Phonemic Variations in South Wales English Vowels

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1. Introduction

The vowels of Welsh accents of English have been reported descriptively in previous literature such as Parry (1977, 1979), Connolly (1981), Wells (1982), Coupland & Thomas (1990), Penhallurick (1991), Walters (1995–9), Mees & Collins (1999), Penhallurick (2007), Trudgill & Hannah (2008), Melchers & Shaw (2003), Mayr (2010), Hughes, Trudgill & Watt (2012) and Collins & Mees (2013). However, there are few acoustic investigations apart from Walters (1995–9) and Mayr (2010).

The aims of this study are to provide diagrams of F1–F2 plots in hertz of the vowels (F1–F2 vowel diagrams) of present–day South Wales English (hereafter SWE), and to discuss the influence of the Welsh language on the accents of SWE and the shifting/drifting of the vowels of the accents in progress.

The data for this paper were recorded in August and September 2014 in three areas in South Wales: Pontypridd, Cardiff and Pembroke. Pontypridd lies about ten kilometres north–northwest of Cardiff, the capital of Wales, and is located in the Rhondda Valleys where more Welsh was spoken at the time the older generations were born (Walters 2003a: 63). Cardiff developed as a port town for shipping coal and many workers migrated there from the English Midlands and the West Country in the nineteenth century. In Pembroke, English has been spoken “since well before 1800, in some cases possibly from the time of the Norman Conquest” (Mees & Collins 1999: 186) as the dialect norm in this area, which is called

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1 F1 means the first formant frequency and F2 the second formant frequency.
‘Little England beyond Wales’, the oldest written record of this term appearing in “William Camden’s Britannia in 1607” (Crystal & Crystal 2013: 123).

2. Methodology

2.1. The word list and carrier sentence

The collaborators were asked to read words aloud in a carrier sentence twice for each word. The second reading of each word was used for the acoustic analysis. The word list included 126 words which comprised 72 words from the ‘standard lexical sets’ (Wells 1982, Foulkes and Docherty 1999) and 54 words which were selected for the study of Welsh accents of English. These words were divided into eight groups and a pause was made after each group during the recording. The recorded files were also divided into groups.

The words were embedded in carrier sentence (1). The first four Pontypridd speakers, who were the first to be recorded, read the words in carrier sentence (2). The word then begins with a voiced dental fricative and the participants appeared to find it difficult to pronounce the resulting sequence of words. Sometimes they uttered sentence (2) in two intonation groups, and therefore the carrier sentence was changed from the fifth speaker.

(1) Say ________, please.

(2) I said ________ then.

2.2. Recording devices

A main portable recorder (3) with a plug-in microphone (4) and a backup portable recorder (5) were used for the recordings.
(3) Main recorder: Roland R−26
   Number of tracks: 2 (stereo)
   Sampling frequency: 44.1 kHz
   Quantisation: 16−bit
   Audio File Format: WAV

(4) Plug−in microphone: SONY ECM−MS957 (condenser microphone)
   Frequency response: 50−18,000 Hz

(5) Backup recorder: TASCAM DR−08 (TEAC)

The recorded material was analysed using Praat (Ver. 5.3). The formant frequencies were measured and the vowel diagrams were drawn using Microsoft Excel 2013.

2.3. The recording contributors

2.3.1. Pontypridd

Eight speakers (four male, four female) of the Pontypridd accent of SWE contributed to the recordings. They were elderly residents aged 66 to 90 years in Pontypridd (male speakers: 66, 67, 81 and 90, female: 68, 70, 72 and 86). All recordings were conducted in the homes of the respective participating informants on Friday, 29 August, 2014.

2.3.2. Cardiff

Eight speakers (four male, four female) of the Cardiff accent of SWE participated in the study. The first day recordings were made in the corner of the first floor of a pub, the Ivor Davies, in Canton, Cardiff, on Saturday, 30 August, 2014. The participants were a married couple: the husband was 55 of age and the wife 52. The place
was somewhat noisy but they were good subjects. The husband spoke in his broad Cardiff accent and the wife had been brought up in Welsh schools in Cardiff since her nursery school. She was a perfect bilingual speaker of English and Welsh.

