"But he's not supposed to see me in my weeding dress!"-The relationship between DRESS and FLEECE in modern New Zealand English.[1]

Jayne McKenzie

University of Canterbury

1. Introduction

A fair amount is known about the three short front vowels of New Zealand English (NZE). These vowels can be described using the lexical set words KIT, TRAP and DRESS, representing /I/, /æ/, and /e/ (Wells 1982:117-183). DRESS and TRAP are typically raised in modern NZE, and KIT is centralised. It has been argued that these three vowels have been involved in a push-chain shift (Gordon et al, 2004:265-266), with TRAP raising towards the acoustic space of DRESS, and DRESS responding by raising towards KIT, then KIT centralising away from DRESS. DRESS is said to be still raising in modern New Zealand English (Maclagan 1998:53, Maclagan and Hay 2004). The question arises as to what FLEECE or /i:/ will do (if anything) as DRESS raises towards its acoustic space, and we start to lose the quality distinction between these two vowels.

The shrinking distinction between the vowels /i:/ and /e/ in New Zealand English sometimes leads to miscommunication. The word 'ten' for example, could be mistaken for 'teen', or 'Czech' for 'cheek'. Are we dealing with a merger-in-progress, or are there still robust quality and/or quantity differences between these vowels? What is it that creates confusion in the perception of /e/ and /i:/?

There has not been a great amount of work done previously on the relationship between DRESS and FLEECE. In her 1998 paper looking at diphthongisation of DRESS, Margaret Maclagan made the suggestion that FLEECE (like DRESS) is diphthongising for some speakers, and that this occurs in speakers with close variants of /e/ (Maclagan 1998:52). She also suggested that /e/ is so raised in some speakers, that it is "distinguished from /i/ mainly by length" (Maclagan, 1998:52). In some more recent research, Margaret Maclagan and Jen Hay have looked specifically at the DRESS and FLEECE vowels. Their research involved looking at these vowels in the wordlists of 80 Canterbury Corpus NZE speakers (see section 2) born between 1995 and 1999. They have shown that in some speakers, DRESS in fact occupies the same acoustic space as FLEECE, and in most speakers there is

a great deal of crossover in the distribution of the two vowels. They also found that FLEECE is often diphthongised, and saw evidence of it being more centralised in some speakers. These features were particularly evident in the younger, non-professional speaker categories. Maclagan and Hay (2004) argue that these reactions by FLEECE to the raising of DRESS suggest that FLEECE is being affected by the NZE "short" front vowel shift.

The aim of this paper is to examine the relationship between DRESS and FLEECE, analysing them in a similar way to Maclagan and Hay's study – by length, acoustic space, and formant tracks over the duration of the vowel. In addition to using wordlist recordings, these vowels will also be investigated in casual speech, in order to give a more accurate picture of what people actually produce in everyday conversation. Using both wordlist and casual speech from each speaker allows comparisons between different contexts. Because the data presented here includes some younger and more recently recorded speakers than Maclagan and Hay's, a comparison should show any further developments in the relationship between /e/ and /i:/. Using the same methods and the same wordlist as Maclagan and Hay allows a direct comparison between their study and this one.

2. Sample

This analysis looks at a sample of eight speakers chosen from the Canterbury Corpus. The Canterbury Corpus is a group of recordings held at the University of Canterbury[2]. These recordings consist of wordlists designed to elicit certain features of NZE, and interviews aimed at eliciting more casual, conversational-style speech. The speakers were all born between 1930 and 1984 and are considered to be speakers of 'modern' New Zealand English. Each speaker is categorised according to sex, age, and a social class grouping. Age is classified by a binary distinction: "older" for speakers approximately 45-60 years old at the time of recording, and "younger" for those approximately 20-30 years. Speakers were classified as "non-professional" if they had had no tertiary education, had a "manual" or "unskilled" occupation, and their parents also had manual/unskilled occupations, with the opposite characteristics being true for "professional" speakers. Of course, the speakers did not all fit these descriptions neatly, and this type of classification is not without problems; however it at least gives us some indication of social class, which can be investigated as a linguistic predictor. Speakers have been labelled according to these features, so for

---

[2]The data was collected by members of the New Zealand English class of the Linguistics Department, University of Canterbury. The work done by members of the Origins of New Zealand English project (ONZE) in preparing the data, making transcriptions and obtaining background information is also acknowledged. A more detailed description of the Canterbury Corpus exists in Gordon and Maclagan (1999).

example, a person who is female, younger, and non-professional is labelled "FYN".

