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Glasgow and the Central Belt

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1 Introduction

The vernacular of the Scottish Central Belt, stretching between Edinburgh and Glasgow, where the majority of the Scottish population live, is thought to have undergone radical changes during the course of the twentieth century (e.g. Johnston 1997; Macaulay 2014). This chapter presents results from an ongoing study of what we believe to be the earliest existing recordings from Glasgow and Central Belt Scottish English, namely the subset of young men from this area who were recorded in German Prisoner of War camps during World War I by Wilhelm Doegen, and which now form part of the British Library's *Berliner Lautarchiv British & Commonwealth Recordings* collection. Impressionistic auditory analysis was carried out on the speech of eight speakers, with particular emphasis on T-glottalling and rhotics. The speech of three of the western Central Belt men, two speakers from Glasgow and one from the countryside outside the city, was further subjected to acoustic analysis of specific features, particularly the quality and duration of the stressed monophthongs and /ai/, and word-initial /l/; the results of the acoustic analysis are given in an accompanying paper, and are not discussed further here (see Stuart-Smith et al forthcoming).

The chapter has two aims. After discussing the materials and our methods for analysing the recordings (Sections 2 and 3), we give first a very brief phonetic sketch of early Scottish English as attested in these speakers, with a more detailed outline of T-glottalling and the realization of /r/ (Section 4). Our second aim (Section 5) is to consider the evidence for real-time change across the century, by focussing on coda /r/. In order to do this, we compare the new results from the Berliner Lautarchiv speakers with findings from previous and current projects on phonological variation and change in Glasgow and the Central Belt. These reveal that the derhoticisation of coda /r/ observed in sociolinguistic surveys since the late 1970s appears to be rather more gradual than has been supposed, though impressions of the progress of derhoticisation also differ depending on the kind of comparison that can be made. This study of coda /r/ constitutes the theoretical contribution from this chapter: our appreciation of sound change depends on the resolution of the time period with which we view it (cf Milroy 2003; Gregersen 2014).

2 Materials and resources

This chapter focuses on what seem to be the earliest extant recordings of vernacular Scottish English. Since Aitken (1984), Scottish English is generally considered to be a sociolinguistic continuum of varieties, ranging from Scottish Standard English (SSE), spoken by middle-class speakers, and Scots vernacular, spoken by working-

class speakers (e.g. Macafee 1997; Stuart-Smith 2003; Corbett and Stuart-Smith 2012). In rural areas speakers often switch between SSE and the local dialect, but in urban areas, and particularly the Central Belt of Scotland, it is more common for speakers to drift up and down the continuum depending on context and interlocutor (Stuart-Smith 2003).

Until recently urban vernacular varieties of Scottish English have been highly stigmatized, with the result that searches for recordings made before the late 1960s have yielded very little indeed. The Sound Archive at the School of Scottish Studies, University of Edinburgh, mainly has traditional rural dialect recordings and songs. The Scottish Screen Archive of the National Library of Scotland has a substantial collection of films of different kinds, from news reports to locally-made films, recording different aspects of life in the Central Belt, but vernacular speech hardly occurs before the 1970s. Films made between the 1890s and the 1930s are silent. In the 1940s the small number of films with sound, presenting reports on events or topics in Glasgow or in the Central Belt, have a musical soundtrack and an RP-speaking commentator. For an example, see film number 0268, made by the Glasgow Corporation Housing Department: ‘Progress Report: A survey of Municipal Housing Activity in Glasgow. New council housing at Knightswood, Cranhill, Pollock and Tollcross’: <http://ssa.nls.uk/film/0268>. Films from the 1950s and 1960s are very similar, only there are now a very few which have Scottish Standard English commentators, whose accents are accommodating strongly to RP (see Johnston’s comments on SSE e.g. Johnston 1997, Johnston 1985). The situation is similar for the British Library’s Sound Archive, which has a handful of rural Scottish dialect recordings and songs for this period, with the important exception of the Berliner Lautarchiv corpus, from which the sample discussed here is drawn.

2.1 The Berliner Lautarchiv British & Commonwealth Recordings

In 2008 the British Library acquired 66 dialect recordings, digitized versions of 821 shellac discs, from a much larger sound archive held by the Humboldt University in Berlin, which had been compiled between 1915 and 1938 by the German language teacher and sound pioneer, Wilhelm Doegen (for more information about Doegen, see e.g. [The Doegen Records Web Project](#)). The recordings which are analysed here are from a series of visits made by Doegen and a Professor of English, Alois Brandl, to Prisoner of War camps in various parts of Germany between 1916 and 1917, in order to make recordings of soldiers’ languages and dialects, in the form of recitations and songs. A selection of the recordings, including all those discussed here, are openly available on the British Library’s website: <http://sounds.bl.uk/Accents-and-dialects/Berliner-Lautarchiv-British-and-Commonwealth-recordings>

2.2 Speaker sample for early Central Belt Scottish English (1916-17)

The Scottish recordings comprise 17 speakers, nine from northern and southern Scotland (Caithness, Aberdeen, Fife, Perth and Kinross; Ayrshire, Berwickshire),

and the eight men considered here from Glasgow and the Central Belt; there is no recording from Edinburgh. The details of our speaker sample are given in Tables 1 and 2; Figure 1 shows the location of their place of birth/residence before the war.

<i>Speaker</i>	<i>Provenance</i>	<i>Date of Birth</i>	<i>Date of recording</i>	<i>Age</i>	<i>BL shelfmark</i>
William Bryce (1)	Glasgow	1891	21/07/1916	25	C1315/1/444
John Johnstone (2)	Maryhill	1896	15/06/1917	21	C1315/1/639
William Cooper (3)	Kirkintilloch	1889	10/05/1916	27	C1315/1/401
James Crawford (4)	Blantyre	1884	26/09/1917	33	C1315/1/700-701
William Lothian (5)	Hamilton	1887	10/05/1916	29	C1315/1/398
Hugh Fulton (6)	Newarthill	1883	03/07/1917	34	C1315/1/671
Thomas Sneddon (7)	Falkirk	1896	03/07/1917	21	C1315/1/651-2
Thomas Finnie (8)	Bathgate	1887	14/06/1917	30	C1315/1/634-6

Table 1 Provenance, age and details of the recordings for the eight Central Belt Scottish English men, whose speech was recorded in 1916 and 1917.

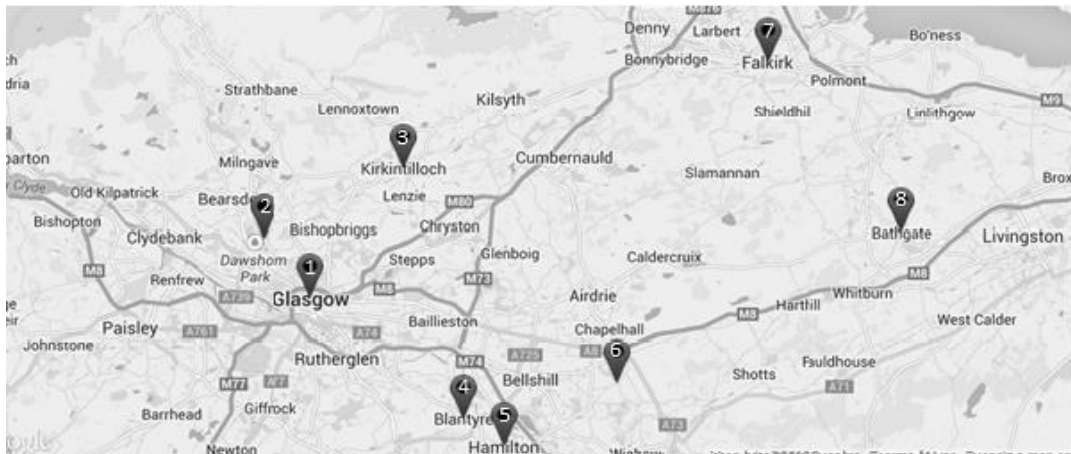


Figure 1 Map of the Central Belt of Scotland showing the provenance of the 8 speakers from the Berliner Lautarchiv corpus. Speakers can be identified by their numbers, which are also given in Tables 1 and 2.

