In section 13.5 we highlight some important social differences between Edinburgh and Glasgow which we think lead to linguistic differences in MC varieties of SSE, before presenting a summary in section 13.6.

13.2 *The SVLR and the Scots–SSE continuum*

One crucial cause of variation in the SVLR is the relative influence on a speaker's output from Scots *vis-à-vis non-Scottish* accents (notably various varieties of Anglo-English). These influences are often said to form a continuum, linking Scots dialects to Scottish Standard English (Aitken 1979, 1981b; Abercrombie 1979; Macafee 1997). Unfortunately, these end-points are rather nebulous. Scots comprises a range of dialects, and SSE encompasses a range of accents. As Abercrombie and Aitken make clear, SSE may be replete with non-Scottish accent features to the extent that there may be little linguistically Scottish to it. The speech continuum is seen as linking 'varieties of Standard English, spoken *either with RP* or with more or less Scottish accents at one pole and non-standard Scottish dialects at the other pole . . . [The speech on this continuum] which most people in Scotland hear most often . . . in effect is English spoken in some Scottish accent and with an occasional distinctively Scots form or word sprinkled through it' (Aitken 1981a: 74–5, our emphasis). Abercrombie (1979) states that the most linguistically interesting sources of dialectal differentiation are due to differences in phonological inventory and structure. Yet, though they are easy to quantify linguistically, purely phonological differences between dialects are not necessarily very important impressionistically to listeners. Lexical incidence and phonetic variation are more important in this regard: segmental and suprasegmental phonetic production provides

many features which are important as sociolinguistic variables (see Stuart-Smith this volume; Macafee 1997: §12.2).

We focus here on patterns of phonetic vowel duration, making use of the data at our disposal, which have been collected in large part from middle-class speakers of Scottish English. Some MC speakers have phonological systems closer to RP than others (Aitken 1981a; Abercrombie 1979; Macafee 1997) by the presence of RP-like contrasts: /a/–/ɑ/, /ɔ/–/ɒ/, /u/–/ʊ/. These additional tense/lax vowel contrasts and the attendant phonetic reorganisation interfere considerably with the SVLR. Therefore, in discussing the *Scottish* phonetic system of vowel duration, it is important to study one vowel system at a time, beginning with one which is representative of the situation as a whole. We also need to be careful to avoid confusion with Scots phonological systems, for example in the behaviour of /ɔ/, of which more below.

Our discussion, therefore, addresses a single phonological system, of nine monophthongs /i e a ɔ o u ɪ ε ʌ/ and three diphthongs /ai au ɔi/. In principle, such an inventory may be associated with Standard English or with Scots grammar and lexis, whether ‘dense’ or ‘thin’ (McClure 1979). There are two supporting reasons for considering this system. First, it is essentially what Abercrombie (1979) calls the **basic Scottish vowel system**, and he thinks it is reasonable to claim that ‘it is the most *Scottish* of the vowel systems of Standard English in Scotland’ (Abercrombie 1979: 74, emphasis in original).⁶ Second, the speakers in McKenna’s (1988) important study of the SVLR all use this system. **Scottish Standard English (SSE)** in this paper means Standard (or near-Standard) English spoken with this basic vowel system.

Because we are defining Scottish Standard English with *phonological* precision, we must accept that our definition is imprecise sociolinguistically. Specifically, we do not limit SSE to middle-class varieties, a definition which may appear to some to be prescriptively unrealistic. It *would* be possible to define SSE to be Standard English as spoken by a particular group of speakers, namely middle-class ones (though where? – in Edinburgh? – in Glasgow?). But ‘Scottish Standard English’ would then be an oxymoron: the more *standard* the morphology, syntax and lexicon of MC speakers, the less distinctively *Scottish* the accent tends to be (cf. Abercrombie 1979; Aitken 1979).

Another advantage of looking only at the basic vowel system is that social variation in the phonetics can be addressed much more easily. Although most instrumental studies to date have looked only at MC speakers, the Stuart-Smith/SVLR Project word-list data presented in section 13.4.3 includes 16 WC speakers who predominantly use the basic vowel system with different lexical incidence.

13.3 *Aitken’s specification of the SVLR*

Aitken’s work on the synchrony and diachrony of Scottish vowel duration and vowel length is wide-ranging and highly influential, to the extent that the SVLR

is frequently called 'Aitken's Law', especially in its diachronic incarnation. In his major paper on the phenomenon, Aitken (1981b) brings diachronic and synchronic data to bear that relate more towards the Scots end of the spectrum. He does, however, include SSE in his presentation at various points, though his definition of the SVLR as it applies in the *basic* vowel system is not explicitly tabulated but has to be inferred.⁷ Since the instrumental studies which we consider below use speakers of SSE, we will need to apply his results to the SSE basic vowel system, an operation that must be done with caution.