The data in this report comes from a sample of eight speakers, all of whom were chosen at random from the 'younger, non-professional' category of the Canterbury Corpus. On average, the females were born 7.25 years later than those looked at by Maclagan and Hay (2004). The males were born on average 2.67 years later than those in Maclagan and Hay, making the total sample of this study younger on average than Maclagan and Hay's sample. The speakers used here were recorded between 1996 and 2004, which is more recent than the speakers from the same categories looked at by Maclagan and Hay, who were recorded between 1995 and 1996.

Table 1: Ages of speakers in this study

Name, year of recording		Year of birth
FYN 1	1996	1976
FYN 2	1998	1978
FYN 3	2002	1977
FYN 4	2004	1984
Average all FYN		1978.75
MYN 1	1996	1972
MYN 2	1998	1975
MYN 3	2002	1982
MYN 4	2004	1972
Average all MYN		1975.25

This is quite a restricted sample, but being a small study, it seemed sensible to concentrate on a particular category. The younger, non-professional group was chosen because it seemed likely that it might be a good place to start in looking for a change in the relationship between DRESS and FLEECE. Janet Holmes has suggested that in many cases of linguistic change, it is younger people who introduce the change. She also says that "lower-class speakers are more influential in spreading less conscious linguistic changes" (Holmes, 2001). A quick analysis was made prior to this study, of eight speakers from the Canterbury Corpus who were recorded in 2004, and who each belong to different categories. In this small analysis, the speakers who showed the most overlap of DRESS and FLEECE were the younger, non-professionals, and also the younger, professional female. It would however, be very interesting to make comparisons across all speaker categories.

For each speaker, the Canterbury Corpus wordlist (Gordon and Maclagan, 1999:50-58) provided eleven tokens of DRESS and five of FLEECE in the

following words: *bet, bed, beck, beg, Ben, beat, bead, beak, bean, head, heed, ten, shed, yes, end, bed*. For each speaker at least ten tokens of DRESS and ten of FLEECE were pulled out at random from a section of the interview. Any cases where the vowel was very unstressed were ignored, as were repetitions of the same word. The interviews provided tokens from a wide range of phonological environments. No attempt was made to control the number of times a vowel occurred within a particular surrounding environment; however with the number of tokens per vowel, per speaker, it seemed unlikely that any significant biases would occur. When looking at the results, it must be remembered that the wordlist data is quite unbalanced. There are only five tokens of FLEECE, four of these occur after /b/. However, the wordlists are still useful, as they give the same set of words from each speaker, allowing a direct comparison.

3. Method of Analysis

The tokens were chosen by looking at the transcript of the interview or wordlist, and choosing words which belong to either the DRESS or FLEECE lexical set. These tokens were then transferred into 'Emu Speech Database System', which made it possible to track the formants of each vowel. One target point was marked for each of the DRESS tokens, at which formant readings for F1 and F2 were taken. These readings were taken at the most stable part of the vowel. Because of the suspected diphthongisation of FLEECE, two targets were marked for this vowel, the first being at the most stable point of the first part of the diphthong; however there was often no real stable point, so I tried to mark a consistent way into the vowel each time. The second target was marked at a stable point in the second part of the diphthong; this was much easier to distinguish. The beginning and end points of each vowel were also marked, allowing a length measurement to be taken, and the surrounding phonological environments were described. This data was then analysed using the statistical programming package 'R'.