<i>Speaker</i>	<i>Education</i>	<i>Stated occupation</i>	<i>Mother tongue</i>	<i>Father</i>	<i>Mother</i>
William Bryce (1)	public school	Soldier	"Scottish"	Glasgow	Glasgow
John Johnstone (2)	boarding school	Accountant	"English"	Dumfries	Stirlingshire
William Cooper (3)	elementary school	Tailor	"Scots"	not known	not known
James Crawford (4)	public school	Salesman	"Scottish"	Dundoland	Glasgow
William Lothian (5)	elementary school	Soldier	"Scottish"	Fife	Lanarkshire
Hugh Fulton (6)	public school	Vanman	"Scottish"	Newarthill	Newarthill
Thomas Sneddon (7)	public school	Farmer	"Scottish"	Falkirk	Falkirk
Thomas Finnie (8)	elementary school	Shoemaker	"Scots"	Bathgate	Slamanan

Table 2 Education, occupation, stated dialect, and provenance of parents, for the overall sample of eight Central Belt Scottish men, from whom recordings were made in 1916 and 1917.

The sample consists of eight men, six from the western Central Belt and two from the east, Thomas Sneddon and Thomas Finnie from Falkirk and Bathgate respectively. Two are from Glasgow, William Bryce from the city of Glasgow, who indeed sounds ‘Glaswegian’, and John Johnstone from Maryhill to the northwest of the city centre. All of the recordings can be accessed via the British Library website, by searching for the British Library (BL) shelfmark given in Table 1, at the Advanced Search page of the Sound Archive.

A few personal notes were collected from each speaker, and can be seen beneath the recording on the British Library webpage. All of the men were in their twenties and thirties at the time of the recordings (average age is 29). All state that they are of Protestant religion, and have had at least elementary education (until the age of 10 or 11); they can all read and write (in ‘English’). Interestingly, all bar John Johnstone refer to their spoken language as ‘Scottish’ or ‘Scots’, but to their written language as ‘English’; Bryce and Cooper even say that English was their ‘additional language’. In terms of social background, Johnstone seems to be aspiring middle-class. He reports that he was educated at a boarding school in Glasgow, and describes himself as an accountant, having been previously a clerk in a railway company. We include him in our sample because his recording is clearly in Scots.

2.3 The text: reading/reciting a biblical passage

Various short recordings were made from each speaker, such as counting in Scots, singing songs, and reading a short passage. Here we present analyses of the men reading the passage, the Parable of the Prodigal Son (Luke chapter XV, verses 11-32). These recordings are presented as reading a text. The few photographs of the recordings in progress, as shown in Figure 2, suggest that speakers may have had a text in front of them as they spoke (Doegen is holding the text above the recording horn for the speaker). They also had a rather diverse audience.



Figure 2: Wilhelm Doegen (right) recording a speaker in the Prisoner of War camp in Wahn (near Cologne) in October 1916, with the assistance of Alois Brandl (left of speaker). The picture was sent by Doegen to Brandl in 1925 with an inscription recalling their recordings together (Wissenschaftliche Sammlungen an der Humboldt-Universität, Berlin: <http://www.sammlungen.hu-berlin.de/dokumente/8247/>).

However, it is clear from the actual recordings that speakers were as much reciting or recalling biblical recitation from memory as they were reading, because each of the recordings discussed here is slightly different in terms of lexis and phrasing. For example, in our eight speakers' recordings, the 'fatted calf' that is killed for the feast for the prodigal son appears as: the 'fatted calf' [kaf] (Maryhill, Blantyre), the 'fatted cauf' [kɔf] (Hamilton, Newarthill, Bathgate, Falkirk), the 'muckle fat cauf' [kɔf] (Kirkintilloch), and the 'fatted coo' [kɔ] (Glasgow). That the men might have been able to recite the passage from memory is also likely given that all state that they are 'of Protestant religion', which in Scotland constitutes different versions of reformed Protestantism, all of which are strongly centred on biblical teaching. Their likely attendance at church Sunday School, as well as daily school, would have required rote learning of key bible passages, such as this one. Certainly all produce it fairly fluently, and with the intonation and rhythm of a recitation.

An example of the text, as recorded by Bryce from Glasgow, is given in the Appendix. The first impression of this and the other recitations, by contrast with contemporary Glaswegian (and Central Urban Scots) is the density of Scots lexis, which is reminiscent of the 'broad' Scots from Aitken's model of Scottish speech (Corbett and Stuart-Smith 2012). Doegen was keen to document dialects. There is a possibility that even these speakers, who seem to have been largely vernacular speakers, also enhanced their use of Scots forms for the recitation. Reading here was not intended to elicit more formal or standard speech.

To sum up, it is clear that these recordings represent a particular style of speech which is certainly recitation, but may also include reading, for Doegen and his assistants (and possibly the others present), with likely emphasis on the production of dialect forms. As a result our inferences about the state of early Scottish English are made with caution, as are our comparisons with findings from later recordings.

3 Method

3.1 Preparation of the sound files for analysis

We used the methods and resources of an ongoing project on real-time change in Glaswegian dialect, *Sounds of the City* (<http://soundsofthecity.arts.gla.ac.uk/>) to facilitate the analysis of the Berliner Lautarchiv recordings. This project uses electronic corpus software, LABB-CAT (Fromont and Hay 2012; <http://labbcats.sourceforge.net/>), developed for the Origins of New Zealand English project, to store, manage, search, and partly analyse our data. The eight sound files were orthographically transcribed using Praat (Boersma and Weenink 2013), with reference to a transcription protocol for vernacular Scottish English, which had already been devised for the existing project. In Praat, time-aligned orthographic transcriptions were made for each recording, breaking the speech down into shorter utterances, usually intonational phrases which tended to align with major or minor syntactic boundaries.

Transcripts and wav files were then uploaded to LABB-CAT, which allowed us to access and browse the time-aligned text/sound files, and at the same time, generate an automatic phonemic transcription. After correction and addition of any new lexical items to the LABB-CAT dictionary, the recordings were then force aligned using the HTK routine in LABB-CAT, resulting in an initial automatic segmentation of the waveform against the phonemic transcription for all the recordings. This gave us a set of text/sound files which could be electronically searched using orthographic or phonemic search strings, against other parameters such as lexical stress (generated by LABB-CAT's link with the CELEX databases).

Given that the materials used are digitised versions of audio recordings made around a hundred years ago on shellac discs, the general quality of the recordings is poor, and some recordings had poorer sound quality than others, e.g. the Hamilton and Newarthill recordings are particularly muffled. In order to remove high-frequency hiss, recordings were lowpass filtered removing acoustic energy above 7KHz; thereafter noise-cancelling was carried out using Audacity (Audacity Project 2005). The filtered and noise-cancelled sound files were used for auditory transcription. The particular features reported here were at least partly determined by the difficulties imposed by the quality of the recordings. For example, fricatives were hard to hear and patterns of fricative energy can also be difficult to discern spectrally.

