The rise and rise of New Zealand English DRESS

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Abstract

This paper presents an analysis of DRESS and FLEECE in the speech of 80 New Zealanders. We show that DRESS is continuing to raise as part of the New Zealand English front vowels chain shift until it has almost completely overlapped the space occupied by FLEECE. In response, FLEECE is developing a more pronounced on-glide, so that a long vowel is becoming caught up in what has been a short vowel chain shift.

1. Background

The chain shift raising of the New Zealand English (NZE) short front vowels KIT, DRESS and TRAP is well documented, both auditorily (Bauer 1979, 1986; Bell, 1997) and acoustically (Maclagan, 1982, 2000a; Watson, Maclagan and Harrington, 2000). (We use Wells, 1982 KEY WORDS to indicate phonemes.) There has been debate as to whether the shift is a pull chain with KIT leading (Maclagan, 2000a) or a push chain with TRAP in the lead (Bauer, 1979, 1992; Trudgill, Gordon and Lewis, 1998), but historical data has now clarified the situation (Gordon, Campbell, Hay, Maclagan, Sudbury, and Trudgill, 2004). It is now clear that the earliest immigrants to New Zealand brought relatively raised tokens of both TRAP and DRESS with them, but that both vowels continued to raise after the immigrants arrived in New Zealand. Auditory analysis of 115 speakers and acoustic analysis of ten speakers (Gordon et al, 2004) showed that TRAP started to raise before DRESS. For speakers born during the nineteenth century, there is little evidence of the centralisation of KIT, which is a highly salient characteristic of modern NZE pronunciation. However there was sufficient KIT centralisation to demonstrate that the front vowel movement is a push chain not a pull chain. Speakers born after 1900 show increasing KIT centralisation (Langstof, 2003) and thus confirm that the front vowels are involved in a chain shift which is a push chain.

Over the last five to ten years, it has become evident that DRESS is continuing to raise in NZE. Informal observations from academic visitors to the University of Canterbury indicate that the raised NZE DRESS vowel creates considerable confusion, especially for Americans. Auditory analysis of speakers in the Canterbury Corpus (for corpus details see section 2.1) confirmed that DRESS is continuing to raise. It also showed that this raising is not stigmatised, in that women from the higher social classes were leading in the change (Maclagan, Gordon and Lewis, 1999; see Labov, 1990 for a discussion of the relationship between social class and sound change). Rather than continuing to raise DRESS, some speakers in the Canterbury Corpus broke the vowel into a diphthong, so that, together with the effects of the NEAR/SQUARE merger, (Gordon and Maclagan, 2001) *bed*, *beard* and *bared* all rhymed (see Batterham, 1995 for further evidence of DRESS breaking before /d/). This diphthongisation of DRESS is restricted to the older speakers in the Canterbury Corpus with the younger speakers continuing to raise DRESS rather than break it (see Maclagan, 1998).

The first acoustic evidence of the continued raising of DRESS came from nine speakers, aged fourteen and recorded in 1983 whose DRESS vowels were closer than their FLEECE vowels (Maclagan, 2000b). However because similar speakers born ten years later did not show the same trend, evidence from the 1983 speakers was regarded at the time as an aberration.

This paper presents an acoustic analysis of 80 speakers from the Canterbury Corpus and shows that these speakers have continued to raise DRESS so that it is as close as FLEECE. For some speakers, the DRESS and FLEECE vowel spaces totally overlap. We also present evidence that FLEECE is becoming increasingly diphthongal. Speaker groups for whom DRESS and FLEECE largely overlap in acoustic space have relatively pronounced on-glides for FLEECE.

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2. Data

2.1. Speakers

The Canterbury Corpus contains material collected by students in the NZE course at the University of Canterbury (see Maclagan and Gordon, 1999). The corpus is structured so that it contains approximately equal numbers of men and women, of younger speakers (aged 20-30) and older speakers (aged 45-60) and speakers from higher social classes (described as professional) and lower social classes (described as non-professional). Data collection started in 1994 and the corpus currently consists of 400 speakers. The speakers chosen for this analysis are a subset of 80 speakers, 10 from each cell. Table 1 gives the demographic information for the speakers. Social class is calculated by adding together an occupation measure (Elley and Irving, 1985) and an education measure. Each measure has a value of 1 (high) to 6 (low), and the combined measure ranges from 2 (high) to 12 (low).