From Aitken (1981b), we need to draw up a candidate set of vowels *from the basic vowel set* that seem likely to undergo the SVLR in SSE. The set in (3) follows closely on Aitken's presentation. It excludes four vowels. Aitken characterises /ɪ/ and /ʌ/ as short in all cases, with which we concur. There is uncertainty about the status of /ɔɪ/.⁸ He also excludes /ɔ/, which is invariably long in some dialects of Scots in a restricted class of L-dropping words such as *fall* and *fault*.

(3) Candidates in SSE for the SVLR (preliminary version): /i e ε a o u ai au/.

This candidate set is unacceptable as it stands. First, in Scots, the word classes LOT, THOUGHT, CLOTH have /ɔ/, so Scots /ɔ/ has an entirely different lexical incidence from SSE /ɔ/, a point of confusion which is usually overlooked (an exception being McKenna 1988: 78). In SSE, we would expect a fully general SVLR to apply to /ɔ/. Aitken includes /ε/ as one of the *alternating* SVLR vowels, but we agree with McMahan (1991) that it ought to be grouped with /ɪ/ and /ʌ/. The low vowel /a/ is said to alternate, but for many MC SSE speakers the morphological conditioning of /a/ is primarily qualitative (*bad* [bad] versus *baa'd* [bad]), so care needs to be taken here. However, even if we accept that there are some points of uncertainty in extrapolating Aitken's presentation to the basic Scottish vowel system (cf. Macafee 1983: 35), *most* vowels in SSE are potentially subject to the SVLR.

(4) Candidate vowel set: /i e a ɔ o u ai au/, plus perhaps: /ɔɪ/.

(5) Candidate environments: 'the long environments are: a following voiced fricative . . . /r/, or a morpheme boundary, all of these either final or followed by a consonant constituting a second morpheme' (Aitken 1981b: 135). In polysyllabic words, hiatus is likely to be a lengthening environment.

But it must not be assumed that (4) and (5) amount to a homogenous 'rule': that all alternating vowels are likely to be equally affected by all triggering environments (see section 13.1). Where Aitken considers variation in Scots and SSE, it is mentioned mainly with respect to the set of input vowels: 'in some (mainly Central Scots?) dialects the Rule seems to operate for all the specified vowels . . . and in all dialects for at least some of the specified vowels . . . Nearly all Scots dialects (and Scottish Standard English) agree in displaying fully long realisations of the affected vowels in these environments' (Aitken 1981b: 134–5). In

fact, since Aitken (1981b) it has been generally accepted that the very *smallest* SVLR set would be /i u/ plus /ai/, though this seems to have been proposed only with respect to morphological conditioning (Wells 1982: 401; Carr 1992: 94).⁹ As noted above, some Scots dialects have only this set (Wettstein 1942). If a larger set undergoes the rule, then /i u/ and /ai/ are often said to follow the rule more 'solidly' (Johnston 1997a: 67) or 'markedly' (Aitken 1981b: 137), whatever that means.

13.4 *Instrumental and experimental data*

Quantitative measurements of vowel duration are neither simple to make nor to interpret. One problem is that the speech sample is typically recorded in a studio, the subject reading aloud from a list. Thus the register is formal and reading-based. Nevertheless, the analysis of laboratory data relating to vowel duration is essential, since an experimental methodology is able to reveal gross perceptible patterns *and* covert patterns of variation. It also avoids a flaw common to all studies that make use of uncontrolled natural dialogues, one particularly problematic for duration-based phenomena: the wide range of conditioning factors (segmental, morphological and prosodic) that affect vowel duration to various degrees.

A second problem with acoustic analysis is the complex relationship between a transcription and a set of spectrographic measurements of the same raw speech data. The transcription of vowel length can make subtle use of many phonetic cues, but instrumental measurement is more mechanistic and is typically based on the segmentation of a waveform or spectrogram. Vowel segmentation criteria are extremely hard to justify and apply in certain cases, for example when an approximant flanks a vowel, or when devoicing of the vowel occurs (due to aspiration, pre-aspiration or glottalisation). McKenna (1988), measuring from waveform and spectrogram (with acoustic feedback), is the only study to give full details of segmentation criteria. They seem appropriate, and his data are well controlled. We conclude that McKenna's work provides the only authoritative raw data on SVLR to date. The other studies merit consideration, however. Firstly, they provide points of comparison; secondly, they are much more widely known; and thirdly, the significance of their results has not been generally understood.