3.2 Auditory phonetic analysis

T-glottalling The realization of /t/ in sites where T-glottalling (Wells 1982) is found in contemporary Scottish vernacular was transcribed by JSS, a native speaker of near-RP. All possible instances of /t/ were coded in the following contexts (see e.g. Stuart-Smith et al 2007): (1) occurring in intervocalic position (e.g. *fatted*), (2) in word-final position before a word beginning with a vowel (e.g. *let us*), and (3) in word-final position which was also phrase-final position (e.g. *feet#*). A range of auditory variants were identified and categorized broadly as [t], which included released and apparently unreleased denti-alveolar voiceless stops as well as a few apparently voiced plosives (in e.g. *pity*, *but as* for some speakers), and [ʔ], what sounded like glottal stops, but includes apparently completely deleted stops (especially in word-final/phrase-final position), also stops with nasal release, e.g. in *hadn't*. A total of 202 stops, on average 25 per speaker, were transcribed to assess T-glottalling. Transcription was carried out from the waveform using the Praat TextEditor view; the poor sound quality meant that auditory impressions were also supplemented by inspection of the spectrogram in order to assess acoustic characteristics such as reduction in amplitude reflecting stop closure, or slowing or irregularity in periodicity reflecting creaky voicing for a glottal stop.

Rhotics Auditory analysis of all rhotics was carried out by EL, a native speaker of Central Belt Scottish Standard English. Auditory coding of tokens of Scottish /r/ can be difficult enough, even with good audio quality, see Stuart-Smith 2007. In order to improve the reliability of auditory coding, two stages of auditory coding were undertaken using Praat: (1) a transcription tier annotation, (2) a randomised re-listening to, and recoding of, each /r/ token, using the Praat Multiple Forced Choice interface, followed by a comparison of the results of these two coding phases.

/r/ was transcribed as one of five variants: a trill, tap, approximant, derhoticised /r/, zero /r/, or was labelled as unclear/uncategorisable. Given the quality of the recordings, more subtle categorisation of /r/, e.g. identification of devoicing or retroflexion was not possible. Phonotactic context was also transcribed using conventional notation, including syllable position, whether /r/ was preceded or followed by a vowel or a consonant, whether word-final /r/ was immediately followed by a syllable, word or phrase boundary and whether onset or coda /r/ occurred in a stressed or unstressed syllable.

708 tokens of onset, intervocalic and coda /r/ were identified overall (around 90 for each of the 8 speakers). Due to the fact that the audio quality of the recordings was poor, each token of /r/ plus some context (words immediately flanking) was extracted for randomised relistening and recategorisation. Using the Praat Multiple Forced Choice interface, the sound files were listened to again in random order and the /r/ classified by EL into one of the five variants listed above – multiple replays were allowed.

53% of the tokens of /r/ were classified as belonging to the same variant category during initial transcription and randomised replay, 5% were within one category of one another, e.g. categorised as *derhoticised* and *no /r/*, or *tap* and

*trill*¹. 21% were classified as variants more than one category apart, most commonly *approximant* and *derhoticised*, or *tap* and *derhoticised*. The remaining 20% were not classified in one or both of the classification scenarios. Agreement of less than 58% by the same auditory coder along with 20% of tokens unclassifiable in one or other classification scenario is, in part, a reflection of the poor audio quality of the recordings. The low agreement rate also reflects the complexity of coding /r/ auditorily in connected speech, where /r/'s quality is affected by preceding and following segments. Finally, this low rate of agreement also reflects the difficulty of categorisation of /r/ variants in a variety of English where /r/ is weakening in postvocalic position and auditory cues have become ambiguous, see Stuart-Smith (2007).

During annotation, the spectrogram was also inspected to improve accuracy of identification of rhotic variants used. The spectral characteristic most frequently associated with rhoticity, lowering of the third formant, could not always be observed, due to a combination of the lower acoustic intensity of F3 during production of a rhotic and masking noise in the acoustic signal. Some spectral cues for rhoticity were observable, however; the auditory impression of a tapped /r/ often coincided with a brief, but substantial, lowering of the energy in the first and second formants on the spectrogram, i.e. corresponding to the constriction phase of the tap, see Figure 3.

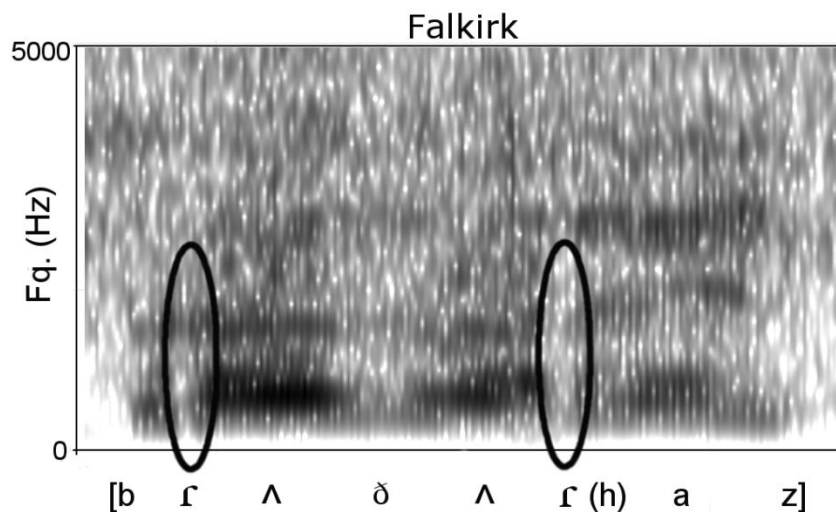


Figure 3 Thomas Sneddon from Falkirk saying “brother has”. Black ellipses show momentary interruptions of the acoustic signal, corresponding to the tapped /r/ variants at the beginning and end of “brother”.

Likewise, trilled /r/ often corresponded to multiple brief interruptions in F1 and F2 in the acoustic signal (see Figure 4).

¹ It could be argued that categories such as *approximant* and *derhoticised* or *tap* and *derhoticised* are one category apart also – these differences made up the majority of the remaining tokens where there was no agreement between the two stages of classification.

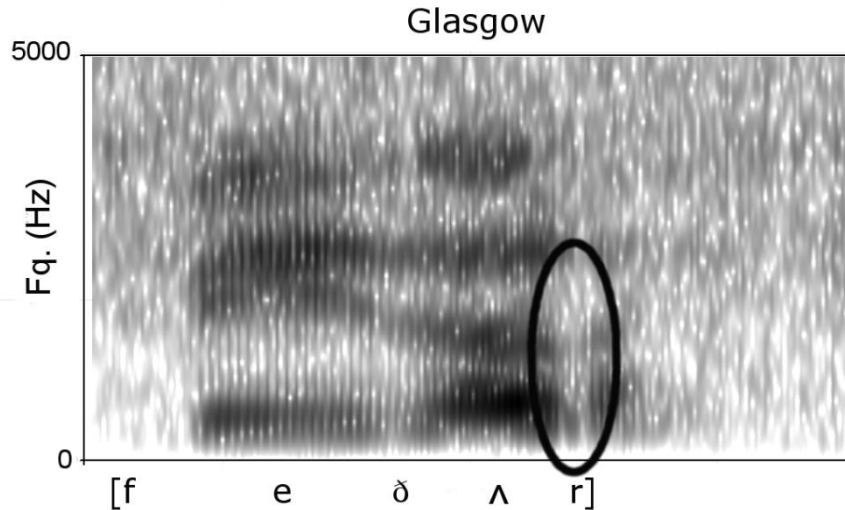


Figure 4 William Bryce from Glasgow saying prepausal “faither”. Black ellipse shows two momentary interruptions in the acoustic signal, corresponding to a trilled /r/.

Conversely, a lack of these features in the acoustic signal could often be used to verify the auditory impression of a non-tapped/non-trilled approximant variant. Where a derhotic variant was identified, it often corresponded with straight F1 and F2 or a rising F2 trajectory.