Table 1: Demographic details of speakers

		Age		Social Class	
	n	mean	sd	mean	Sd
MYP	10	26.20	6.23	3.71	1.06
MYN	10	23.42	3.02	9.61	1.09
MOP	10	50.30	3.89	4.89	2.88
MON	10	52.90	4.84	8.95	2.14
FYP	10	23.89	2.85	5.10	2.13
FYN	10	24.00	4.03	9.33	1.94
FOP	10	51.00	5.45	5.20	1.87
FON	10	50.11	5.11	10.60	1.43

M=male, F=female, Y=younger, O=older, P=professional, N=non-professional. Social class scores range from 2 (high) to 12 (low).

2.2. Material

Vowels from the NZE Word List were analysed acoustically (see Maclagan and Gordon, 1999 for the full word list). Each speaker produced each line once, reading from a laminated card containing the entire word list. The focus of this analysis is the acoustic analysis of eleven tokens of DRESS and five tokens of FLEECE for each speaker:

- 5. bet, bed, beck, beg, Ben
- 10. beat, bead, beak, bean
- 17. … head … heed …
- 20. ten, shed, add, yes, end, bed

The speakers were recorded on Sony Walkman recorders (various models). The tokens were digitized on SndSampler™ (44100 Hz, 16 bit) and analysed in Emu/R (http://emu.sourceforge.net). Formants were automatically generated and hand corrected. The data were hand labeled and vowel targets were marked. The targets were taken during the steady state portion of the vowel. If there was no steady state, formant readings were taken at the F2 maximum (and F1 minimum). For length measurements, consonant transitions were included within vowel measurements, so long as vowel formants could be seen.

2.3 Results

Figure 1 shows the overall vowel spaces for the men and the women whose DRESS and FLEECE vowels are the focus of this paper. It can be seen that FLEECE and DRESS are extremely close together, especially for the women. Figure 2 shows the results for FLEECE and DRESS only for each of the eight speaker groups. The ellipses enclose 95% of the tokens for each vowel. DRESS is lower than FLEECE for the older speakers and for the younger, male, professional speakers.

