The Short Front Vowels in NZE in the Intermediate Period[1]

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Introduction[2]

The following paper sums up some preliminary results that were obtained from an acoustic analysis carried out on 31 speakers of intermediate New Zealand English. It is the most extensive acoustic analysis so far on the Short Front Vowels (henceforward: SFVs) in New Zealand English, and the first one to be carried out on speakers born in that particular period. Most research on NZE has focussed on the modern language; in addition, the Origins of New Zealand English (ONZE) project has studied the language of first- and second-generation New Zealanders (cf. Gordon, forthcoming). Therefore, my project aims at bridging that gap to allow for a holistic view of the history of NZE phonology. With regard to the SFVs, my results strongly suggests that the stabilisation of the modern system (cf. section 2.3) came about in the Intermediate Period (defined as the period covered by the Intermediate Archive, discussed below).

Background

The Speakers

I analysed 31 speakers from the Intermediate Archive of New Zealand English (based at the University of Canterbury), which comprises recordings of speakers born between the 1890s and the 1930s (That is, 3rd and 4th generation New Zealanders). I subdivided the speaker sample into three age groups in order to allow for a rather detailed analysis of the linguistic developments within that period.

TABLE 1: 31 intermediate speakers, divided up into 3 age groups.

	MALE	FEMALE
EARLY (born before 1905)	Mr McC., N.C., C.N., J.M., V.S.	MrsB., L.A., J.S., N.A., D.-H.H., V.H., J.MacL.
MEDIUM (born 1910 – 1920)	R.W., B.G., J.J., E.Tw., E.R.	P.G., M.G., A.H., M.St., I.R.
LATE (born after 1925)	E.L., J.W., B.A., D.K.	J.C., MrsB., E.L., El.R., P.H.

[1] I would like to thank the *Deutscher Akademischer Austauschdienst* (DAAD) for their support and funding, as well as Elizabeth Gordon for allowing access to the ONZE corpus. I am furthermore grateful to my supervisors Dr. Jen Hay, Prof. Lyle Campbell and Dr. Margaret MacLagan for their support as well as to the participants of this year's conference of the New Zealand Linguistic Society in Wellington for their feedback.

[2] This article is a summary of a presentation I gave at this year's conference of the New Zealand Linguistic Society at Victoria University in Wellington. The research outlined below is part of my PhD program at the University of Canterbury.

The Analysis

The acoustic analysis was carried out using the PRAAT program for phonetic analysis (by Paul Boersma and David Weenink, http://www.fon.hum.uva.nl/praat/). For each token, the frequency values of the first two formants (F1 and F2) were measured. Only stressed tokens were measured. Measurements were taken at turning points in the F2 pattern for each vowel.

The Variables

I analysed between 50 and 100 tokens of each of the Short Front Vowels, i.e. the vowels in words like KIT, DRESS and TRAP[3] . The phonetic realisation of these vowels has frequently been commented on as being characteristic of New Zealand English (cf. Bauer 1986), in that they appear to have undergone a so-called 'chain-shift'; that is, the movement of one phonological segment triggers that of the articulatorily adjacent one(s) (for a general discussion of the mechanics of chain shifts see Labov 1994). In the case of New Zealand English, this means that the high vowel in KIT has a more centralised realisation than in other varieties of English, while the vowels in DRESS and TRAP underwent, and probably still undergo, a process of raising and fronting. This can be sketched as shown in Figure 1.

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[3] These words have a tradition of being used as cover terms in the literature on NZE for the vowels they contain (established by Wells 1982). I will adhere to this convention here, as it allows for a 'dialect-neutral' statement regarding etymological classes (for an excellent discussion of the problems with transcribing phonemic categories across dialects see Batterham, 1995). Since my research includes a more detailed analysis of these categories before certain phonemic environments, a more comprehensive selection of lexical (sub-)sets is also required. These include:

COVER TERM	CATEGORY	ENVIRONMENT
IN	KIT	After glottal stop
BIT	KIT	Before /t/
BID	KIT	Before /d/
TIP	KIT	Before /p/
RIB	KIT	Before /b/
KICK	KIT	Before /k/
BIG	KIT	Before /g/
SHIFT	KIT	Before /f/
GIVE	KIT	Before /v/
MYTH	KIT	Before /θ/
HITHER	KIT	Before /ð/
FISH	KIT	Before /ʃ/
THIS	KIT	Before /s/
HIS	KIT	Before /z/
HIM	KIT	Before /m/
TIN	KIT	Before /n/
SING	KIT	Before /ŋ/

The same system applies, *mutatis mutandis*, to the categories of DRESS and TRAP. Note that although some of the buzzwords may have two syllable, this is purely because I was not able to come up with a suitable monosyllabic word for that particular environment. No statements regarding syllable structure are implied in such cases.