4 A sketch of early Central Belt Scottish English

4.1 General impressions

Prosody The recordings are strongly affected by the style of the speech elicitation, namely the recitation or reading of a passage. Interestingly, whilst Central Belt Scottish English shows a classic isogloss in the direction of terminal pitch patterns, which fall in the east and rise in the west (e.g. Macafee 1983: 36-37; Cruttenden 1997), in these recordings, the ends of sentences, and many clauses, show falling intonation, for all speakers, irrespective of their provenance. Cruttenden (2007) found that the Glaswegian speaker in his study also had final rises in conversation and falls when reading a text. Both Grant’s contemporary (1912) and McAllister’s later (1938) elocutionary texts for Scottish and especially western Central Belt Scottish speakers, urge speakers to use Anglo-English falling pitch for declarative statements. The need for explicit models, practice routines, and both commentators’ brief and disparaging comments about local intonation indicate that Central Belt Scottish English in the first half of the 20th century typically showed final rises. The predominant use of falling terminals by all the western Central Belt men indicates that they may have used the visual text prompt which we can see in the photograph in Figure 2, even though they ended up selecting slightly different words. It also points to the presence of distinctly different intonational models for literacy and spoken language, the former probably continuing that of (Southern) Anglo-English through the emerging Scottish Standard which was well established in education (e.g. Corbett et al 2003; Cruttenden 2007).

Vowels Broad phonetic auditory transcription of the stressed monophthongs of the Berliner Lautarchiv recordings confirmed the presence of the following vowels: /i ɪ e ε a ʌ ɔ o ʊ/, with the expected distribution for Scottish English. So one vowel is found where Anglo-English has two for TRAP/BATH, FOOT/GOOSE, and COT/CAUGHT; Wells 1982; Abercrombie 1979), but vowels are selected differently for systematic Scots/SSE lexical alternations (e.g. *aff/off* /a ɔ/, *heid/head* /i ε/, *oot/out* /ʊ ʌʊ/, e.g. Macafee 1994). The main findings of the acoustic analysis of the three-speaker subsample are reported in Stuart-Smith et al (forthcoming), and align with those of contemporary reports from e.g. Grant (1912). /ɪ/ is retracted and lowered, /e/ is raised, /a/ is retracted, /ʊ/ is central and close, and /o ɔ/ are merged. Again analysis of vowel duration confirms that the Scottish Vowel Length Rule operates only for /i ʊ/ and marginally for /ae/, which shows clear differences in vowel quality (Stuart-Smith et al forthcoming).

4.2 T-glottalling

T-glottalling has a particularly long history in western Central Scotland. Perhaps the earliest account of the glottal stop in the U.K. comes from Alexander Melville Bell, who noted:

“The Breath Obstructive Articulations, especially the letter T, are, in the West of Scotland pronounced without any articulative action, but with a mere glottal catch, accompanying the articulative position.” Melville Bell (1860: §137).

The use of the glottal stop for /t/ is well documented for urban Scots from the first sociolinguistic surveys (e.g. Macaulay 1977), but it probably became established as a stereotype of Glaswegian vernacular well before the turn of the 20th century. This is clear both from Bell’s observation and also the elocution manuals which observe and advise against the ‘degenerate glottal stop’ typical of the Central Belt (McAllister 1938: 71; see also Grant 1912: 30), and from contemporary observations collated by Macafee (1994: 27, n. 20), such as the quotation from one George MacDonald’s letter of 1892: ‘Strangers hurl at us as a sort of Shibboleth such sentences as ‘Pass the wa’er bo’le, Mr Pa’erson!’’. The results of our auditory analysis of possible sites for T-glottalling in the Berliner Lautarchiv speakers also reveal glottal stops for /t/.

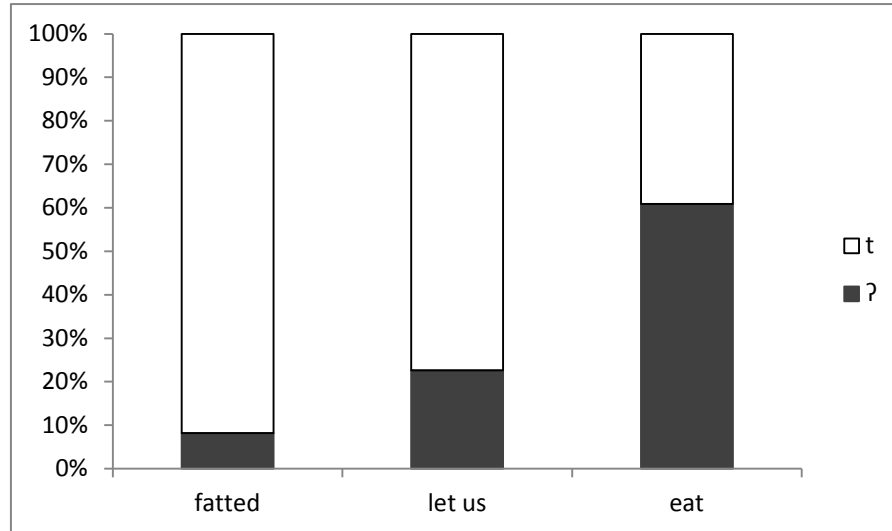


Figure 5: Distribution of glottal stops for /t/ in the full sample of the Berliner Lautarchiv speakers according to position: intervocalic e.g. *fatted*, word-final prevocalic, e.g. *let us*, and word-final prepausal, e.g. *eat*; N = 202.

We can see from Figure 5 that glottal stops constitute around a third of the variants for /t/ even in these recitations. T-glottalling also shows clear differences in patterning according to the position of /t/ ($\chi^2 = 42.49$, $df = 2$, $p < 0.001$), which are also rather similar to studies of T-glottalling from speech recorded in the second half of the 20th century (e.g. Macaulay 1977; Stuart-Smith 1999). Glottal stops are least likely to occur between vowels, confirming this as the most stigmatized position, and in fact they mainly occur in the Glasgow speaker, in the word *fatted*. The use of glottal stops by this speaker seems to be part of a general style shift towards the vernacular which he moves into about halfway through the recording, perhaps because he could no longer sustain the more monitored recitation style.

4.3. Rhotics

/r/ in present-day vernacular Scottish English Scottish Central Belt /r/ allophony is complex, more so in the vernacular than in Scottish Standard English, with much of this /r/ variation phonotactically conditioned. Some variation has been found to correlate with social factors such as socio-economic class and gender (Stuart-Smith 2007; Lawson et al 2014).

Of particular interest is the weakening of /r/ in coda position in vernacular Scottish English where the presence of /r/ is indicated more by qualitative changes to the preceding vowel (retraction, lowering, velarisation or pharyngealisation) than by the presence of a rhotic segment itself (e.g. Romaine 1978; Johnston 1997; Stuart-Smith 2007; Lawson et al 2014). Sociolinguistic researchers began to take serious notice of derhoticisation of /r/ in vernacular Scottish English from the late 1970s onwards; however, its appearance in the western Central Belt seems to have been much earlier and can be dated to at least 1901 from a comment by R. Trotter about ‘Glasgow-Irish’ in the Gallovidian magazine (Johnston 1997: 511). The

phonetic characteristics of derhoticisation, in particular pharyngealization of the preceding vowel, suggest that this process does not result from straightforward adoption of Anglo-English nonrhoticity (see e.g. Speitel and Johnston 1983: 28; Johnston 1997: 511). While vernacular Scottish English has seen /r/ weaken, approximant /r/ has become increasingly common in middle-class speech, replacing traditional tapped and trilled variants. Grant (1912: 35) states:

“Within recent years there has been a tendency to attenuate the force of the trill especially in final positions and before another consonant. This tendency is probably due more to imitation of Southern speakers than to a natural development in the pronunciation. The trill may be reduced (finally and before consonants) to a single tap [ɾ], or even to a fricative consonant [ɹ],”

Johnston (1985) suggests that [ɹ] in middle-class Scottish English was most likely adopted from eighteenth-century precursor to RP.