4. Results

4.1 Acoustic space of DRESS and FLEECE

The following vowel plots show one target point for DRESS in casual speech, and two targets for FLEECE, illustrating its movement (i represents the onset of the vowel, and i: the target). As can be seen in Figure 1, there is a great deal of overlap in the acoustic spaces of DRESS and FLEECE in both the male and female speaker groups. The central points are all very close together, in fact FLEECE seems to almost pass through the space of DRESS as it becomes closer and fronter. The end point of FLEECE for females seems to be lower in

comparison to DRESS than that of the males; the whole vowel sits on average below DRESS, whereas for the males FLEECE ends at about the same height as DRESS. The distributions of the vowels as illustrated by the ellipses are very similar; the starting point for FLEECE may occur slightly lower and more central than DRESS.

There is some variation between individual speakers as to whether DRESS occurs higher than FLEECE or not, it can be seen that "MYN 1" produces DRESS higher than FLEECE, but "FYN 2" has it just lower (Figure 2).

Figure 1: Distribution of DRESS and FLEECE in casual speech.[3]

Dashed ellipse = onset of i:
Dotted ellipse = target of i:
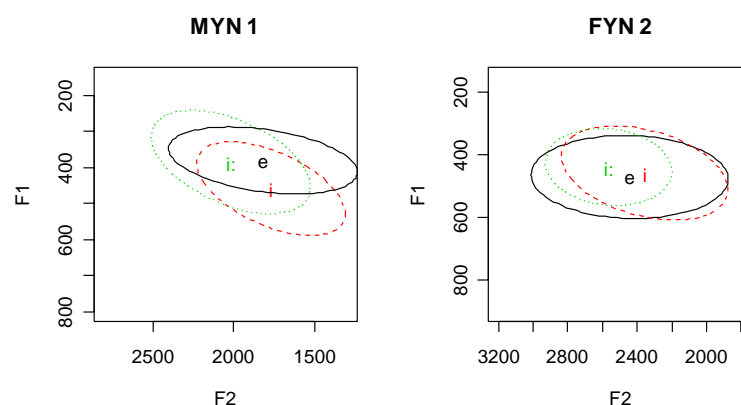Solid ellipse = e
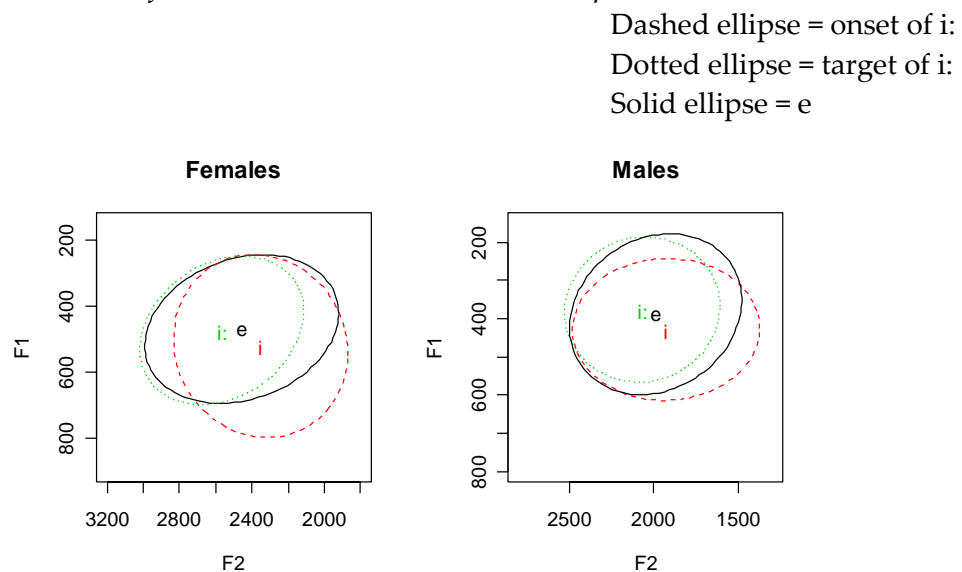
Figure 2: Distribution of DRESS and FLEECE in casual speech -two individuals.

