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Scottish English and The Scottish Vowel Length Rule – An Empirical Study of Ayrshire Speakers

Résumé :
Cet article présente une étude empirique de quelques traits caractéristiques de l'anglais parlé en Ayrshire en Ecosse en s'appuyant sur un corpus oral de locuteurs contemporains. Nous aborderons notamment les phénomènes d'allongement vocalique en anglais d'Ecosse (à savoir ce que l'on appelle habituellement la Scottish Vowel Length Rule) en explorant son application réelle chez des locuteurs de l'Ayrshire et à la lumière de divers travaux antérieurs. Nous offrirons enfin une interprétation théorique du phénomène et nous avancerons quelques arguments en faveur d'une intégration de la longueur à la représentation phonologique des voyelles de l'anglais écossais.

0   Introduction

This paper explores some of the characteristics of Scottish English with particular attention to the uncertain status of vowel length and the operation of the so-called Scottish Vowel Length Rule. First, it presents some descriptive material based on empirical research on accent variation in Ayrshire (Scotland) and offers a glimpse of the extensive and varied data obtained within the *PAC* project (see Carr, Durand & Pukli this vol.). Section 2 inquires into the role played by the Scottish Vowel Length Rule (henceforth SVLR) a particular durational alternation that operates in most Scottish accents. A brief analysis is presented of the extent to which data from contemporary speakers in Ayrshire corroborates traditional descriptions and previous empirical findings. Finally, in Section 3, we turn our attention to the theoretical implications of the SVLR.

It lies outside the scope of the present paper to discuss the complexities of English in Scotland and the intricate socio-regional variation between Scots and (standard) English spoken with a Scottish accent. Therefore, the term 'Scottish English' will be used throughout the paper to cover in fact a range of varieties of English spoken with a range of different accents, knowing that it is quite inadequate both synchronically and diachronically (see Durand this vol., Ford this vol. and Colman this vol.).

Transcriptions are given using standard IPA symbols, in /slant brackets/ for phonemic and in [square brackets] for phonetic transcription, SMALL CAPS designate lexical sets taken from Wells (1982), and items from the corpus and other examples in spelling are in *italics*.

1   The phonology of Ayrshire speakers

Our corpus of Ayrshire speakers represents a great amount of data and extensive input for phonological analysis. It provides a firm basis for our foremost aims in the *PAC* project: establishing a phonological inventory shared by all

speakers, creating a detailed phonemic/allophonic portrait for each informant and revealing phonetic and sociolinguistic variation within the group. (For the methodology and the fundamental principles of the *PAC* project see Carr, Durand & Pukli and Durand & Pukli this vol. For an overview of the phonemic system of Scottish English see Durand this vol., and for recent instrumental studies on Glasgow and Edinburgh English see the collection in Foulkes & Docherty (1999)).

1.1 The Ayrshire corpus

Data collection took place between 2001-2002 in Ayrshire, Scotland. There are altogether seventeen informants (10 female - 7 male speakers between 18 and 70 years of age) who were born and raised in Ayrshire and currently reside there. They all come either from the town of Ayr or its immediate surroundings (Prestwick, Troon, Irvine and Annbank). Since there is considerable accent variation within Ayrshire, it is important to note that by using the terms 'Ayrshire English' or 'Ayrshire speakers' in this paper, we will refer exclusively to our group of speakers and make no claim that our data encompasses all the diversity attested within a town like Ayr and even less in the whole of Ayrshire.

The sampling criteria for speakers were set according to the *PAC* project protocol (see Carr, Durand & Pukli this volume), but two elderly (60+) speakers have been retained at this stage of analysis, despite the fact that they have moved about considerably during their adult life. Relative geographical stability (no more than one year spent outside Ayr/Ayrshire) is true for the rest of the informants. The data discussed in this paper comes from the two *PAC* wordlists (controlled reading of isolated items in a list) unless otherwise stated.