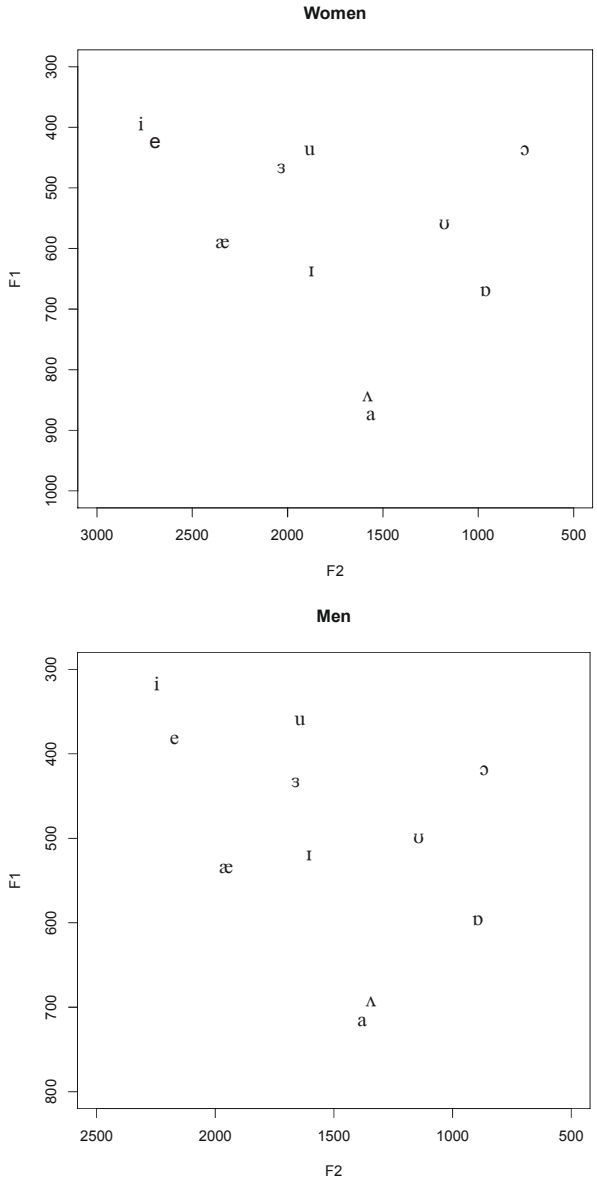

Figure 1: Vowel spaces for all men and women

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However for the younger, male non-professional speakers and the younger female speakers, DRESS and FLEECE become closer, until for the younger, non-professional female speakers, DRESS and FLEECE are in the same position, and their ellipses overlap totally.

This raises the question of how DRESS and FLEECE are kept apart for the younger speakers. Length measurements show that FLEECE is longer than DRESS for all speaker groups. Note there are different numbers of DRESS and FLEECE words with following voiced and voiceless consonants in the word list. A slightly higher percentage of FLEECE words (33%) than DRESS words (27%) have final voiceless consonants and will therefore be relatively shortened. The length differences obtained between FLEECE and DRESS words may therefore underestimate the actual length difference. The male speaker groups all have shorter FLEECE vowels than the female speaker groups, and also tend to have shorter DRESS vowels. Because both vowels tend to be shorter for males, we consider this likely to be an effect of speech style. More revealing is the ratio between the length of the two vowels.

The lengths for FLEECE and DRESS and the FLEECE/DRESS ratio are shown in table 2. The groups are listed in order of increasing FLEECE/DRESS ratio. The groups with the lowest FLEECE/DRESS ratio, and thus the least length difference between DRESS and FLEECE are the older male and female professionals. As seen in figure 2, both these groups keep the two vowels acoustically well separated. The group with the largest ratio is the younger, non-professional males, the male group for whom DRESS and FLEECE are closest together. They have relatively shorter DRESS vowels than the other groups.

The older speakers tend to have the least length difference between DRESS and FLEECE. An exception is the female older non-professionals, who are also the most innovative of the older group in terms of F1-F2 space. This pattern therefore suggests that the existing length difference between DRESS and FLEECE may be being exagerrated as a reaction to the encroachment of DRESS upon FLEECE's acoustic space. Of course, the length may not be the only difference, as figure 2 shows only a single target of the vowel. We turn now to a discussion of the vowel trajectories for the two vowels

Figure 3 presents time-normalised formant tracks for FLEECE and DRESS for each speaker group. Compared with DRESS, FLEECE has a clear on-glide for all speaker groups and reaches its target frequency later. The older male and female professional groups have less pronounced on-glides than the other groups, which likely accounts for their smaller FLEECE/DRESS length ratio difference presented in table 2. Note, again, that these groups are particularly conservative in acoustic space (figure 2). The younger male non-professional speakers and both groups of younger female speakers, whose DRESS and FLEECE vowel spaces largely overlap, all show relatively pronounced on-glides for FLEECE. This diphthongization will help to differentiate the two vowels

Table 2: length of FLEECE and DRESS

Group	FLEECE	DRESS	Ratio
FOP	206.0568	181.4492	1.135617
MOP	184.9332	162.0851	1.140964
MON	202.0657	173.3429	1.165699
MYP	193.9512	165.1208	1.174602
FYN	207.1789	175.4194	1.181049
FYP	203.3301	169.1553	1.202032
FON	210.3182	171.4384	1.226786
MYN	186.7142	144.7933	1.289522

3. Discussion

The results indicate that the New Zealand DRESS vowel has continued to raise, leading to extreme overlap in the acoustic space of FLEECE. It appears that FLEECE has begun to react to this intrusion by the development of a more pronounced on-glide which helps to differentiate the two vowels. Perhaps paradoxically, then, the long vowel FLEECE, is now being affected by the New Zealand "short front vowel" shift.