On the next day, Sunday, 31 August, the recordings were conducted in a quiet room of Cardiff Bus Bowls Club. The participants were members of the club and retirees of Cardiff Bus company. The male contributors were 62, 64 and 68 years of age, and female contributors 63, 71 and 76.

2.3.3. Pembroke

Four speakers (two male, two female) of the Pembroke accent of SWE took part in the recordings on Monday, 1 September, 2014. Two male informants aged 65 and 70 were both typical South Pembrokeshire speakers and visitors to Pembroke Dock County Library. The recordings were made in a microfiche room of the library. Although appropriate female subjects were not found in the library, two female speakers collaborated with the study in Pembroke Power Station Sports and Social Club. However, one collaborator was young, 18 years, and the other was also not so old, 30 years of age. The empty lounge of the club was used for the recordings.

3. F1–F2 vowel diagrams

The F1 and F2 frequencies of the vowels of fifteen words (kit, dress, trap, lot, strut, foot, bath, cloth, nurse, fleece, palm, thought, goose, north and force) for monophthongs and six words (face, goat, price, choice, mouth and juice) for diphthongs were measured and the F1–F2 diagrams were drawn by area and gender. The female formant frequencies are higher than for males: about 50 (close vowels) to 200 (open vowels) Hz in F1 values and about 200 (open vowels) to 300 (close vowels) Hz in F2 values. On the basis of the diagrams the phonetic symbols (IPA) of vowels are represented
Figure 1 Pontypridd monophthongs: male

Figure 2 Pontypridd monophthongs: female
Figure 3 Cardiff monophthongs: male

Figure 4 Cardiff monophthongs: female
Figure 5 Pembroke monophthongs: male

Figure 6 Pembroke monophthongs: female
descriptively in the following tables, separately by monophthongs and diphthongs. In the tables the first symbols show the dominant vowels in the data and the symbols after a mid tilde mark (~) represent variants, which were pronounced by some informants. Length marks for long vowels are not used in the tables.

Figures 1 to 6 represent the F1–F2 vowel diagrams for monophthongs of the three accents by gender. Table 1 shows the summary of monophthongs as a result of an acoustic approach. Figures 7 to 12 give the vowel diagrams for diphthongs. The arrows in the figures indicate the formant transitions of diphthongs from the first element to the second element. The marks without arrows mean that the speakers pronounced the vowel as a monophthong. Table 2 demonstrates the summary descriptions of diphthongs by phonetic sym-

<table>
<thead>
<tr>
<th>Table 1 Monophthongs — summary</th>
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<tbody>
<tr>
<td><strong>Pontypridd</strong></td>
</tr>
<tr>
<td>KIT</td>
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<tr>
<td>DRESS</td>
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<tr>
<td>TRAP</td>
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<td>LOT</td>
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<td>STRUT</td>
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<td>FOOT</td>
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<td>BATH</td>
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<td>GOOSE</td>
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<td>NORTH</td>
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<td>FORCE</td>
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</table>
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bols. Figures 13 to 16 demonstrate the distinctive diphthong /iu/ of Welsh accents of English. They display the formant values of the vowels of four further words in two minimal pairs (in some accents of Welsh English) from the recording data: blue & blew and through & threw. Of course, these pairs are homonyms in Standard Southern British English (SSBE) and are pronounced with a long monophthong /u:/ in this accent. However, in Welsh English a phonemic contrast is often presented in each pair: /u:/ vs. /iu/.