13.4.1 Agutter's study (and McMahon's reanalysis)

Agutter (1988) is a comparative study of two RP speakers and four Edinburgh SSE speakers, all MC undergraduates at Edinburgh University, aged 18–23. Their phonological systems are not indicated. The materials were words in frame sentences, and one token of each word was elicited. Five vowels, /i ɪ ɔ ai au/, were examined in a range of environments. The limited materials were not

controlled for onsets, leading to some pairs that are not properly comparable (e.g. *feed* versus *tee'd*), and judging from the materials and results, we do not consider the data to be particularly reliable. The study is important, however, and deserves careful scrutiny. Basing her hypotheses on Aitken (1981b), Agutter expected /i ai au/ to exhibit SVLR, /i/ to be uniformly short and /ɔ/ uniformly long.¹⁰ Although the paper does include the raw numerical data, Agutter bases her discussion on data *normalised* across speakers. She concludes that 'SVLR applies . . . [but not] that it characterises anything phonetically distinctive of Scots' (Agutter 1988: 129).

McMahon (1991) shows that Agutter's method of reducing speaker variation also reduces cross-dialectal variation. On a reanalysis, although *some* aspects of the Scottish and RP systems still display a common phonetic pattern, which McMahon calls **low level lengthening (LLL)**, other aspects (extra lengthening before voiced fricatives, /ɪ/, pause and /#d/) are systematically distinctive and appear only in Scottish varieties. In RP, only LLL operates. As might be deduced from our presentation in section 13.1, we agree with the spirit of McMahon's subdivision of Aitken's conditioning environment, but not with her specific proposals about low level lengthening, which cross-cut our own division of consonantal and morphological environments. We do not regard the durational system of RP either as 'low level' or as being common to both varieties. Rather, Scottish varieties *and* RP have their own language-specific, partially phonetically motivated systems sitting on top of a more universally natural phonetic base. Indeed, the *small* difference in duration between *feet* and *feed* in Scottish varieties is more likely to be a genuinely 'low level' alternation, i.e. to be no more than a natural result of coarticulation between vowels and voiced/voiceless consonants. Elsewhere, vowel allophony in both dialects is much more systematised, each in its own way. As mentioned above, we have to leave almost untouched the morphophonological and phonological ramifications of the SVLR, and the reader should consult especially McMahon (1991) and Carr (1992) for relevant discussion. We focus here on the phonetic patterns.

McMahon (1991) offers a reanalysis of Agutter's raw data, but in fact her reanalysis partly obscures Agutter's results. Consequently, the patterns in Agutter's raw data have never received proper consideration. McMahon *pools* data for /ai/ and /i/ (both of which are assumed to alternate on the basis of Aitken 1981b), and /ɔ/ and /ɪ/ (both assumed to be non-alternating), to compensate for the impoverished data. But pooling data for these vowels is invalid. First, /ai/ is much longer than /i/ in raw duration. Second, /ai/, being a diphthong, is likely to have less flexibility than /i/ in its durational variation. Third, /ai/ has quality *and* quantity differences in its allophones (short [ai] and long [ae]), but /i/ has only quantitative differences, so again their durational properties are not comparable. Turning to /ɪ/ and /ɔ/: first, /ɪ/ is much shorter than /ɔ/ in raw duration. Second, /ɪ/ cannot occur in open syllables while /ɔ/ is able to. Assuming that this is due to a minimal word constraint, /ɪ/ must be monomoraic ('short') while /ɔ/ is bimoraic ('long'). Third, there are clearly observable differences in duration for /ɔ/ that simply don't apply to /ɪ/: for example, *lot* < *law*. If we simply present a

graph of mean duration calculated from Agutter's raw data (Figure 13.1), the non-congruity of /ai/ and /i/, and /ɔ/ and /ɪ/ can be clearly seen. Additionally, unreliable as the data may be, clear patterns exist.

Most importantly, it emerges that Agutter's study disproved Aitken's (1981b: 133) explicit claim that the SVLR applies to /au/ in SSE, at least with respect to morphological conditioning, a fact that was submerged by Agutter's general conclusions about the SVLR. McMahon (1991: 42) is aware of this result, however, as is Johnston (1997b: 474). So Agutter's study provides an indication that Aitken's SVLR does not transfer in a simple fashion to SSE. Given the lack of further data, McMahon assumes that the SVLR does indeed apply otherwise just as Aitken's account would lead us to expect: it affects /ai/ and /i/ 'and also /u e o/ and perhaps /a ɔɪ/, although these were not tested by Agutter' (McMahon 1991: 44). We agree that neither /au/ nor /ɔ/ is subject to the SVLR in SSE, but conclude that this contradicts Aitken (1981b: 133) *in both cases*. The monomoraic /i/ shows, unsurprisingly, a little durational allophony, but since /i/ cannot undergo morphologically conditioned allophony, it is peripheral to this aspect of the SVLR system. So, in Agutter's study, quasi-phonemic contrast is demonstrated only for /i/ and /ai/.¹¹

We do not have space to consider the phonological conditioning of duration, except to say that no uniform pattern before stops is evident cross-dialectally, and that voiced fricatives tend to lengthen /i au ɪ/ in SSE nearly twice as much as they do in RP. The diphthong /ai/ has similar relative increases in duration in both dialects at approximately 80% (cf. note 11), while /i/ in SSE is nearly 150% longer before a voiced fricative, compared to only 80% in RP.