On a scale of strong (more consonantal) to weak (more vocalic) rhoticity, the transition from tap/trilled /r/ to approximant /r/ in Scottish English therefore does not represent a natural process of lenition, but rather signifies the convergence of two phonetic/phonological systems, those of Scots and Scottish Standard English. The variants do not fit easily into a rhotic continuum, as Romaine (1978: 147) notes in her study of Edinburgh schoolchildren’s use of /r/, ‘there is nothing ‘in-between’ a [ɾ] and [ɹ]’.

The Lautarchiv recordings allow us to assess to what extent approximant /r/ was prevalent in male working-class speech during the early twentieth century as well as to compare rates of weak rhoticity in this early twentieth century corpus with later twentieth and early twenty-first century corpora.

/r/ in the Berliner Lautarchiv sample The results of the auditory analysis of all possible instances of /r/ in the Berliner Lautarchiv recordings are given in Table 3, showing the distribution of variants according to syllable position.

Phonotactic position	Mean % of variant used				
	Trill	Tap	approximant	Derhotic	No /r/
Onset /r/	7	52	42	0	0
Coda /r/	4	29	35	27	5

Table 3 Mean percentage of variants used in syllable-onset and coda position (onset n = 139; coda n = 502)

Weak /r/ variants (derhoticised /r/ and /r/ deletion), as we would expect, are confined to syllable-coda position. Tapped /r/ and approximant /r/ variants dominate in onset position with a small proportion of trilled /r/ also used. The Falkirk and Glasgow speakers produced higher quantities of trilled onset /r/ than other speakers in the study, respectively 25% and 17% of their onset /r/s were trilled. Trilled /r/ is used more frequently for singleton word-initial /r/ e.g. *ring*, *rose*, *ran* (37% of singleton word-initial /r/ tokens were trills) than in other

phonotactic contexts. It is possible that use of trills in this phonotactic context are a demonstration of Scots pronunciation, given the performative aspect of reciting aloud the biblical passage. We see low levels of trilling in other onset contexts #Crv (*angry, country* /kʌn.tre/), CrV (*brother, great, bring*), C#rv (*country* /kʌnt.re/, *everything*), v#CrV (*begrudged*), v#rV (*arose*) and no instances of trilling intervocalically Vrv (*merry, very, forrit, parable*).

The highest rates of approximants occurred in the v#CrV (e.g. *begrudged*) (67%) and CrV (*great, brother, bring*) (52%) contexts. Tapped /r/, however, occurs at high levels in all onset contexts, including labial and velar clusters, and is particularly common after a vowel, e.g. v#rV (*arose*) (80%) and intervocalically (*merry, very*) (79%).

In coda position, approximants, taps and derhotic variants dominated, with a small percentage of the strongest (trills) and weakest (/r/ deletion) variants. Again, around 20% of the Falkirk informant's coda /r/s were trills, but this was exceptional in the speaker group.

When we considered onset and coda /r/ variants by geographical location, we found no clear east-west divide concerning either the use of the non-local approximant /r/, or the use of vernacular derhoticised variants (see Figure 6). Surprisingly high levels of weak /r/ variants (derhoticised /r/ and /r/ deletion) were found in the Lautarchiv data, even at this early date. The speaker from Falkirk stands out from others in this small corpus due to his frequent use of trilled /r/, not only in onset position, but also in coda. This speaker also produced the smallest percentage of weak /r/ variants (derhoticised /r/ and /r/ deletion) in coda position. The speaker who used the greatest quantity of weak /r/ variants was from Blantyre.

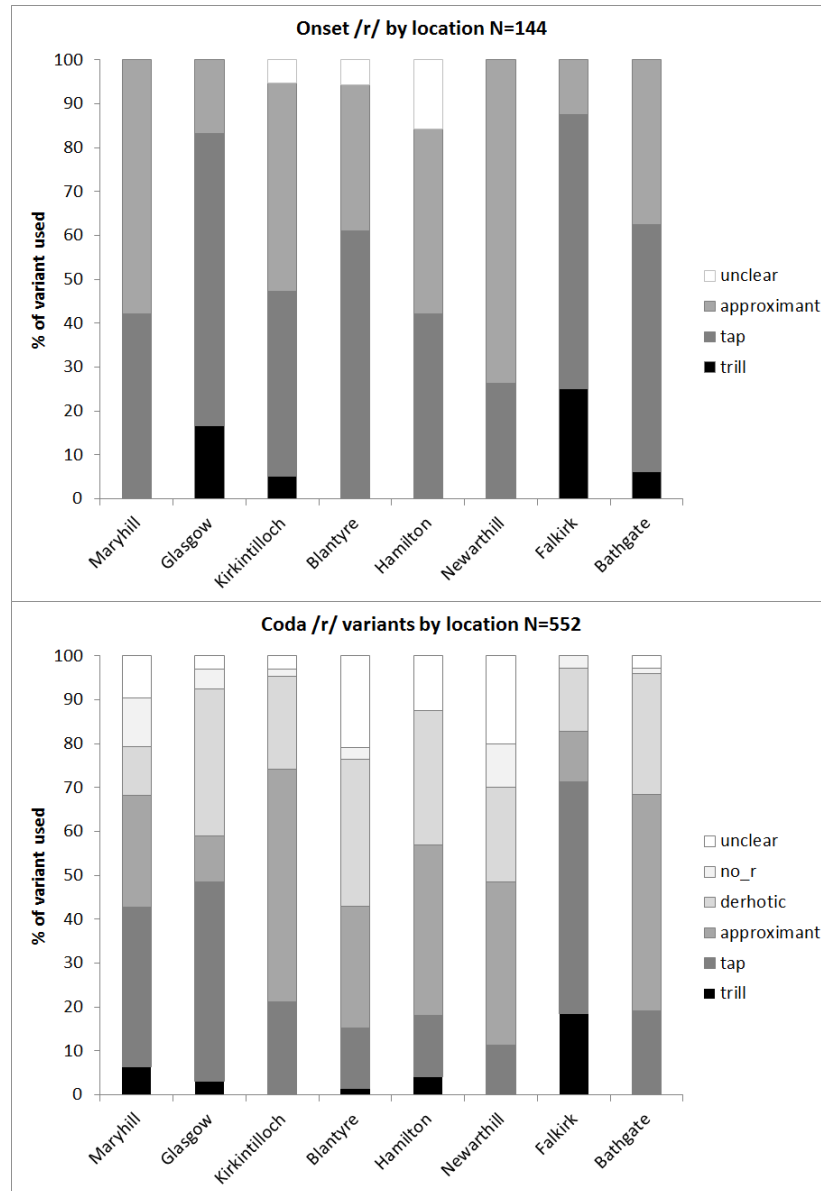


Figure 6 Percentage breakdown of onset /r/ variants used by the Berliner Lautarchiv sample, from 8 different locations in the Scottish Central Belt, in (a) upper, onset position (n = 144) and (b) lower, coda position (n = 552).

A comparison of the Maryhill and Glasgow speakers gives us some insight into /r/ variation conditioned by social-class during the early twentieth century (see Figure 7). The Maryhill speaker reports that he was an accountant, while the Glasgow speaker was identified as having ‘been in the army since the age of 18’. We are able to see emerging patterns of use that would become well-established as the twentieth century progressed. The Maryhill speaker was found to use fewer tapped and trilled /r/s than the working-class Glasgow speaker. On the other hand, the rate of approximant /r/ use in onset position was much higher in the speech of the Maryhill speaker than for the Glasgow speaker. These results confirm observations made from the early elocutionary books and Scottish phonetic handbooks, e.g. Walker

(1791); Grant (1912: 35ff.); McAllister (1938: 179), as well as much later studies of Central Belt /r/ (e.g. Lawson et al. 2008), that middle-class speakers are more likely to use approximant variants than working-class speakers, who use more traditional tapped and trilled variants of /r/.