RP[4]

POSITION	FRONT	CENTRAL
1		
2	KIT	
3		
4		
5	DRESS	
6	TRAP	
7		

NZE

POSITION	FRONT	CENTRAL
1		
2	(DRESS)	KIT
3	DRESS	
4	(TRAP)	
5	TRAP	
6		
7		

Figure 1: The position of the Short Front Vowels in Received Pronunciation (RP) and modern New Zealand English (NZE) in terms of relative heights, whereby 1 corresponds to IPA /i/ and 7 to /a/.

Results

Developments in the KIT Vowel

Whereas the earlier speakers (especially the males) from the sample are still rather close to the RP set-up sketched in Figure 1 above, the later ones have a system which is rather like the modern one, i.e. with a centralised KIT vowel and a high fronted realisation of DRESS. Figure 2 and 3 plot the formant frequency values of all SFV tokens of the early males vs. the late females, respectively.

[4] Since there is no general agreement as to what the ultimate input system for NZE looked like (in that raised realisations of TRAP and DRESS might have been brought over with the first settlers from the UK, cf. Gordon et al., forthcoming and Trudgill, 1986), it has to be conceded that this figure is rather schematic and simplistic. However, it captures two generalisations that are valid:

- Modern NZE has closer articulatory realisations for the vowels in TRAP and DRESS and a more centralised realisation of the KIT-vowel than other standard varieties.
- The modern system is different from that of the first generation of settlers, which implies that (parts of) the chain shift is/are endemic.

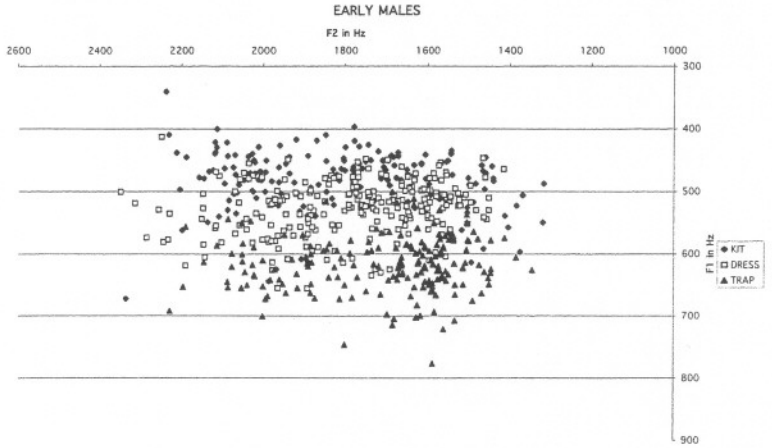


Figure 2: Scatterplot of all SFV tokens in the speech of the Early Males.

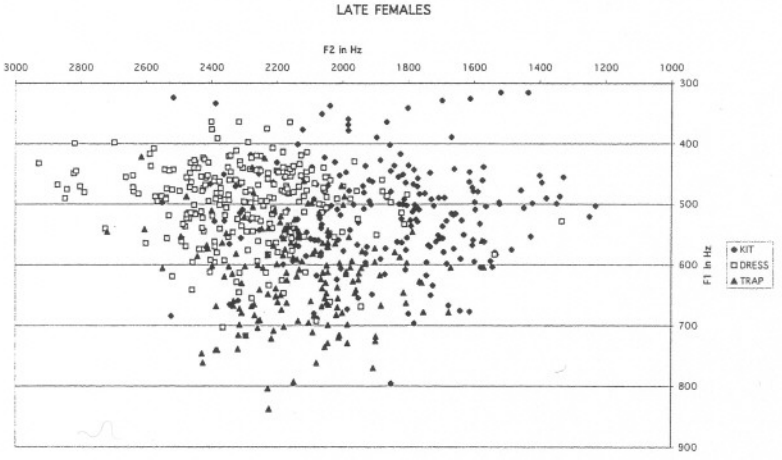


Figure 3: Scatterplot of all SFV tokens in the speech of the Late Females.

It should be obvious that the change within the 'Intermediate' generation was substantial. In addition, my research so far suggests that the process of KIT-centralisation came about less straightforwardly than it is generally assumed,

in that the early speakers from my sample go through an intermittent system in which the realisation of the KIT-vowel is highly sensitive to the phonemic environment in which it occurs. That is, early speakers differ vastly in their degree of centralisation of KIT depending on whether the vowel is followed by especially velar nasals/stops vs. labial nasals/alveolar fricatives. It seems as though these speakers were on the brink of splitting their KIT-vowel in much the same fashion as is reported by Lass (1987) for modern South African English, i.e. with a clear-cut allophonic distinction into a fronted and raised /i/ (much like the modern AusE realisation) and a centralised realisation within the etymological class of KIT. Figure 4 below plots the mean formant frequency values of 4 KIT-subclasses in relation to the DRESS-means in the speech of J.M., an early male speaker[5].