If we compare this casual speech data (Figure 1) to the wordlist data (Figure 3), we can see that the average for both male and female speaker groups is to have the starting point of FLEECE much more central than DRESS, and the end points

---

[3] Ellipse plots and trajectories show averages across all speakers unless otherwise stated.

in roughly the same position. This difference between casual and wordlist speech is very interesting. Speakers tend to be more aware of their own speech when reading wordlists, and try to exaggerate their pronunciation towards the more conservative features, so it is interesting that they seem to be exaggerating towards a more centralised FLEECE onset, and a DRESS which is around the same height as the second target of FLEECE. Both of these are variants that are more modern. This suggests that these variants are not strongly stigmatised, and are perhaps 'below the level of consciousness' (Labov, 1994).

Again, there is variation between speakers. As shown in Figure 4, some speakers produce FLEECE as a whole more centralised than DRESS (eg. FYN 4), whereas for others (eg. FYN 2) FLEECE starts more centralised than DRESS, and ends further forward.

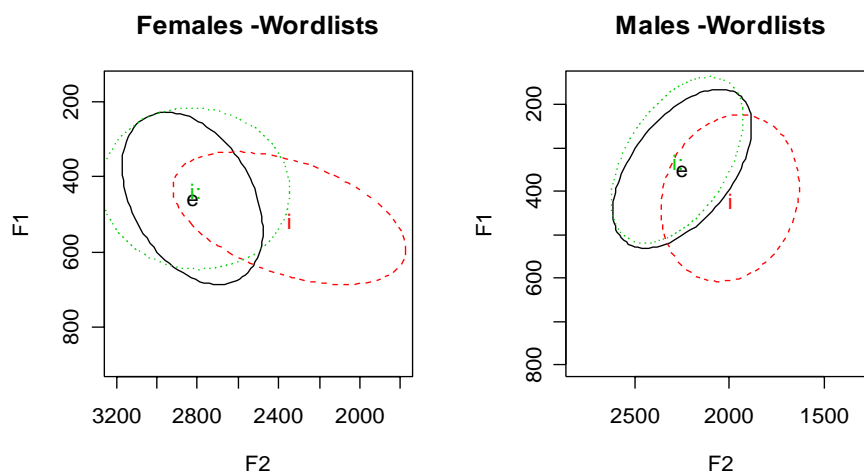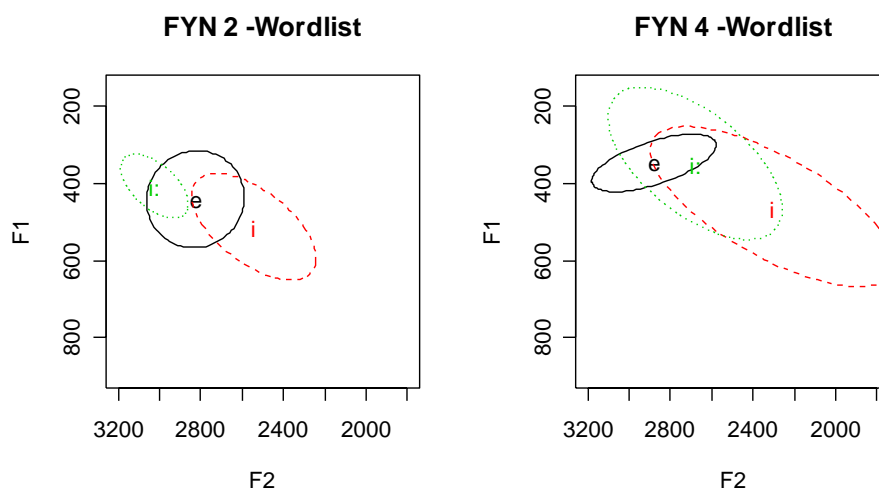*Figure 3: Distribution of DRESS and FLEECE in wordlists.*

Figure 4: Distribution of DRESS and FLEECE in wordlists –two individual speakers.