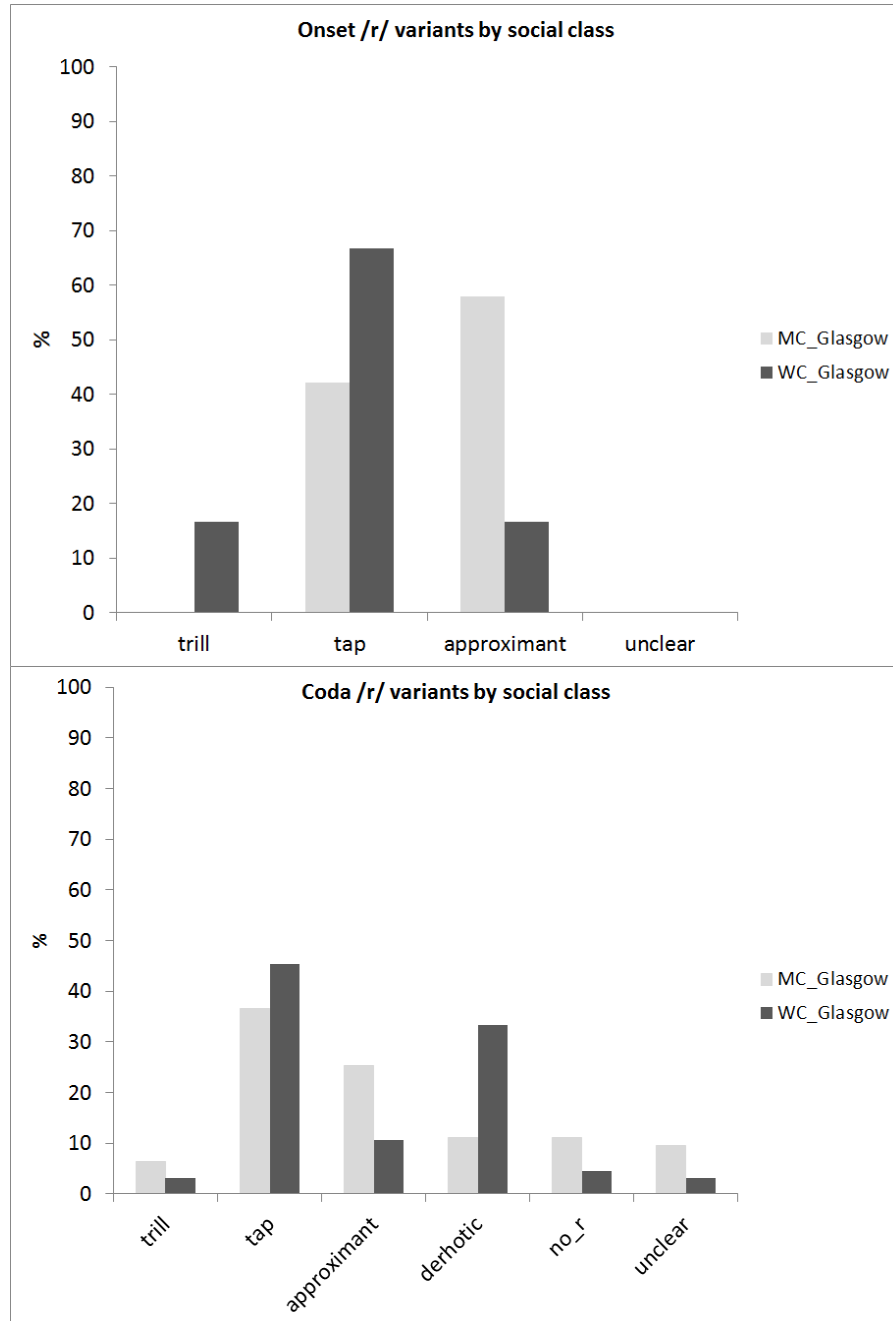


Figure 7 Variants of /r/ by social class, comparing one Glasgow middle-class speaker (Maryhill: pale grey) with one Glasgow working-class speaker (Glasgow: dark grey), in (a) upper, onset position and (b) lower, coda position.

For coda /r/, the working-class Glasgow speaker used slightly more tapped /r/ than the middle-class Maryhill speaker. The Maryhill speaker used more approximant /r/ than the Glasgow speaker (+14%) and the Glasgow speaker uses much more derhoticised /r/ than the Maryhill speaker (+22%). The fact that the lowest percentage of derhoticised coda /r/ was produced by the middle-class Maryhill speaker seems to agree with the findings of later studies that suggested that derhoticisation is a change from below (Romaine 1979; Speitel and Johnston 1983).

Weakening of /r/ in postvocalic position in English (both in present-day Scotland and historically in English, Hickey 2014) has previously been found to be associated with specific phonotactic positions, specifically unstressed syllables (Dobson 1957: §427), preconsonantal position (Walker 1791: 50) and also utterance-final position (Romaine 1978; Lawson et al 2008). Table 4 shows the percentage of tokens realised as weak variants of /r/ in the seven most common phonotactic environments where /r/ weakening occurs in the Berliner Lautarchiv recordings.

Phonotactic context	% of variants in this context that were realised as derhoticised or /r/-less	Example of phonotactic context
vr###	88	<i>faither, brother, maister</i> in utterance-final position
VrC	59	<i>forth, years, start, served</i>
vrC	52	<i>gaithered, others, faithers</i>
Vr###	40	<i>share, more</i> in utterance-final position. N.B. only 10 tokens of /r/ in this context were identified in total.
vr##C	24	<i>after the; faither gied; never give</i>
Vr#C	16	<i>worthy, servant, working</i>
Vr##C	14	<i>mair than; start for</i>

Table 4 Seven phonotactic environments conditioning weak /r/ in the Berliner Lautarchiv full sample. v indicates an unstressed syllable, V indicates a stressed syllable, C indicates any consonant.

The results in Table 4 confirm utterance-final position, preconsonantal position and weak stress as key internal factors that condition weak rhoticity in these early Scottish English recordings. All of these environments have also been linked to /r/-loss either in present-day Scottish English or in Anglo English in the past. One potential explanation for /r/ weakening (and loss) in utterance-final position relates to changes in the timing of the /r/ gesture where utterance-final syllable lengthening occurs. It has been found that in this key phonotactic location, the tongue-tip raising gesture can often be delayed to the point that it occurs after voicing ends and so becomes inaudible or only weakly audible, see Lawson et al. (2014). A similar tendency has been found to occur for utterance-final /l/ (see Recasens and Farnetani 1994).

5 Coda /r/ across a century of Central Belt Scottish English

Carrying out a real-time comparison of opportunistic samples is always awkward because of gross differences in context and speech style. Here, the Lautarchiv recordings are essentially performed recitations, while the more recent sociolinguistic speech samples of Central Belt Scottish English comprise spontaneous speech of different kinds, and/or read wordlists. For example, Stuart-Smith's 1997 and 2003 datasets had speakers chatting to each other in same sex, self-selected pairs, as well as reading word lists (e.g. Stuart-Smith et al 2007; Stuart-Smith et al 2014). The datasets for Scobbie, and Lawson's 2007 West Lothian corpus, see Scobbie, Stuart-Smith and Lawson (2008), have similar materials from the east. However, Scobbie, Lawson and Stuart-Smith's 2007 eastern Central Belt and 2012 western Central Belt audio-ultrasound recordings are primarily in wordlist form (Lawson et al 2014). Comparison is inevitably tricky, so here we select two, which interestingly show slightly different views of stability and change in coda /r/ across the century.

Comparison 1: coda /r/ in the Berliner Lautarchiv and West Lothian 07 corpora. The first comparison is made with our West Lothian 2007 corpus (WL07), see Lawson et al 2008, which contains the same-gender dyad conversations of fourteen male High School pupils aged 12-13 from Livingston in West Lothian. Livingston is a New Town 13 miles west of Edinburgh and geographically closest to the location of the Bathgate (eastern) speaker. The school was selected because it served areas of multiple social deprivation in Livingston and therefore the young male pupils recorded can tentatively be identified as working class, like the majority of the males in the Lautarchiv study.