13.4.2 McKenna's and McClure's studies

Gordon McKenna's unpublished M.Litt. thesis from the Department of Linguistics at Edinburgh University (McKenna 1988) is the most detailed investigation of the SVLR to date. It is explicitly aimed at illuminating the

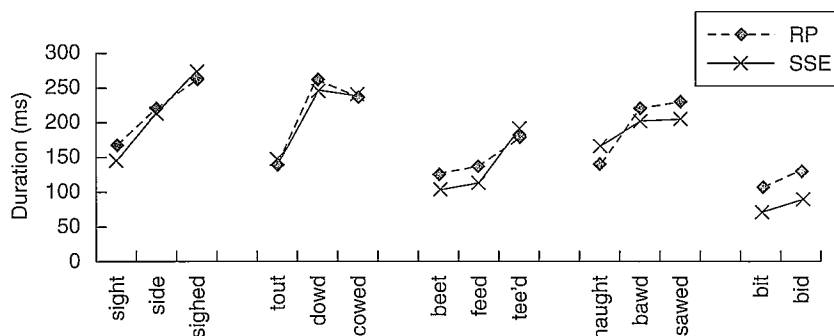


Fig. 13.1 Mean vowel duration before /t/, /d/ and /#d/, for RP (two speakers) and SSE (four speakers), from Agutter (1988)

phenomenon in Scottish Standard English. For comparison purposes we will also look at McClure (1977).¹² McKenna has four SSE subjects, all undergraduates at Edinburgh University, and all with a basic Scottish vowel system. Two are from Edinburgh, one is from Dundee and one is from Dunfermline. Means are calculated from eight tokens (four subjects, two repetitions of each word) spoken in a carrier phrase. We present only the most relevant data, and the reader should consult McKenna (1988) for the full findings. Figure 13.2 illustrates various effects, including intrinsic duration due to vowel height (which arises because lower vowels take longer to articulate) and extrinsic duration due to the manner and voicing of the following consonant. In general, vowels before a voiced consonant are longer than those before the voiceless congener – the general pattern for English and many other languages (Keating 1985). What appears to be specific to Scottish Standard English, however, is the durational behaviour of /i/ and /u/. In comparison with American English (House & Fairbanks 1953), we can see that the close vowels before /d/ and /s/ in particular are of a surprisingly small duration.

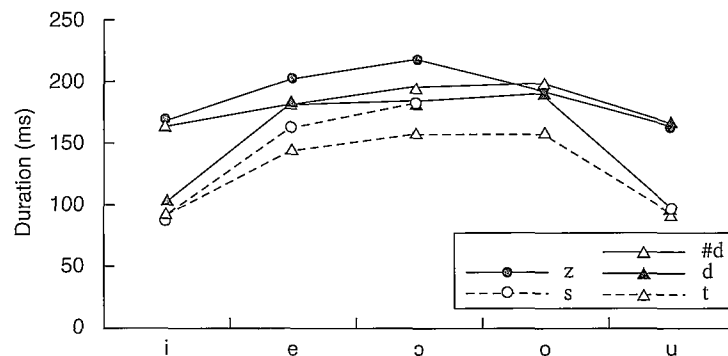


Fig. 13.2 Mean vowel durations in SSE, adapted from McKenna (1988) (note that there are no data for /o/ + /s/)

Let us look first at consonantal conditioning. Figure 13.3a illustrates how the small duration of /i/ and /u/ before /s/ gives rise to a disproportionately large increase in relative duration before /z/. The non-high vowels are only about 20% longer before /z/. On the other hand, the high vowels have *less* of a differential in the stop environment, at only about 10%. Before /d/, the non-high vowels /e o/ are again roughly 20% longer. The non-high vowels in McKenna's study therefore have a small and relatively consistent lengthening effect before *all* voiced obstruents. McClure's data (Figure 13.3b) appear broadly compatible with these observations. In other varieties of English, 'the duration of a vowel preceding a voiced consonant is approximately [50%] greater than that of the same vowel preceding a voiceless consonant' (Lehiste 1996: 228). The peculiarly Scottish aspects of phonological conditioning are that differential vowel duration is large before fricatives, small before stops for /i/ and /u/, and uniformly small in both environments for the non-high vowels.