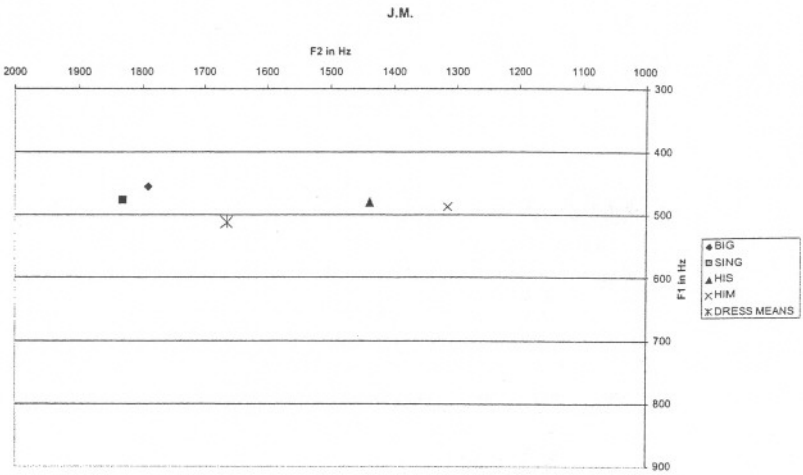
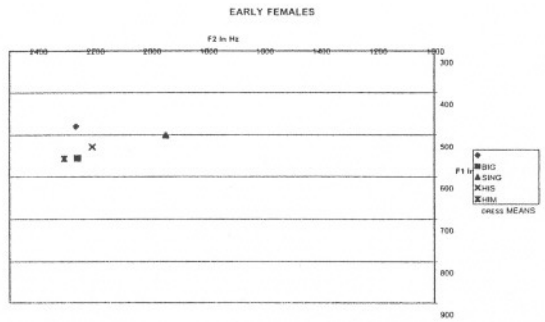
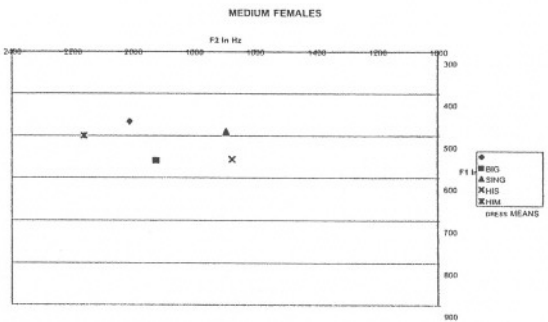


Figure 4: Mean formant frequency values of the KIT-vowel in four phonemic environments and the overall means for DRESS in the speech of J.M., an Early Male.

However, this system did not turn out to be a stable one and KIT-centralisation wins out in the speech of the latest Intermediate Speakers. Figure 5 and 6 show the movement of the KIT-vowel before velars, voiced alveolar fricatives and labial nasals in relation to the DRESS-means for each of the age groups in the Intermediate Period.

[5] These classes (i.e. the KIT tokens before /m/, /z/, /g/ and /ŋ/) turned out to be the most 'extreme' ones (cf. footnote 3 for the environments and their respective cover-terms), in that HIM and HIS show rather central realisations in the speech of all speakers in the sample, whereas BIG and SING appear to have been the environments that promoted raising/fronting of KIT before finally moving over to the central position in the speech of the later speakers in the Intermediate Period.





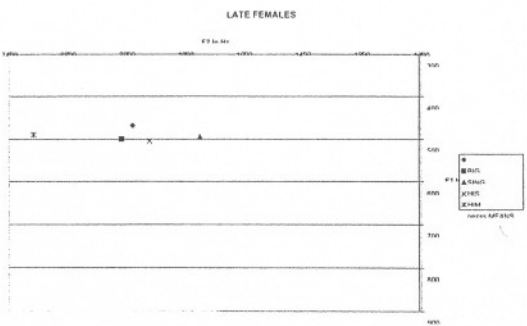


Figure 5: The movement of the KIT-vowel before four phonemic environments in the speech of the female speakers.