Some adaptation was required in order to match the /r/ variant classification categories from the Lautarchiv study to the WL07 study. While the WL07 analysis had auditory categories *alveolar approximant* and *retroflex approximant*, WL07 also had one category only to cover the categories *derhotic* and *no /r/*, as the rapidity of spontaneous conversation made it difficult to make the fine distinction between those two categories. For the purpose of comparing the two corpora, therefore, the variants considered were *trill*, *tap*, *approximant* and *derhotic/no /r/*. The differences between percentages of variants used by the Lautarchiv informants and the WL07 informants is shown in Figure 8.

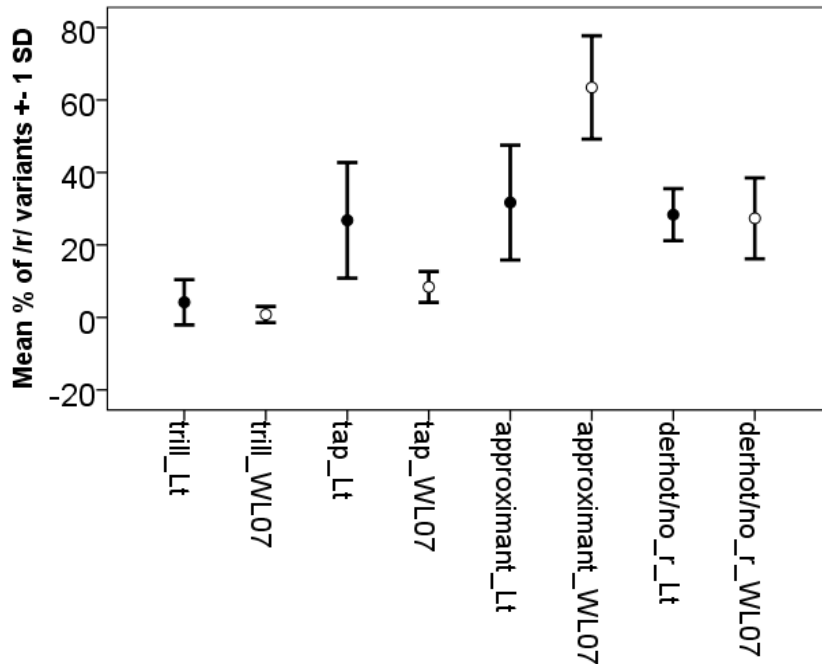


Figure 8 Error bars showing the mean percentage use of coda /r/ variants (± 1 standard deviation) used by all Lautarchiv informants (black circles, $n=552$) and the eastern Central Belt WL07 informants (white circles, $n=2566$).

While a small percentage of coda trilled /r/s were used by the Lautarchiv informants, only one out of the fourteen WL07 informants produced trills for coda /r/. Taps were reasonably common in coda position amongst the Lautarchiv informants (mean 25%, range 11-53%), but for the WL07 informants, coda tapping is rare (mean 6%, range 0-17%). Approximants, on the other hand, are much more common in the WL07 corpus (mean 68%, range 38-92%) than in the Lautarchiv corpus (mean 32%, range 11-53%). Perhaps the most interesting result, however – irrespective of speech style and age – is how little things have changed regarding *weak* variants of /r/ in the intervening one hundred years, the average percentages of weak variants in each corpus is almost the same; Lautarchiv mean 28%, range 17-38%, WL07 mean 26%, 7-39%.

This result suggests that this realization of postvocalic /r/ may have been stable over the century, and that derhoticisation is not advancing, or if it is advancing (in the west), this change is very gradual indeed. A couple of findings that would back up this notion are (1) Lawson et al's (2014) finding (based on word-list data), that showed almost all tokens of postvocalic /r/ rated as derhoticised or /r/-less contained covert tongue-tip raising gestures, i.e. /r/ was still present at the articulatory level; and (2) the finding that Glaswegian speakers can usually distinguish between rhotic and nonrhotic minimal pairs where derhoticisation has occurred, even where derhoticisation renders the minimal pairs auditorily very similar, e.g. *hut/hurt*, *bud/bird* (Lennon 2013). These two findings imply that an obvious mechanism for driving this change forward, misinterpretation or reinterpretation of an auditorily weak variant, may not be contributing to further

weakening or loss of coda /r/. Weak /r/ may, in fact, be a positionally-conditioned variant, occurring in specific predictable phonotactic positions.

Phonotactic context	% of variants in this context that were realised as derhoticised or /r/-less	Example of phonotactic context
vr###	46	<i>better, remember, another</i> in utterance-final position
Vr###	46	<i>car, here, there</i> in utterance-final position
vr##C	34	<i>another, answer, better</i> followed by a consonant
Vr##C	32	<i>pure, four, here</i> followed by another consonant
Vr#C	21	<i>morning, normal, recording</i>
VrC	18	<i>burp, first, heard</i>
vrC	15	<i>bothered, players, trainers</i>

Table 5 Seven phonotactic environments conditioning weak /r/ in the WL07 corpus. v indicates an unstressed syllable, V indicates a stressed syllable, C indicates any consonant.

Table 5 shows the percentage of tokens realised as weak forms of /r/ in the seven most common phonotactic environments where /r/ weakening occurs in the WL07 corpus. If we compare these environments with those shown in Table 4 for the Berliner Lautarchiv speakers above, we find that for both corpora, utterance-final unstressed position e.g. *father, better, brother, remember*, is the most common context for weak rhoticity. Further comparison shows similarity in the contexts where weak rhoticity is observed, but also differences in the ranking, which may relate to the more general differences in derhoticization observed in Eastern and Western varieties of Central Belt Scots.

Comparison 2: coda /r/ in the Berliner Lautarchiv and Glasgow 1997/2003 corpora. Our second comparison with a different dataset, this time from the western Central Belt and with real- and apparent-time dimensions, shows a slightly different pattern, and one which indicates that change may now be progressing, albeit gradually, and in conjunction with social identity. The data are from the two Glasgow corpora collected from working-class speakers from Maryhill, in 1997 and 2003, using read wordlists (Stuart-Smith et al 2014). Interestingly, this speech elicitation task did not provoke the automatic shift to the standard as expected in classic sociolinguistic methodology. In both corpora, the adolescent speakers treated this task as an opportunity for display and performance (see Stuart-Smith et al 2007). They rattle through the lists of words, sometimes laughing and commenting on them, and most interestingly for us, they show a strong shift towards non-standard variants (though not those blocked by orthography). This performative aspect of the wordlist readings make them in some ways rather

comparable to the performative aspects of the Lautarchiv recitations. This comparison shows that not only is weak /r/ a positionally-conditioned variant, it also has an additional element, age-grading in the form of the adolescent peak – heightened use of features undergoing change in adolescents’ speech (e.g. Tagliamonte and D’Arcy 2009).

The speaker groups for this comparison are the six Berliner Lautarchiv speakers from the western Central Belt, so excluding Bathgate and Falkirk (10X), and 90M: four men born in the 1940s and recorded in the 1990s; 00M: six men born in the 1950s and recorded in the 2000s; 90Y: four adolescent boys born in the 1980s and recorded in the 1990s; and 00Y: eighteen adolescent boys born in the 1990s and recorded in the 2000s.

Tokens which were coded as weak /r/, i.e. all variants of velarized/pharyngealized vowels, and all instances of vowels without audible secondary articulation – in the 1997/2003 data, so as derhotic (dark) or non-rhotic (pale) bars in the Lautarchiv data, are shown in Figure 9.