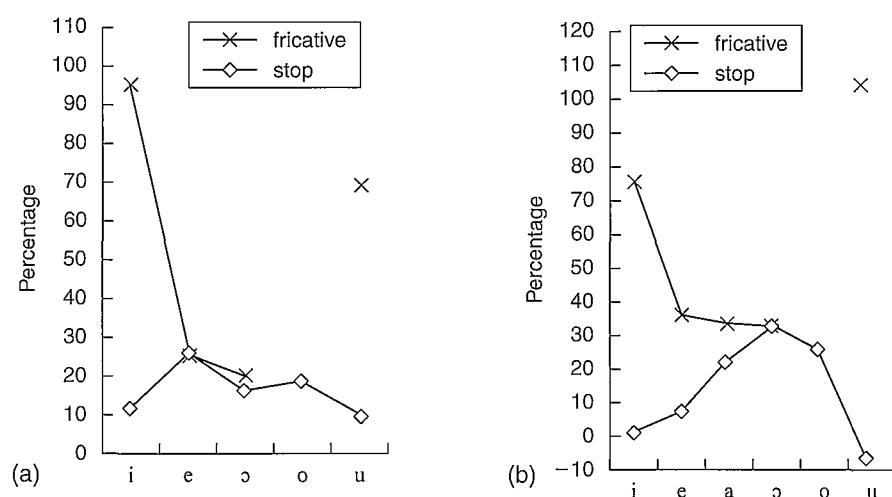


Figure 13.3 Consonantal conditioning of SVLR in SSE: increase in vowel duration in voiced context as a percentage of vowel duration in voiceless context. (a) Calculated from data in McKenna (1988); (b) Calculated from data in McClure (1977), as described in the text

Turning now to the morphological conditioning of vowel duration, Figure 13.4a illustrates McKenna's findings that in SSE only the high vowels /i/ and /u/ can convey quasi-phonemic contrast before /d/ and /#d/, because the non-high vowels /e ə o/ have the same duration before /d/ as they do before /#d/. This means that in SSE the following pairs rhyme: *raid/arrayed*, *odd/lawed*, *road/trowed*.¹³

McKenna interprets McClure's (1977) findings as confirming his own results, and we can indeed see in Figure 13.4 that there is, as in Figure 13.3, a broad agreement between these studies. Indeed, McClure himself notes (p. 16) that /i/ and /u/ (and /ai/ to an extent) differ from the 'other' alternating vowels in being shorter in the short environments and having a more decisive break between shorter and longer allophones. Nevertheless, McClure concludes that his results give 'especially striking' evidence of a durational contrast between such pairs as *pod/pawed* and *toad/towed*. Compared to /i/ and /u/, Aitken found the differences in /e ə a ə ai/ and /au/ 'smaller, but still convincing' (Aitken 1981b: 136). We think, with McKenna, that the putative SVLR differences in /e ə o/ etc. are an artefact of McClure's experimental procedure, due especially to the very slow speech rate. Figure 13.4b suggests that the ratio of /#z/ and /z/, with its consistently low value of around 25%, is also to be disregarded.

To summarise, McKenna's study clearly indicates that *only* /i u ai/ are subject to the SVLR. This is evident both in the consonantal and in the morphological condition. With the benefit of a reliable companion study, McClure (1977) in retrospect leads to the same conclusion.

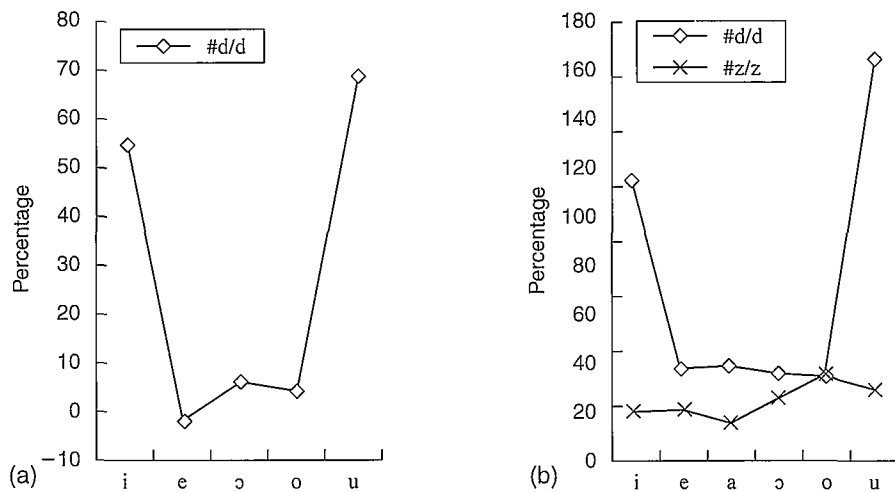


Fig. 13.4 Morphological conditioning of SVLR in SSE: relative vowel duration conditioned by /#d/ and /#z/ expressed as percentage increase, calculated relative to the duration in syllables closed by a tautomorphic /d/ and /z/. (a) Calculated from data in McKenna (1988); (b) Calculated from data in McClure (1977)

13.4.3 The Scottish Vowel Length Rule Project

This project is ongoing, but results available at the time of going to press are worth a brief mention. Hewlett, Matthews & Scobbie (1999) report on an acquisition study of MC children aged 4–9 living in Corstorphine, Edinburgh, focused on the duration of /i/ and /u/ in the consonantal condition. Preliminary results indicate that the children have acquired the SVLR for /i/ and /u/ as follows. Before fricatives, voicing conditions about a 75% increase in vowel duration, but before stops the increase is only about 10%. The chances of acquiring this pattern robustly are reduced, however, in cases where the parents do not have Scottish accents themselves. The failure to acquire SVLR robustly does not imply that the child doesn't use the basic Scottish vowel system, however, indicating that the SVLR may be particularly susceptible to variation and influence from non-Scottish dialects.