4. Discussion and results

4.1. Monophthongs

4.1.1. Pontypridd

The STRUT vowels are consistently central mid [a]. The GOOSE vowels are also consistently [u]. The FOOT vowels are dominantly [ɤ] which is opener than [o]. The NURSE vowels are mainly pronounced as close-mid [ø], but a male speaker pronounced open-mid [œ]. The TRAP, BATH and PALM vowels have variants, but the vowels of these three lexical sets are basically central open-mid [ɤ] in Pontypridd. Concerning the length of the vowels [ɤ], the TRAP vowels are short, the PALM vowels long, and most speakers pronounced long for the BATH vowels. There is a slight tendency of maintaining the NORTH-FORCE contrast in Pontypridd, although Mees and Collins (1999: 188) “conclude that if it formerly existed [in General South Wales English], it is now virtually extinct”. That might be because the informants were of the older generation.

4.1.2. Cardiff

The TRAP vowels of the Cardiff accent are short and more open than those of Pontypridd. A male informant who has a broad Cardiff accent pronounced long [ɛ:ə] for the PALM vowels. The NURSE
vowels are almost the same as Pontypridd: mainly [ø], but a single speaker used a raised [œː]. Slight GOOSE−fronting appears in the vowel diagrams. The NORTH−FORCE contrast is extinct in Cardiff, but the dominant pronunciation is a raised [ɔ].

4.1.3. Pembroke

The TRAP, BATH and PALM vowels cluster around the central open−mid area [ʌ]. In terms of the NURSE vowels, female speakers pronounced a more advanced [ʊ] than male speakers. The NORTH−FORCE contrast is also extinct in Pembroke, but the dominant pronunciation is different from Cardiff: [o].

The pronunciation of the youngest female informant is rather different from the others: the KIT vowels are more open [e], the FOOT vowel a central mid [ɔ], and moreover the GOOSE vowels are diphthongising [ʌʊ]. Although Wells (1982: 385) points out that “[t]he GOOSE words spelt with o, oo, or ou have monophthongal [uː]−type pronunciations everywhere in Wales”, the two female contributors in Pembroke read the other words from the list, such as two, too, and even tooth², using the diphthong /ʌʊ/. This is their way of pronouncing the GOOSE vowels, although the speakers use the same diphthong for the NURSE vowels as discussed below.

² In SWE the short vowel /ʊ − ø/ is pronounced in the word tooth.
Figure 7 Pontypridd diphthongs: male

Figure 8 Pontypridd diphthongs: female
Figure 9 Cardiff diphthongs: male

Figure 10 Cardiff diphthongs: female
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Figure 11 Pembroke diphthongs: male

Figure 12 Pembroke diphthongs: female
4.2. Diphthongs

Table 2  Diphthongs — summary

<table>
<thead>
<tr>
<th></th>
<th>Pontypridd</th>
<th>Cardiff</th>
<th>Pembroke</th>
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<tbody>
<tr>
<td>FACE</td>
<td>ei ~ ei ~ e</td>
<td>ei ~ ei</td>
<td>ei</td>
</tr>
<tr>
<td>GOAT</td>
<td>ou ~ o ~ œu</td>
<td>ou ~ œu ~ œu</td>
<td>ou ~ ʌu ~ œu</td>
</tr>
<tr>
<td>PRICE</td>
<td>ʌi</td>
<td>ʌi</td>
<td>ʌi</td>
</tr>
<tr>
<td>CHOICE</td>
<td>ɔi ~ ɔi</td>
<td>ɔi ~ ɔi</td>
<td>ɔi ~ ʌi</td>
</tr>
<tr>
<td>MOUTH</td>
<td>ʌu ~ ʌu</td>
<td>ʌu ~ ʌu ~ œu</td>
<td>ʌu ~ œu</td>
</tr>
<tr>
<td>JUICE</td>
<td>iu ~ iu</td>
<td>iu ~ iu</td>
<td>iu ~ ʌu</td>
</tr>
</tbody>
</table>

As Wells (1982: 382) pointed out that “[i]n FACE and GOAT words, many Welsh people use long monophthongs .... In the more anglicized places such as Cardiff and Newport the norm is diphthongal”, among these three areas a monophthongal realisation appears only in Pontypridd. The usual vowels in Pontypridd are monophthongal: [eː] and [oː] respectively.