As can been seen in Figure 5, FLEECE is diphthongised on average across speakers, becoming fronter and closer over its duration. This is slightly stronger in the female speakers than in the males. DRESS appears to be relatively monophthongal. It is also interesting that for most speakers (Figure 6) FLEECE starts lower than DRESS and finishes higher. When we look at the speakers individually it seems that there is more diphthongisation of FLEECE by female speakers than by males (Figure 6).

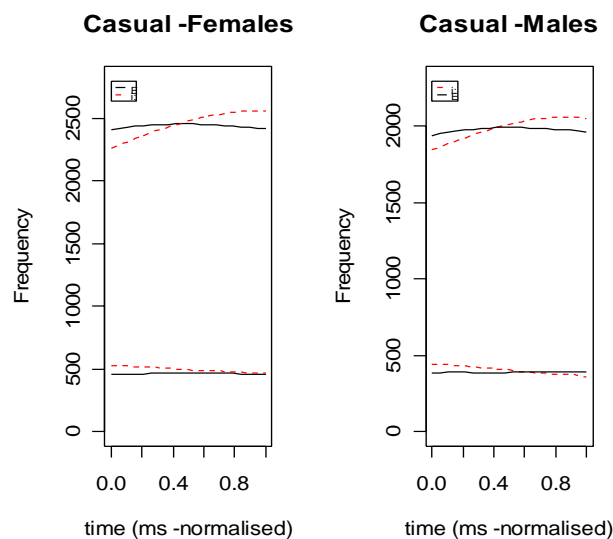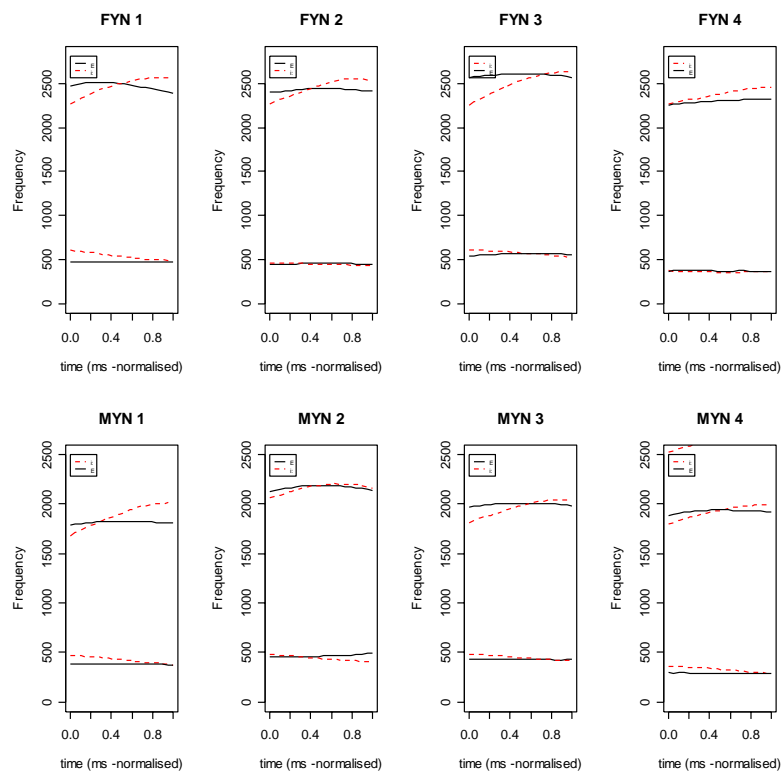*Figure 5: Trajectories of DRESS/FLEECE in casual speech.*

Figure 6: Trajectories of DRESS/FLEECE in casual speech –individual speakers.

Compared with the trajectories from the casual speech tokens, the wordlist trajectories show an even greater diphthongisation of FLEECE (Figure 7). This again might relate to the fact that the speakers are being more careful in their speech, by way of exaggerating it, and again it is interesting that these speakers are in fact exaggerating towards the more 'innovative' variant. The stronger diphthongisation in the wordlist speech might be affected by the speed of speech. The wordlists have generally been read at a slower speed than casual speech, allowing more time for a full diphthong to be realised. The DRESS vowel is also higher in the wordlists than in casual speech, which is again a move towards the more modern variant. As mentioned earlier, the nature of the wordlist data might be influencing these results as the majority of the FLEECE tokens occur after /b/. This is probably affecting the first part of the vowel, bringing F2 down. This makes the diphthongisation appear to be stronger, which might not actually be the case if the tokens were spread over different environments as they are in the casual speech data. This should not however, be affecting the height readings of F2 for DRESS, although a slight on-glide for DRESS can be seen, probably also because of the b-initial tokens.