1.2 The phonemic system – a few interesting features

1) *loch – lock*, *which – witch*

Contrastive use of the two classic Scottish consonants /x/ and /ʍ/ is attested in the corpus. Almost all speakers pronounce /lɔx/ vs. /lɔk/ for *loch* and *lock*, and /ʍɪtʃ/ vs. /wɪtʃ/ for *which* and *witch* (see Durand this vol. for comments on these oppositions). Interestingly, one young male informant has a homophonous pair for *loch* and *lock*, and three subjects (once again, young speakers) do not distinguish *which* from *witch*. Furthermore, only one speaker of the three and only once pronounces /ʍ/ out of its nine possible occurrences in the reading passage. This seems to indicate that previous accounts of phoneme loss (cf. Stuart-Smith 1999, Chirrey 1999, Stuart-Smith and Tweedie 2001) in other regions of Scotland might be true for younger speakers in Ayrshire.

2) *rhoticity*

A wide range of phonetic realisations is found in the corpus, form post-alveolar or retroflex approximants and fricatives to slightly rolled and one-tap r's. Vocalized variants and complete loss of /r/ in coda position as in *far*, *war*, *moor*, *board*, *bard*, *fierce*, etc. also occur, at least with three young speakers, but the exact distribution and frequency of this zero realisation is yet to be established. Earlier reports indicated possible r-loss in the younger generation in Edinburgh (Romaine

1978) and Glasgow (Stuart-Smith & Tweedie 2001), and this might be another novel feature of Scottish English present in Ayrshire.

3)   *liquid clusters*
In Scottish English, liquid and liquid + nasal clusters are often broken up by the insertion of a vocalic element. This typical realisation is widely attested in our corpus, for example in spontaneous speech: *arm* [ˈarʌm], *world* [ˈwʌrʌld], *film* [ˈfɪlʌm]. In the wordlist, *pearl* and *peril* are homophonous for twelve speakers out of seventeen. *Furl* is pronounced [ˈfʌrʌl]/[ˈfʌrəl] by seven subjects (for seven others the lateral is vocalised and the word is pronounced [ˈfʌrʊ]).

4)   *the vowel system*
Most of the informants seem to have the so called 'basic' system (Abercrombie 1979) of 9 monophthongs and 3 diphthongs - /i, ɪ, ɛ, e, a, ʌ, ɔ, o, u, ai, au, ɔi/. *Full* and *fool* are homophonous for all the speakers of the corpus, while two persons contrast *ants* and *aunts*, and two other speakers seem to distinguish *cot* from *caught*. The consistent use of such contrasts has to be confirmed by an exhaustive allophonic analysis for the wordlist items and for other stylistic contexts as well.

One further aspect of the Scottish English vowel system – widely cited in phonological description and theory – is the Scottish Vowel Length Rule. Additional wordlist data was collected in order to more thoroughly explore this phenomenon, which is discussed separately in the next section.

2   The Scottish Vowel Length Rule

In most English accents, the stressed syllables in *greed* and *agreed*, *brood* and *brewed*, *side* and *sighed* are pronounced in the same way, despite having a different morphological make-up. In Scotland, however, these pairs are not homophonous: they are markedly distinct with a shorter vowel in the monomorphemic word and a longer vowel in the morphologically complex word. These minimal pairs taken from the *PAC* wordlist illustrate what is known as the Scottish Vowel Length Rule, or Aitken's Law.

In very simple terms, according to the SVLR there will occur:

a short vowel / _ p, t, k,   b, d, g,   tʃ, dʒ,   f, θ, s, ʃ   m, n, ŋ,   l,
a long vowel / _   v, ð, z, ʒ   r
              _ #

Thus the vowel sound in *troop, shoot*, *spook*, *tube*, *rude*, *Krug*, *smooch*, *huge*, *hoof*, *tooth*, *loose*, *bush*, *room*, *rune*, *rule* will be considerably shorter than in *move*, *smooth*, *lose*, *rouge*. At the end of the word the vowel has its longer variant (even if a so-called 'weak' suffix is added and the vowel is no longer word-final), e.g. *brew*, *blue*, *brewed*, *blueness*.