Taken as groups, none of the sets of speakers analysed here show the results found in the younger speakers recorded in 1983, with DRESS closer than FLEECE (Maclagan, 2000b). However individual speakers in the younger, non-professional female group do pronounce DRESS closer than FLEECE. Figure 4 shows two speakers, FYN 5 and FYN 9, for both of whom DRESS is closer than FLEECE. For FYN 9, FLEECE is just front of DRESS, but for FYN 5, FLEECE is more central than DRESS, a pattern we have also seen in some more recently recorded speakers. It is possible that FYN 5 is showing the start of a movement whereby, as well as having a marked on-glide, FLEECE is becoming more central, and leaving DRESS as the closest front monophthong in the NZE vowel system. The fact that FLEECE is reacting to the high DRESS vowel, (certainly by further diphthonging, and perhaps by centralisation) appears at first glance curious. FLEECE is a long vowel, and so belongs to a different subsystem than the short vowels, and should theoretically not be affected by their movement. The fact that it is affected could be taken as evidence in support of Labov's (1994:285) claim that the New Zealand short front vowels are in fact tense, and thus in the same subsystem as FLEECE. The NZE short front vowels would then not provide a counter-example to the generalisation that short vowels fall in chain-shifts.

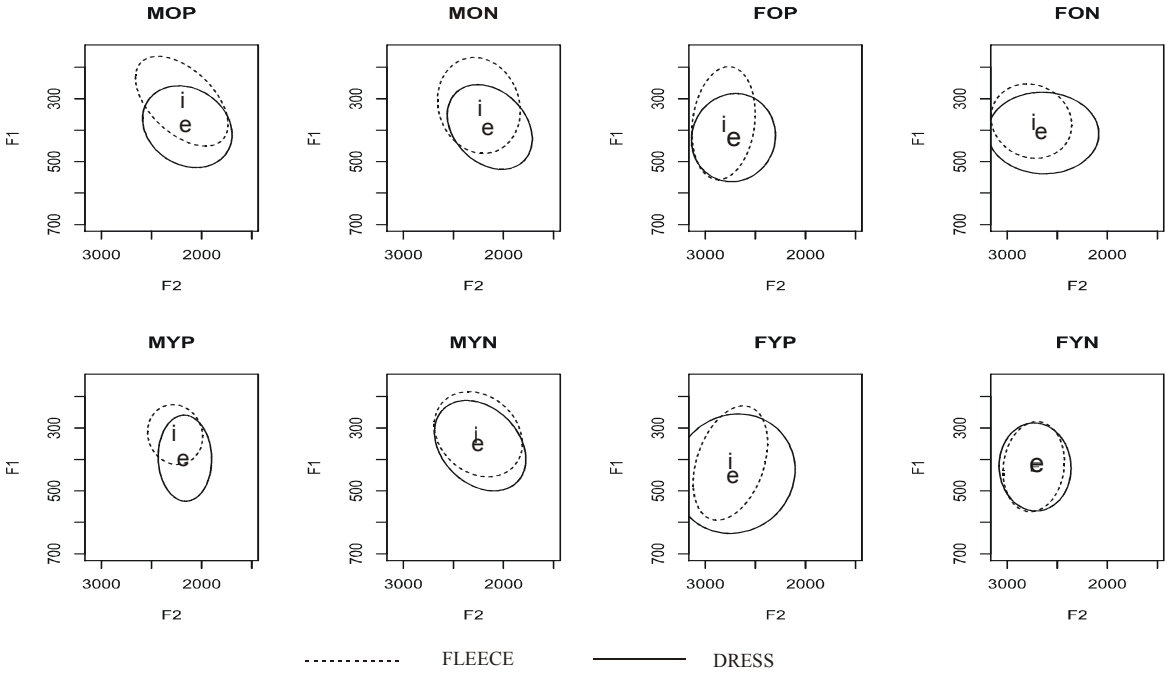

Figure 2: ellipse plots for FLEECE and DRESS for all speaker groups. M=male, F=female, P=professional, N = non-professional, Y=younger, O=older