Figure 7: Trajectories of DRESS/FLEECE in wordlists.
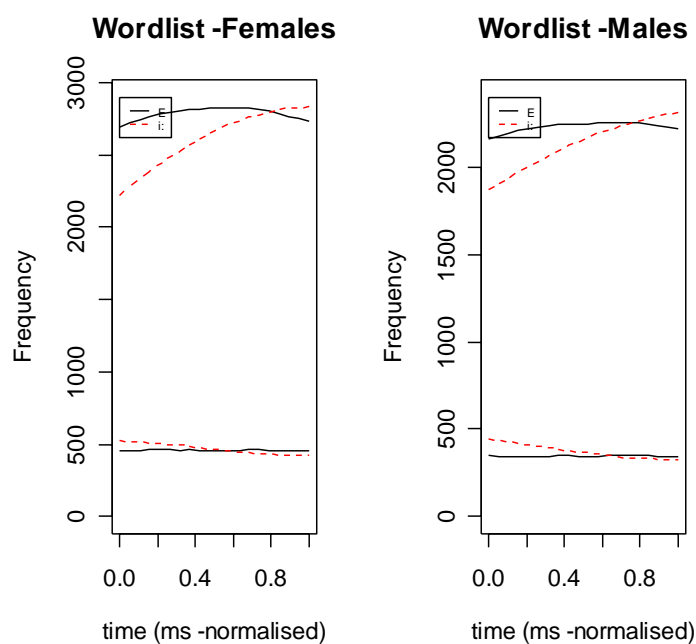
Looking at the wordlist data only, these results show some progression from the speakers analysed by Maclagan and Hay (2004). A comparison of the trajectories shows slightly more diphthongisation of FLEECE by both males and females. This could be taken to suggest that FLEECE is becoming more diphthongal over time, as this study includes younger speakers than those in Maclagan and Hay's. In terms of acoustic space (Figure 3), the finishing points of both the vowels are

quite similar between the two studies. In both cases there is almost complete overlap of the vowels in terms of acoustic space when shown on a vowel plot.

4.3 Length

On average, these speakers produce FLEECE longer than DRESS in casual speech (Figure 8). There was very little gender difference here, so the two groups have been collapsed into one. The majority of DRESS tokens are quite concentrated at around 60ms, with the longest tokens at around 125ms, whereas there is more of a spread for FLEECE which averages about 25ms longer than DRESS. The longest tokens for FLEECE are around 230ms.

If we look at some individual speakers however, three of them produce the two vowels at very similar lengths on average (Figure 9), and there are very few of their FLEECE tokens which are considerably longer than DRESS. There are no tokens of DRESS which are longer than the longest FLEECE. So it seems that for most speakers these two vowels are still distinguished by length, but interestingly there is overlap for some. It is likely that there are many other factors influencing the lengths of these vowels. Perhaps more tokens would be needed in order to look at length without the influence of surrounding environments.