Scobbie, Turk & Hewlett (1999) report on a study of the word-list component of the Glasgow data collected by Jane Stuart-Smith (this volume). It focuses on the morphological conditioning of the SVLR, looking at the vowels /ai i u o ə/. From the durational data, *all groups* (see Stuart-Smith this volume) have a statistically significant quasi-phonemic contrast in /i/, /u/ and /ai/ but not in /o/ or /ə/ (Table 13.2).

Spectral analysis reveals no qualitative differences in the monophthongs, other than, perhaps, in the young female WC group, who might be showing a fronted and slight lowered [i] in *agreed* relative to the high and slightly

Table 13.2 Mean vowel duration in ms (32 Glasgow speakers) and the increase in duration before heteromorphemic word-final /#d/ relative to tautomorphemic word-final /d/

Vowel	_d	_#d	% increase
i	123	205	66
u	117	199	70
ai	227	281	24
o	201	193	-4
ɔ	207	222	7

retracted [ɪ] in *greed*. The allophones of /ai/ have *strong* qualitative differences, however, both in *side* and *sighed* and in a pre-fricative context (*ice* versus *eyes*). Before /d/ and /s/, the vowel begins and may end higher and a little fronter than before /#d/ and /#z/ respectively. This can be transcribed broadly as [ɹi] and [æ] respectively. The timing characteristics of the vowels are very different: in [æ] the back-central open or mid-open target is held stable and followed by an off-glide in the direction of [i], whereas in [ɹi], an on-glide coming apparently from the direction of [ɑ] approaches [i] and may be held stable there. Finally, consider how the SVLR conditioning cross-cuts the social variation in /ai/. We will exemplify this with the young female speakers' productions of *icel Spice* and *eyes/spies*. Spectrographic analysis confirms that the first target of the diphthongs is higher for WC than for MC speakers (Table 13.3). Less obviously, the MC speakers have a greater difference in duration (81%) than the WC speakers (53%).

Further analysis is under way of the distribution of /ai/ allophones in the first syllable of disyllabic trochees (*hydro*, *title*, *tidal*, *sidle*, *crisis*, *miser*, etc.) from the word-list. Preliminary results indicate that the choice of allophone before a voiceless fricative may be a sociolinguistic variable. In the word *crisis*, for example, older MC males prefer [æ] while older WC males prefer [ɹi]. Young WC and MC females show a great deal of variability, unlike the other groups. The spectral characteristics of the variants of /ai/ are similar to those of /ai/ in monosyllables, but there appear to be *no* durational generalisations relevant to defining the 'long' and 'short' allophones.

Table 13.3 Typical /ai/ allophones, young Glasgow females, word-list data

	_s	_#z
WC	ɹi	ʌ̃
MC	ɹi	ɛ̃

13.5 *The SVLR and SSE in Edinburgh and Glasgow*

As indicated above in section 13.2, Scottish Standard English as it is normally defined encompasses a range of phonological and phonetic systems. In the extreme case, a small but significant proportion of native Scottish MC speakers use phonological and phonetic systems which are near-RP. This is observable in the speech of, for example, some MPs and lawyers. Formal broadcast Scottish English is often nearer to RP than to either of the MC varieties tabulated in this volume (Stuart-Smith's 'Glasgow Standard' and Chirrey's 'Edinburgh English'). Based on informal observation we think there is a greater amount of near-RP speech amongst the Edinburgh middle class than there is in Glasgow, but until comparative data are collected, we cannot be sure how this affects the SVLR.

There are various contemporary and historical differences between the middle classes in these cities which would lead us to expect a greater influence of Anglo English on the Edinburgh middle class. The 1991 Census shows that Edinburgh has more middle-class residents, and more English residents. While Edinburgh has 38% of residents in social groups I, II and IIIN, Glasgow has only 22%. Edinburgh has 9.5% residents born in England (39,682) while Glasgow, Bearsden and Milngavie combined have only 3.5% (24,275).¹⁴ These proportions are not unrelated, since 'most English families settling in Scotland are well educated and tend to be employed in high-status jobs': results from the ESRC Scottish Devolution Referendum Project (R000237374) indicate that in 1997, 23% of Scottish residents born in Scotland had a higher education qualification compared to 38% of Scottish residents who were born in England, and that similar results hold for occupation (Lindsay Paterson, personal communication). The record of births at the General Register Office for Scotland contains information about the social class and country of birth of the child's parents: these records show a similar correlation between middle-class occupation and an English birthplace. Looking just at a subset of children (about 75% of the MC total) who were born into a Scottish, English or mixed Scottish/English family with a 'professional' or 'executive' parent (social class codes 1 and 2) in 1997, we see that in Edinburgh, 23% (633/2,728) have at least one English parent, while in Glasgow, Bearsden and Milngavie, only 12% do. There is also a much higher proportion of children in Edinburgh who attend independent schools (Scottish Office, personal communication), as shown in Table 13.4. Taking these demographic trends together, we predict that MC SSE in Edinburgh will be further along the continuum towards RP as a result of the greater exposure of the Scottish MC to MC Anglo-English models.