Simple as it may seem, the phonological description and interpretation of the SVLR is not without hurdles. Perhaps the three most fundamental questions

concern 1) the precise composition of the input, i.e. the vowel phonemes that undergo durational alternation, 2) the reason why SVLR happens in this particular context, 3) the status length enjoys in the phonemic system, i.e. whether the durational phenomenon should be described as a process of shortening of long vowels, a lengthening of short vowels, or as an allophonic variation of vowels which are unspecified for length. While the last two points are best treated in a theoretical context and will be examined in section 3, first we can have a look at some empirical evidence below to elucidate the first question concerning the input vowels.

Interestingly, there is a lot of confusion in the literature about the vowel set the SVLR operates on (for a more comprehensive review see Scobbie et al. 1999). Aitken's (1981) detailed description of the 'Rule' concerned principally Scots (with a considerably different phonemic system) and, transposed to English, the durational alternation involved possibly all vowels except /ɪ, ʌ/. This view was then taken up in Wells (1982) for Scottish English, who also cites McClure's study (1977) on Ayrshire English confirming the participation of the same vowel set. Other accounts propose tense vowels /i, e, a, u, o, ɔ/ and /ai/ for Scottish English (Giegerich 1992), /i, e, u, o/ and /ai/ plus sometimes /a, ɔ/ for Scots and Scottish English (McMahon 1991) and /i, e, u, o, ɔ/ and /ai/ for Edinburgh Scots (Carr 1992). Confusingly, it is rarely discussed in explicit terms how the originally Scots phenomenon should be best formulated for Scottish English and if it changes along the complex socio-regional continuum that lies between Scots and standard English with a Scottish accent.

In fact, recent empirical studies have shown that the operation of the SVLR in Scottish English might be more restricted than hitherto assumed. For instance, an examination of four middle-class speakers from East-Central Scotland confirmed the alternation of only /i/ and /u/ among the monophthongs (McKenna 1988). Further instrumental findings for 32 middle-class and working-class speakers from Glasgow demonstrated that among /i, u, o, ɔ, ai/ only /i, u/ and /ai/ alternate in the SVLR context (Scobbie, Hewlett & Turk 1999). There is, however, no comprehensive instrumental survey available for the *entire vowel* set in any region, and the number of speakers examined remains relatively small.

Therefore, a full-scale investigation involving all the vowel sounds of Scottish English seemed necessary for an appropriate formulation of the SVLR in Ayrshire (for this part of Scotland the principle source of empirical information is instrumental data by McClure (1977), unfortunately based on one informant that happened to be the author himself.) A list of 67 words in random order without repetition was recorded for 11 speakers of our corpus in addition to the standard *PAC* protocol. It tested the nine monophthongs and three diphthongs of the basic Scottish English vowel system in the following contexts: _ t, _ d, _#d, _# (e.g.: for /ai/ *tight*, *tide*, *tied*, *tie*; for /e/ *late*, *lade*, *laid*, *lay*). The paradigm was not complete for /a/, and for the checked vowels /ɪ, ʌ, ɛ/ (more on this distributional particularity in Section 3), and it was not always perfectly controlled for the onset consonants (generally assumed not to be a relevant factor phonologically, despite the fact that they are sometimes problematic for an acoustic analysis).

Preliminary results are complex and contradictory. Measurements are based on spectrographic analysis, but have not been completed for all speakers and all types of data. The first findings for four subjects suggest that 1) in terms of relative length increase /u/ is markedly (more than a hundred per cent) longer before the past tense suffix and word-finally in *brewed* and *brew* than it is in *brood*, and before the voiced fricative in *hooves* vs. *hoof* and *hoofs*; 2) around fifty per cent longer are /o/ and /ɔ/ before the past tense suffix and word-finally; 3) /au/ and /ɔi/ show remarkable stability in the four contexts (_ t, _ d, _#d, _#) with a maximum of around thirty per cent of relative increase morpheme and word-finally. (Results were not interpretable for /e/, and no data is available at the moment for the checked vowels and /a/; for that and other word-set types see Pukli in progress.)