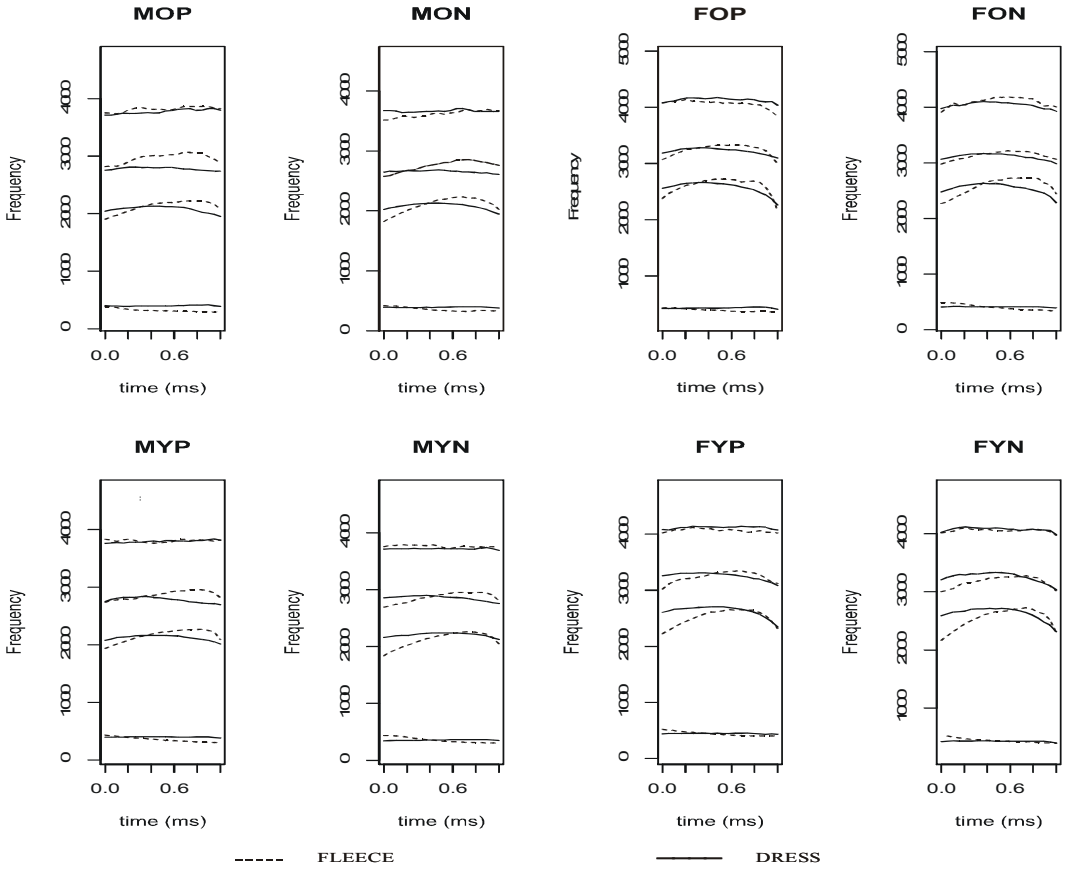

Figure 3: Time-normalised formant tracks for FLEECE and DRESS for all speaker groups.