The potential Anglo-English influence on Scottish students in higher education should also be considered, especially since McKenna's and Agutter's subjects were drawn from this pool. Edinburgh University hosts a much larger proportion of Anglo-English students than Glasgow University (Table 13.5) (EU website <http://www.cpa.ed.ac.uk/facts/18/12/98>; GU website <http://www.gla.ac.uk/Otherdepts/IPS/FastFacts/studentn.htm> 18/12/98). We do

Table 13.4 Numbers of school pupils in schools run by City of Edinburgh and Glasgow City Council and in independent schools in those areas

	Edinburgh City, Sept. 1997		Glasgow City, Sept. 1997	
	State	Independent	State	Independent
Primary	30,590	4,055 (12%)	49,439	2,509 (5%)
Secondary	18,714	6,136 (25%)	29,952	4,108 (12%)
Total	49,304	10,191 (17%)	79,391	6,617 (8%)

Table 13.5 Residency of students at Edinburgh University and Glasgow University

Home residence	EU students (full and part-time) 1997–98 (%)	GU students (full-time) 1996–97 (%)
Scotland	43	71
Rest of the UK	40	16

not know whether Agutter's (1988) MC Edinburgh speakers had the basic Scottish vowel system. McKenna (1988) used a questionnaire to make sure that his Edinburgh MC subjects had a basic Scottish system, meaning that we can be confident of his results providing a valid picture of MC SSE as *we* have defined it, in terms of the basic Scottish vowel system, making his results likely to be applicable in the Glasgow context too.

In conclusion, we think it likely that if Stuart-Smith's study were repeated in Edinburgh, more of the MC speakers would have non-Scottish contrasts supplementing Abercrombie's basic Scottish system than she found in Bearsden. There is great potential for interesting comparisons to be made between the MC varieties of Edinburgh and Glasgow, and between the speech of Scottish children at state and independent schools in each city. Casual observation in Edinburgh and Glasgow of pupils from independent schools indicates, for example, that RP-like non-rhoticity has a higher incidence in Edinburgh independent schools, which may indicate, in combination with Stuart-Smith's results, that rhoticity is retreating in more than one sociolinguistic group.

13.6 Conclusions

We have reviewed and reinterpreted the available instrumental experimental phonetic data on the SVLR. Most of the subjects investigated spoke Scottish Standard English with Abercrombie's (1979) basic Scottish vowel system, including all four subjects in McKenna (1988), our major source.

Morphologically conditioned quasi-phonemic contrasts in duration have been observed for the high bimoraic vowels /i/ and /u/, and the diphthong /ai/. The diphthongal contrast is less in degree, but is accompanied by strong qualitative cues. A contrast has been shown to be absent for /e ɔ o/ and /au/ (and /a/ in McClure's Ayrshire data), and it cannot be conditioned for /ε ɪ ʌ/. We can conclude on this basis that the morphological pattern of the SVLR affects only /i/, /u/ and /ai/ in Scottish Standard English. Little is known about the consonantal conditioning of vowel duration before non-alveolar consonants, but before alveolar stops and fricatives it is clear that high vowels pattern very differently from non-high vowels: /i/ and /u/ are particularly short before /t/, /d/ and /s/, but /ai/ shows less extreme durational variation. In polysyllabic words, indeed, the two qualitative variants of /ai/ may not differ in duration at all, only in quality.

Variation in the SVLR can reveal much of interest. Our ongoing analysis of /ai/ in the Glasgow data is beginning to reveal interesting preliminary results. The SVLR is susceptible to pressure from non-Scottish varieties, as shown in acquisition by Hewlett *et al.* (1999). Given the result, and the demographic situations in Glasgow and Edinburgh, child language acquisition in Scotland emerges as an area of important future research.

Our analysis runs counter to other accounts that imply or claim a much wider applicability for the SVLR. One of the implications of our analysis is that phonological analyses of the basic Scottish vowel system will have to be redrawn, with a much smaller role for the SVLR. Moreover, the literature leads us to expect that other Scottish systems will exhibit more general SVLR patterns, but clearly, given the history of research into this phenomenon, the status of the SVLR in other varieties must be regarded as less than settled. More instrumental phonetic research is urgently required.