Also, in most cases there appears to be a clear qualitative difference between *side* [sʌiˑd] vs. *sighed* [saˑid] and *tide* [tʌiˑd] vs. *tied* [taˑid] that needs precise formant analysis. Both auditory impressions and available instrumental study (Scobbie et al. 1999b) indicate that the timing of the two sounds within the diphthong is not similar: the first part, [a], takes longer to rise towards [i] in *sigh*, *sighed*, *tie*, *tied*, than in *side* and *tide*, where the diphthong approaches very rapidly the [i] region and is held quite stable there (hence the half-long notation in the phonetic description to mark the more stable part of the diphthong). Durational increase between the two variants of the diphthong is around fifty per cent in the corpus (*tide* vs. *tied* and *tie*).

Contradictory results were obtained for /i/. Data from all eleven speakers showed that *neat*, *need* and *kneed* were of virtually equal duration and only word-finally (in *knee*) was there a massive increase (of around 150 per cent). On the other hand, the relative increase between *greed* and *agreed* was of more than 120 per cent. This might either be indicative of a flaw in the methodology (ill-chosen word) or perhaps of an unpredictable lexicalisation of shorter-longer variants.

It has to be emphasized that none of the above mentioned findings can be considered final since only four out of eleven speakers have been analysed and results have not been submitted to statistical testing. Our provisional conclusions are the following: /u, ai/ appear to be subject to SVLR alternation; /o, ɔ/ vary much less; /au, ɔi/ show practically no durational variation (though formant analysis is needed to determine if any qualitative change takes place); and more items need to be analysed for /i/. Lengthening due to voicing (_ t vs. _ d) seems to vary between 0 to 30 per cent. At this preliminary stage, no attempt has been made to detect gender, age or socially conditioned variation among the speakers.

3   Theoretical implications

The theoretical implications of the durational alternation due to the Scottish Vowel Length Rule are more intriguing than it may seem at first sight, and the 'Rule' has serious repercussions at the phonological level.

The apparent evidence that some of the vowels have shorter and longer variants suggests that durational specification should at some level be encoded in

the phonology of Scottish English. Yet, there can never occur a distinction between for instance a short and a long /u/ in an otherwise identical segmental context in morphologically simple words. In other words, there are no monomorphemic minimal pairs where the two variants would contrast, which suggests that phonemes are not specified for length. Short-long realisations are in complementary distribution, i.e. the durational alternation is introduced at the allophonic level in a system which apparently lacks any length specifications at the phonemic level: e.g. /u/ with [ʉ] and [ʉː] as allophones.

However, this view will have to be reassessed in the light of two further considerations. First, there are well-known distributional restrictions and minimal word constraints for Scottish English, just as there are in other accents of English, according to which not all vowel sounds in a given phonemic system can appear in an open syllable in stressed position word-finally or in monosyllabic words. In Scottish English *knee* /ni/, *lay* /le/, *claw* /klɔ/, *show* /ʃo/, *brew* /bru/, *tie* /tai/, *cow* /kau/, *boy* /bɔi/ are all well-formed words, while */bɪ/ and */bʌ/ are not. /ɛ/ and /a/ are more problematic in the sense that their distribution at the end of the word is very restricted: /ɛ/ occurs exclusively in such onomatopoeic words as *meh*, while *bra*, *spa*, *bah*, etc. constitute a very small – but lexical – set in English (cf. the PALM set in Wells, 1982). We can thus say that distributional factors seem to divide the vowel set in two: /ɪ, ʌ, ɛ/ vs. /i, e, a, ɔ, o, u, ai, au, ɔi/.

How can we account for this asymmetric distribution? For other accents of English a similar, two-way division can be explained by vowel length. A nucleus with a long vowel forms a heavy syllable (or two morae) even without a coda consonant, whereas a short vowel constitutes a light syllable (or one mora) if there is no coda consonant. One could imagine that the same holds true for Scottish English, /ɪ, ʌ, ɛ/ are monomoraic, and /i, e, a, ɔ, o, u, ai, au, ɔi/ are bimoraic despite the fact that quite often some of them are pronounced short. (For a similar position see Scobbie et al. 1999a.)