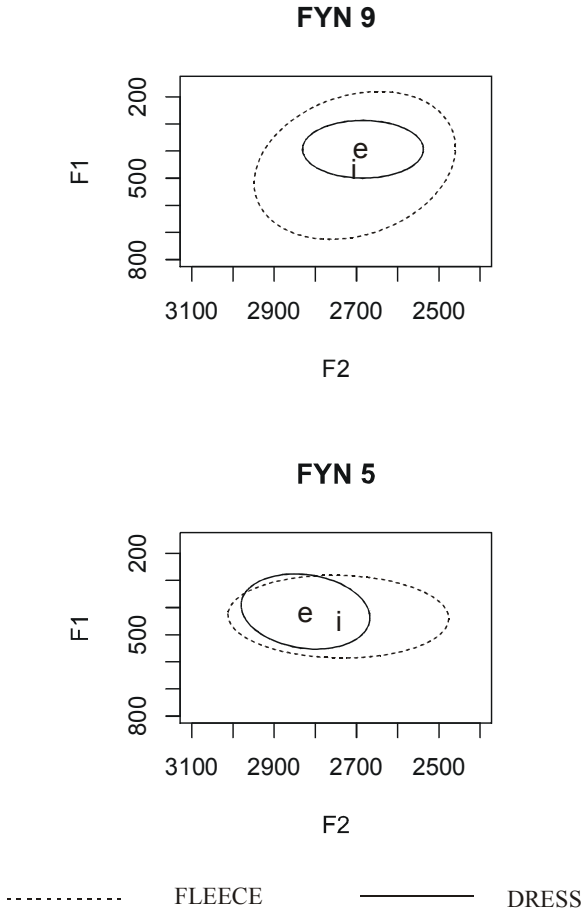

Figure 4: examples of two speakers for whom DRESS is closer (higher) than FLEECE.

Other evidence that the NZE front vowels are tense comes from length measurements provided by Watson, Maclagan and Harrington (2000). In English, vowels that are close (high) are usually shorter than more open vowels (Wells 1962). However Watson et. al noted that as KIT and DRESS rose for the four speakers they studied, they did not decrease in length, perhaps indicating a shift towards tensed status. The fact that traditionally short vowels are raising in a chain shift demonstrates that NZE does not follow the more 'traditional' principle whereby short, lax vowels fall (Labov, 1994: 138). The fact that these vowels did not show shortening as they raised suggests that the NZE 'short' front vowel system may not be as anomalous as it appeared when Labov first set out his principles of chain shifting (1994).

With the centralization of KIT for most current NZE speakers (and for all the speakers included in this study, see figure 1 above) DRESS now remains as the closest of the traditional short vowels. If FLEECE centralizes, NZE will be left with DRESS as the closest front vowel in the entire vowel system. If this were to happen, it would suggest that the traditional distinction between longer and shorter, tense and lax vowels has broken down in the NZE vowel system.

Labov indicates two possible outcomes as front vowels rise in a chain shift. Vowels can leave the front peripheral series via the mid-exit principle or the upper exit principle (1994:602). Both principles involve diphthongization: via the mid-exit principle, tense mid-close long vowels develop in-glides, and via the upper exit principle, long close monophthongs develop either in-glides or up-glides. In both cases, the vowels leave the system of monophthongs and become diphthongs. At one stage, NZE DRESS developed an in-glide for some speakers (Maclagan, 1998) and seemed set to leave the monophthong system via the mid-exit principle, even though it is traditionally regarded as a short vowel not a long vowel. However this option did not continue over time, and DRESS now continues to raise as a monophthong.

To use Labov's terminology, FLEECE is becoming an increasingly upgliding diphthong. Although it has been noticed for some time, the on-glide for NZE FLEECE has been reported as auditorily less pronounced than the on-glide for Australian English FLEECE. Turner (1966:96), for example, indicates that the on-glide for NZE FLEECE is [ii] or [ei] rather than the Australian English [əi], and Wells (1982) comments that NZE FLEECE is less diphthongized than for Australian English. In a more recent study, however, Watson et al. (1998) find no significant difference in degree of diphthongization between NZ and Australian FLEECE. Figure 3 shows that NZE FLEECE does have a visible on-glide for all speaker groups, and that this appears to be becoming more pronounced. It therefore appears to be affected by the New Zealand "short front vowel" shift, and to be behaving in a manner consistent with the upper exit principle.

4. Conclusions

This paper has presented an acoustic analysis of the DRESS and FLEECE vowels of 80 New Zealanders. The results show that DRESS continues to raise in contemporary New Zealand English. DRESS and FLEECE now completely overlap in acoustic space for many young speakers, and for some innovative individuals DRESS has risen above FLEECE and can be more front than FLEECE. We argue that changes in the trajectory of FLEECE have arisen as a consequence,

making FLEECE a part of the New Zealand "short front vowel" shift. Current analyses of Australian English indicate that both TRAP and DRESS are falling for innovative speakers, in particular for young 'hyper general' females (Cox, 2004). If NZE DRESS continues to raise and Australian English DRESS falls, this will increase the differences between the two varieties of English.

5. Acknowledgements

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