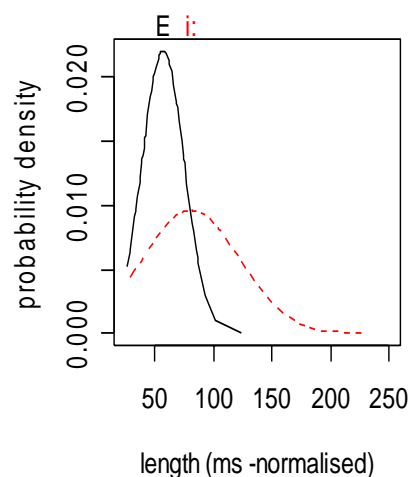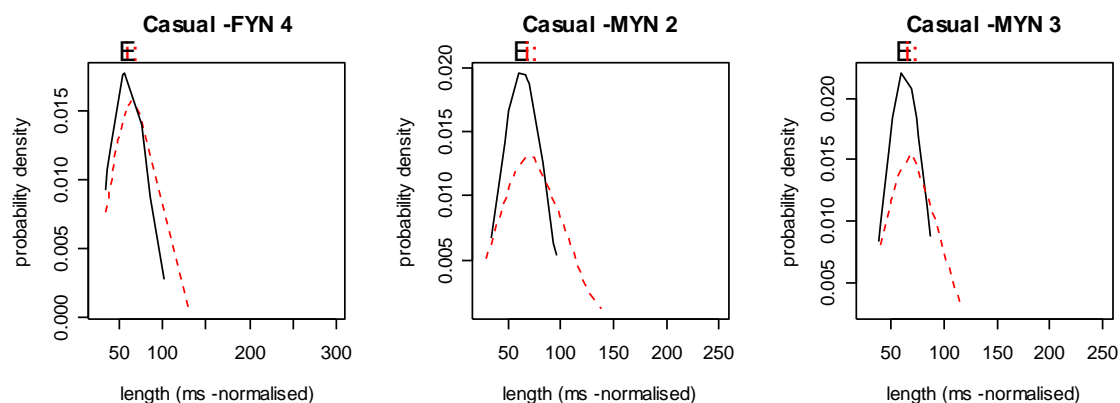*Figure 8: Length of DRESS/FLEECE across all speakers –casual speech*

Figure 9: Length of DRESS/FLEECE in casual speech –three individuals.

There seems to be no strong correlation for individual speakers between having DRESS and FLEECE at similar lengths and their realisation of the vowels, but the three speakers with the two vowels at similar lengths do not show strong FLEECE diphthongisation, and do not have strongly centralised variants of FLEECE. I would have expected, as shown in Maclagan and Hay's research, that the speakers who have the greatest amount of acoustic crossover for the two vowels, would have more difference in terms of length, in order to be able to distinguish between them more easily. However this does not appear to be true in this data.

The lengths of the vowels are on average considerably longer in the wordlist speech (Figure 10) than in the casual speech (Figure 8). They average at around 150-175ms, so it is clear that the wordlist provides quite a different environment from that of conversational speech. The relationship between DRESS and FLEECE here is similar to the casual speech in terms of average length, and FLEECE is still longer than DRESS. However, there is less spread in the distribution of the /i:/ tokens. /i:/ is more concentrated at one length (Figure 10), as one would expect from a 'rhythmical' wordlist reading. When divided by sex, it seems as though the females have FLEECE closer in length to DRESS than the males do, but as this comes from only two of the four females, there is insufficient data to be able to make any generalisations for the wordlists.

Figure 10: Length of DRESS/FLEECE in wordlists.
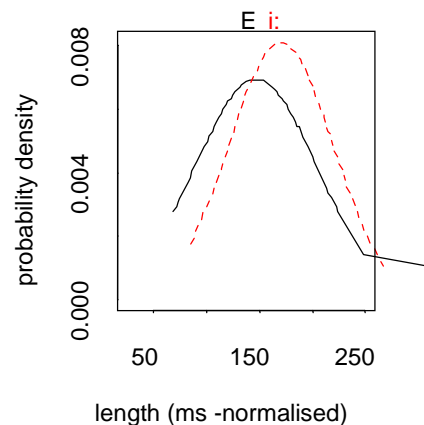
Compared with Maclagan and Hay's results, the ratios between the lengths of DRESS and FLEECE in the wordlists have not changed a great deal. Maclagan and Hay found the ratio between DRESS and FLEECE for FYN speakers to be 1.18, whereas here it is slightly less, at 1.12 (Table 2). For MYN speakers they found it to be 1.29, here it is 1.24. These differences between the ratios in Maclagan and Hay's study and in this one are not significant, but if anything, suggest that the difference in length between DRESS and FLEECE has become less for both FYN and MYN speakers.