Notes

- 1 We acknowledge the support of ESRC grant R000237135. Thanks are due to the editors for their encouragement. Thanks also to Jane Stuart-Smith, April McMahon, Gerry Docherty and Ben Matthews for discussion and comments, to Lindsay Paterson (University of Edinburgh) and Ian Brown (GROS) for their help with materials for section 13.5, and to our subjects and their families.
- 2 We attempt to avoid terminological and conceptual confusion as follows. The terms **long** and **short** imply a categorical phonological opposition of **length**. The terms **duration**, **durationally long** and **durationally short** imply relative amounts of real phonetic time, and the comparative adjectives **longer** and **shorter** also refer to phonetic duration.
- 3 More precisely, vowels before tautomorphic voiced coda stops are only barely longer than the comparable vowels before cognate voiceless stops, suggesting that the residual, low level difference is irreducible.
- 4 Due to the interaction with segmental conditioning, vowels in closed syllables are markedly shorter only if the closing consonant is a stop, nasal, voiceless fricative or /l/. Syllables closed by voiced continuants seem to be comparable in duration to open syllables. The behaviour of closing clusters is unclear.
- 5 We concentrate on patterns of duration and have relatively little to say about phono

logical length. We will see that the basic Scottish vowel system has a reduced role for length as a contrastive phonological feature. There are only three unquestionably short vowels (i.e. monomoraic vowels that cannot appear in open syllables), namely /ɪ ɛ ʌ/ (KIT, DRESS, STRUT). We assume that the other vowels are bimoraic, i.e. long, though nothing hangs on that here. The status of length in Scottish varieties is controversial, a situation caused in large part by the complex phonetic-phonological-morphological systems governing vowel duration.

- 6 This system derives historically from the varieties of Scots spoken in the Central Lowlands encompassing Glasgow and Edinburgh.
- 7 Since our description of the SVLR in this paper concentrates on SSE and the basic system, we cannot devote the necessary space to consideration of specifically Scots vowels such as /ø/. Nor can we consider properly here the complex behaviour of /ai/, the SVLR-governed allophony of which ([ʌi ~ ae]) exists in Scots alongside a contrast between /ʌi/ and /ae/ (and /e/) in one lengthening environment: stressed open syllables with the cognate suffixed forms (e.g. [pʌi] *pay*, [pʌid] *paid*). The SVLR behaviour of Scots phonemes /ae/ and /ʌi/ is the same as for the single SSE phoneme /ai/ in all other environments. Even in the open syllable environment, Scots /ae/, in *pie*, for example, acts just like SSE /ai/. The single difference is that Scots-influenced speech also permits [ʌi] with a different lexical incidence from SSE /ae/ to appear. Interestingly, the behaviour of /ai/ in SSE in polysyllabic words is also suggestive of a phonemic split. See Aitken (1981b) who makes this point and Scobbie *et al.* (1999) for some acoustic data. Aitken should also be consulted for his discussion of morphophonological data, especially /ai/ again in plurals like /lʌivz/ *lives* rather than /laivz/ with a longer duration allophone.
- 8 In Scots, many (most?) CHOICE words in SVLR shortening environments (e.g. *join*, *oil*, *choice*) have /ʌi/ (see note 7). Aitken notes that /ɔi/ may be invariably long in some dialects of Scots, as [oe]. Our informal observations suggest that [oe] production (which can sound disyllabic in open syllables) appears mainly in SVLR long environments. Such SVLR-related patterning of lexical incidence echoes the distribution of /ae/ and /ʌi/.
- 9 Allophony of /ai/ permeates into the north of England, in rural (Kolb, Glauser, Elmer & Stamm 1979) and urban speech (J. Milroy 1995).
- 10 This is a mistaken reading of Aitken (1981b). See section 13.3 for discussion of /ɔ/. In SSE, LOT, CLOTH, THOUGHT *do* have /ɔ/ and it is observably not uniformly long. McMahon (1991) perpetuates Agutter's error.
- 11 Note that /ai/ is similar in duration in the 'short' *side* and 'long' *sighed* environments in both dialects, indicating the crucial importance of the *quality* difference between [ʌi] and [ae] in SSE.
- 12 The experimental materials are similar in both studies, and both consider MC SSE. McClure's (1977) study examines a single speaker, the author himself (Ayrshire), so it in turn needs to be examined in the context of McKenna's more reliable study. While McKenna (1988) is obscure, McClure's (1977) study is cited much more widely, e.g. in Wells (1982). Our presentation of McClure (1977) uses values which are the mean of his in-isolation mean (N = 2) and his sentential measurement (N = 1).
- 13 Presumably *rode* and *rowed* are homophonous, giving one less morphophonological alternation for the Lexical Phonologist to worry about (e.g. Carr 1992).
- 14 Bearsden and Milngavie are not and have not been part of the City of Glasgow Council.