In the FACE vowels only a male eldest (90 years) participant in Pontypridd shows a monophthongal realisation. The vowels in Pontypridd are mostly [ei] with a narrow glide. The speakers were self-conscious when reading aloud and avoided the usual Pontypridd pronunciation [eː] of FACE. The diphthong is the more self-conscious pronunciation (p.c. from a phonetician from Pontypridd, Paul Carley). The FACE words are mainly pronounced [ei] in Cardiff and Pembroke. The GOAT vowels are chiefly [ou] in all three areas, but the variants are different. In Pembroke [ʌu ~ œu] arise for female speakers. In Pontypridd a monophthong [oː] was used by three contributors (2 male: 90 & 81 of age, 1 female: 70).

The PRICE words were read using the same vowel /ʌi/ by all participants from all three areas. Regarding the diphthongs, the three accents of SWE are basically consistent. The CHOICE vowels
are /ɔi/, and the MOUTH vowels /ʌu/. Some speakers used other variants. The MOUTH vowels in Pontypridd have narrow glides from mid to close−mid: [ʌu]. A female speaker in Cardiff and another female in Pembroke pronounced [æu] for the MOUTH vowels.

In the most anglicised spot, Pembroke, the glide of /ʌu/ in the JUICE vowels is narrow and a male speaker articulated a monophthong /u:/, that is to say, the GOOSE−JUICE split does not occur for the speaker. The first element of the diphthong /iu/ of the Pontypridd accent is closer than that of Cardiff: [iu].

In Figures 13 to 16, the scale is different from previous figures, and the close vowel domain is enlarged. Figures 13 and 14 shows instrumental measurements of the vowels of blue and blew, and each figure contains the vowels of all speakers from three areas by gender: Figure 13 for male, Figure 14 for female.

Interestingly, male speakers were clearly distinguished between the blue vowel and the blew vowel in Figure 13. Pontypridd speakers use the diphthong /iu/ for blew and the monophthong /u:/ for blue, that is, they are a minimal pair. All other male speakers from Cardiff and Pembroke pronounced [u:] for both words; they are homonyms. In the pronunciation by female participants Pontypridd speakers are perfectly classified as the same as male in Figure 14, but discrepancies arise for the other two accents. In Cardiff two subjects use [u:] for both words. An eldest (76 years) collaborator pronounced [iu] for blew and [u:] for blue. The remaining speaker, who was indeed bilingual in Welsh and English, said [iu] for both words. Perhaps her pronunciation was influenced from the Welsh language. However, she seems to use different vowel qualities for the two words. Figure 14 demonstrates that the vowel for blue is a narrow diphthong. Only the youngest participant in Pembroke used the diphthong for both words, and moreover, the qualities are almost the same.

Figures 15 and 16 represent the vowels of through and threw, and all the speakers applied /u:/ for through, and /iu/ for threw. All male speakers from Cardiff and Pembroke read both words with [u:]. Both female speakers from Pembroke used both words with [iu], and the vowels values are quite similar respectively in Figure
Figure 13  BLUE-BLEW vowels: male

Figure 14  BLUE-BLEW vowels: female
Figure 15 THROUGH–THREW vowels: male

Figure 16 THROUGH–THREW vowels: female
16. In Cardiff only the bilingual speaker used the diphthongs for both words, but the vowel qualities are contrasted. The glide of the through vowel is short, that is, a narrow diphthong as the same as the above the blue vowel. Incidentally she described her own accent of English as “Posh Cardiff” on the recording contributor’s pro-forma, which she was asked to fill in.

5. Concluding remarks

This study has described phonemic variations in SWE vowels in three areas in detail. Phonemic transcriptions based on positive evidence as well as auditory impressions by trained phoneticians seem to be of value as detailed records of the drifting phases of the regional accents. It is expected that more and more demonstrative researches on the accents of English will be conducted.

Acknowledgments

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cation.