Table 2: Lengths of FLEECE and DRESS in wordlists.

	FLEECE	DRESS	Ratio
FYN	180.2	160.8	1.12
MYN	164.2	132.8	1.24

Christian Langstrof has suggested that New Zealand English DRESS and TRAP are not really 'short' vowels; that they are longer than KIT and should perhaps be seen as 'non-short' vowels (Langstrof, 2004). This is consistent with the observation that some speakers have DRESS and FLEECE at about the same average lengths. The idea that DRESS and TRAP are 'non-short vowels' might make it easier to conceive that FLEECE is becoming involved in the so-called 'short' front vowel shift, because perhaps DRESS is not really as short as it is thought to be.

5. Summary of main findings

Overall, the speakers in this study show great overlap in many of the features of DRESS and FLEECE. In terms of acoustic space, the two vowels are produced in quite close proximity to each other by many speakers, and by some they actually overlap. Another interesting feature is that FLEECE is very often diphthongised.

It generally starts further back and lower in the mouth than DRESS, and ends up higher and fronter. In some speakers, the whole FLEECE vowel is produced lower than DRESS. Most speakers showed FLEECE as being longer than DRESS, but there were some who had them at almost the same average length. The fact that FLEECE is behaving like this suggests that it is in fact being influenced by the raising DRESS, and thus involved in the short front vowel shift. On comparing these findings with those of Maclagan and Hay's similar, slightly earlier study, there appears to have been some advancement in the shift towards a FLEECE which is more diphthongal, and produced lower and backer than DRESS.

There is an interesting trend towards more innovative variants in the wordlists, such as a higher DRESS (compared with casual speech), and a more centralised and more diphthongised FLEECE. These effects are stronger in the wordlists than in casual speech, which is strange, because you would expect that because people are generally more careful with their speech when reading wordlists than in casual speech, they should produce the more conservative variants. The opposite of this appears to have happened here. The more innovative features have been produced in more careful speech, suggesting that the new variants are generally not marked, and not used consciously, otherwise speakers would be likely to avoid them in careful speech.

6. Suggestions for further study

It will be interesting to see how the relationship between these two vowels progresses, whether FLEECE does in fact continue to become more centralised than DRESS, and more diphthongal. Obviously, it would be worthwhile looking over all categories of speakers to see whether older or 'professional' speakers are showing these trends too. It would also be good to have more speakers representing each category and to analyse more tokens from each speaker to reduce any influence of the surrounding phonological environment. The wordlist remains quite restricted. A careful investigation into the differences arising between careful speech and casual speech might involve a new wordlist including DRESS and FLEECE in a selected range of environments; this would involve making new recordings. It would be useful to look further into the correlations between the lengths and acoustic spaces of the vowels, which perhaps would become clearer with more data.

References

Gordon, E. and M. Maclagan 1999. Data for New Zealand social dialectology: the Canterbury Corpus. New Zealand English Journal, 13: 50-58.

Gordon, E., L. Campbell, J. Hay, M. Maclagan, A. Sudbury, P. Trudgill 2004. New Zealand English: its origins and evolution. Cambridge, Cambridge University Press.

Holmes, Janet 2001. Language Change. In An Introduction to Sociolinguistics (2nd ed.). London, Longman.

Labov, William 1994. Principles of Linguistic Change. Oxford, Blackwell.

Ladefoged, Peter 2001. Vowels and Consonants. An Introduction to the Sounds of Language. Oxford, Blackwell.

Langstrof, Christian 2004. "How to save Labov from New Zealand English – How short are short front vowels?" Seminar, University of Canterbury.

Maclagan, Margaret 1998. Diphthongisation of /e/ in NZE: a change that went nowhere? New Zealand English Journal, 12: 43-54.

Maclagan, Margaret, and Jennifer Hay 2004. The rise and rise of New Zealand English DRESS. In the Proceedings of the Australian International Conference on Speech Science and Technology, December 2004.

Wells, J. C. 1982. Accents of English. Cambridge, Cambridge University Press.