Second, Scottish English has mainly the same stress patterns as do other accents in the British Isles. Stress placement is complex, and a rather controversial domain in phonological theory, but traditionally stress at the word level is explained and predicted by three principles: the syntactic category of words, their morphological structure, and their phonological make-up, principally syllable weight. So far as syllable weight is concerned, one would expect a radically different stress pattern in Scottish English if it really did have uniform length, i.e. a system where all the monophthongs correspond to one time unit and diphthongs correspond to two time units. Yet Scottish English stress is barely different from other British accents. If, on the other hand, we assume that /i, e, a, ɔ, o, u/ and the diphthongs are inherently long (bimoraic), then analyses of English stress based on weight or mora-structure will be valid for the Scottish accent as well.

Both vowel distribution and stress placement appear to suggest that Scottish English has long /iː, eː, aː, ɔː, oː, uː, ai, au, ɔi/ and short /ɪ, ʌ, ɛ/ vowels. This, rather 'abstract' vowel length (or weight) does not always correspond directly to phonetic reality, but for some vowels it surfaces in clearly recognizable

longer-shorter variants. The SVLR would thus operate on a sub-set of long vowels, shortening them before plosives, voiceless fricatives, nasals and the lateral. (See Anderson (1988, 1993) for a similar interpretation of inherently long vowels, and McMahon (1991) and Carr (1992) for a different approach involving the SVLR lengthening of short vowels.)

Finally, let us turn our attention to the segmental context where the durational alternation occurs. A sub-set of the long vowels of Scottish English shortens when followed by plosives, voiceless fricatives, nasals and the lateral but preserves their length when preceding voiced fricatives and /r/. But why should voiced fricatives and /r/ fail to trigger shortening, and how are they different from the rest of the consonants?

At first sight they do not constitute a natural class either in terms of articulation or in terms of the sonority hierarchy. A temptingly painless way to characterize them would be to consider /r/ as a voiced fricative (which is one of the many allophones of the phoneme). In order to support such a radical re-grouping of the liquids one should find some further, independent motivation from other domains of Scottish English phonology. Equally appealing is the option to group them together as voiced continuants, but again one would have to justify what happens to /l/, whether its re-categorization as a non-continuant (lateral contact on the palate) can be properly justified.

Yet, although there seems to be no foolproof way describe the uniting feature(s) of voiced fricatives and /r/, the same set of consonants is involved in durational phenomena in Quebec French and in traditional descriptions of Standard French as well. (See Montreuil this vol. for a comparison of Quebec French, RP, GA and Scottish English in Moraic Theory.)

There are several questions that remain open. How does syllable-final position affect length alternations (e.g. the monomorphemic *Lucy*, *lupin* and the bimorphemic *Souness*, *soonest*, *cubist*), and what effect does this have on phonological description? What motivation can there be for the /ai/ diphthong to have the same behaviour as that of /i/ and /u/ (or other, extended sets of monophthongs)? To what extent can we talk about the same behaviour, since the diphthong seems to come near to a phonemic split with a highly complex distribution in polysyllabic words, not to mention the representational complication a shortened (monomoraic) diphthong creates.

4   Conclusion

We have illustrated the main challenges the Scottish Vowel Length Rule represents for phonological theory and have argued that there is good (independent phonological) reason to believe that Scottish English vowels are inherently long, and that some of them are shortened allophonically as predicted by the 'Rule'.

Hopefully further results from the Ayrshire corpus will help shed more light on the vowel system of the speakers and the exact operation of the SVLR, which, widely cited as it is in phonological theory, deserves to be more documented especially with regard to regional and social variation. We trust our

work can eventually, if to a modest extent, contribute to recent efforts in the descriptive-analytical linguistic research following in the footsteps of Trudgill (1978), Hughes & Trudgill (1979) and Wells (1982).

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