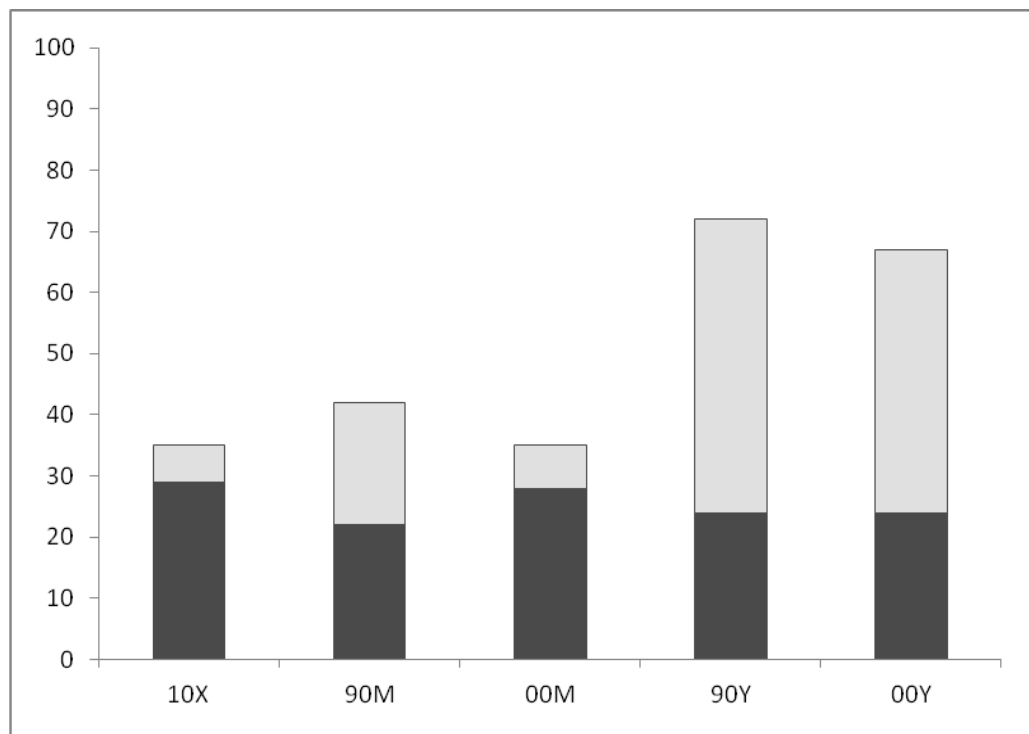


Figure 9 Percentage of weak rhotic variants of coda /r/ in the six western Central Belt Berliner Lautarchiv speakers (10X) and in the *Sounds of the City* corpus data for middle-aged men and adolescent boys recorded in the 1990s and 2000s (see text for labels). Derhotic variants are dark; non-rhotic/plain vowels are light; n = 4048.

This perspective on derhoticisation extends that of the comparison with the WL07 corpus. Here we see similar evidence of the stability in derhoticisation across the century, if we compare the Berliner Lautarchiv speakers with the middle-aged men. But if we look at the adolescents from the 1990s and the 2000s, we see much more

derhoticisation (cf. also Lawson et al 2014). This pattern could reflect a long period of stability in weak rhoticity (as suggested by Comparison 1), though lacking evidence for the intervening years, followed by a real-time increase in derhoticisation as indicated by the adolescent data. Or, the adolescent data reflect age-grading in the form of the adolescent peak. Our suspicion, following the careful analyses of Sankoff, e.g. (2006), is that we are probably witnessing both – a very long-term process of derhoticisation which may exist for long periods as positionally-conditioned stable variation, but which is also available to carry social-indexical meaning, and so to move into a socially-determined trajectory for change. The adolescent peak is witnessed when language changes are in progress; derhoticisation has carried covert social prestige of ‘street smarts’ since before the 1980s (Johnston 1997: 511). More recent evidence shows that derhoticisation is also promoted by indirect engagement with Anglo-English shown in television soap dramas (e.g. Stuart-Smith et al 2014). After a long period of near stability, derhoticisation may be taking off (again).

6 Concluding remarks

This chapter has presented an account of some aspects of what we believe to be the earliest extant recordings of vernacular speech of the Scottish Central Belt, from the Berliner Lautarchiv corpus. Much of what we find aligns well with contemporary observations often made perceptively, but inadvertently, by elocution and phonetic manuals. Qualitative and quantitative comparison of the features of the speech of these men with those of later recordings is subject to the constraints of differences in recording context, style and content. Nevertheless cautious comparison shows evidence for both stability and change in Scots vernacular across the 20th century, and not always as we might expect.

The pattern of T-glottalling according to context in the Lautarchiv speakers shows very similar constraints to those observed a hundred years later; the modest degree may likely be affected by the style of the recordings – this feature may have been fairly stable, and/or increasing only very gradually over the century. Our view of derhoticisation of coda /r/ has shifted from an emphasis on change, as in the early sociolinguistic studies, to one of a much longer-term change in progress, possibly exhibiting long periods of apparent stability, but also perhaps showing some signs of acceleration in conjunction with particular social-indexical meanings for derhotic variants, towards the end of the century. Clearly, the resolution of the window through which we view variation over time affects our inference of language change (Milroy 2003). At the same time, we note that our descriptions – and so our suggestions – are necessarily partial, requiring more evidence to help fill out the patterning for the missing decades across the century. It is clear that for us to gain a better appreciation of sound change in Scottish English vernacular, we must also continue to listen to – and document – the sound heritage that constitutes a key aspect of Scotland’s past.

Appendix

Sample Text ('The Story of the Prodigal Son', read by William Bryce from Glasgow)

There was a man whae had twa son. The youngest of them said to his faither, "Gie me that pairt of your guid's that belongs to me." So the faither gied him his share. No mony days efterwards, the young man gaithered aw his belongings together, and went away into a far country. There he wasted aw that he had. When he had spent awthing, a great famine kam ower the country, and he began to be in want. Before lang. So he had to tak ony work he could get intae, and was gled when he fund a place wi a man of that country. This man sent him intae the fields to look efter the pigs, he had to he had nae place to sleep in. He saw others at their meals but had naething hisselt to eat. Many a time he would have been gled to fill his belly with the husks that he had fed the pigs with, but even sic food his maister begrudged him. At last, when the young man kam to think ower what he had done, he said, "Ah!, how many paid servants of my faither have aw the food they want, and even mair than they want, and here am I dying of hunger. High time is it that I should gang back to my faither. This very day I will stert for hame, and I will gang to my faither and say to him, 'Faither, I have sinned against heaven and against thee. Ah'm nae langer worthy to be cawed your chiel. Mak me wan of your paid servants.'" And he arose, and kam to his faither. When he was yet a great way aff, his faither saw him, and had pity, and ran to meet him, and fell on his neck, and kissed him, and the young chiel said to his faither, "Faither, Ah've sinned against heaven and against you, and am nae langer worthy to be cawed your son." But the faither said to his servant, "Bring forth the best claes and pit them oan him, and put a ring on his haun, and shoes on his feet, and bring hither the fatted coo and kill it, and let us eat and be merry, for this ma son was deid and is aleeve again. He was loast and is found." Noo, his elder son was working in the fields, and he kam ower to the hoose. He heard music and dancing, so he cawed wan of the servants and asked him, "What do these things mean?" And the servant said to him, "Your brother has kam hame, and your faither has killed the fatted coo because he has got him back again, and soon." Then he was angry and wouldnae go in, so his faither kam oot, and asked him to come in, and he said to his faither. "These mony years have I served you, and ah've always done what you tellt me to dae, but you never gave me even a kid so that I might have a feast wi ma friends, but as soon as my brother kam, who has spent aw his money on wild leeving, you have the fatted coo killed for him." And the faither said to him, "Dear chiel, you are always with me and all that I hae is your, but this your brother was deid and is aleeve again, he was lost and is found."

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