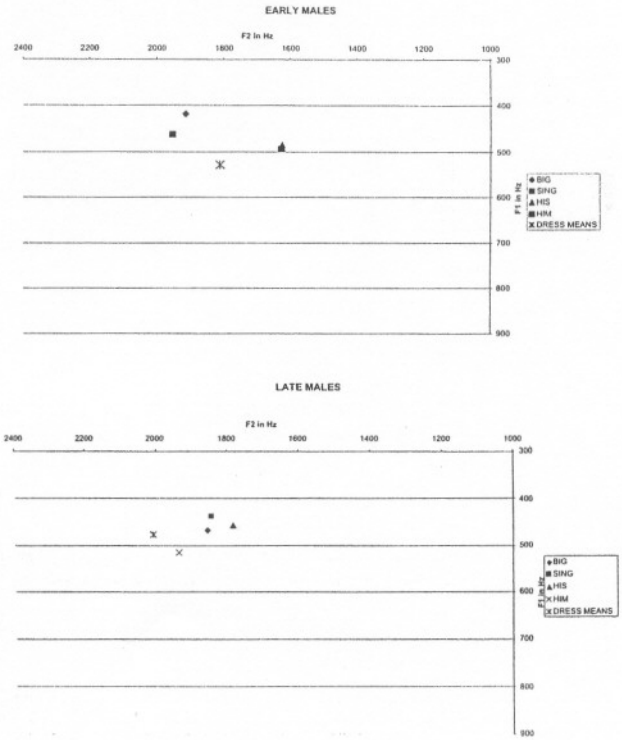


Figure 6: The movement of the KIT-vowel in four phonemic environments in the speech of the male speakers.

It should be pointed out that this division of the KIT-vowel cannot be explained purely in terms of formant transitions, i.e. as a result of co-articulatory mechanisms whereby following velars project higher F2 values onto the preceding nucleus. Although this might play some role in the behaviour of the KIT-vowel with respect to the phonemic environment in which it occurs, the realisation of KIT in the speech of the later speakers does not show such a clear-cut division. That is, for speakers who have the modern system, the pre-nasal/pre-alveolar environments are not necessarily the most central ones, and the pre-velars are much closer to (although still in front of) the KIT-means. Fig.7 below shows the distribution of the mean values for KIT in the speech of Mrs B., a late speaker, who actually has a realisation of SING further back than the KIT means, as well as a forward realisation of HIM, which strongly suggests that the rather rigid allophonic division in the KIT vowel described above does not hold anymore in the speech of some later speakers.

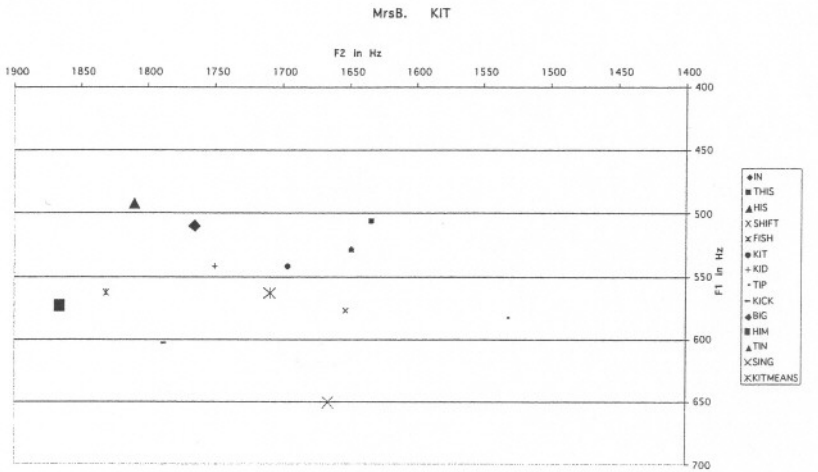


Figure 7: The KIT-vowel in the speech of Mrs.B. (late female).

But it is certainly the environment before velar nasals which is most resistant to centralisation, as some speakers have all their KIT-items centralised, with the exception of SING. Figure 8 is a vowel plot showing the formant frequency values of all the SFVs in the speech of R.W., a medium male speaker who has centralised realisations of all his KIT vowels except those that occur in front of a velar nasal.

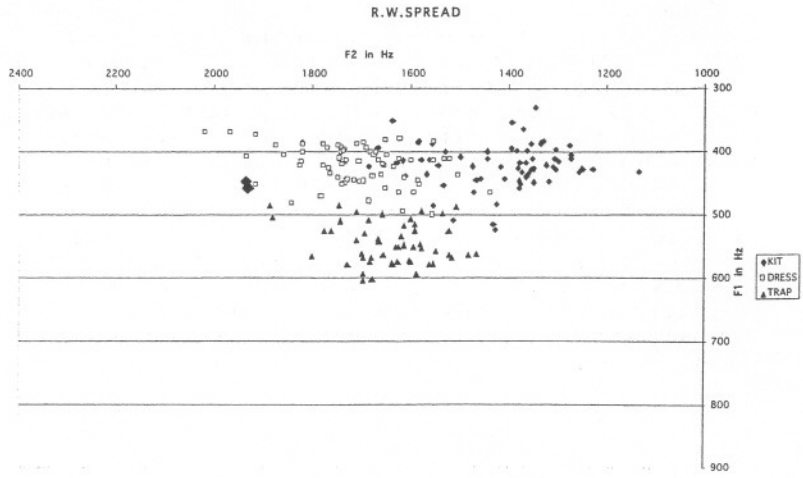


Figure 8: Scatterplot of all tokens of KIT, DRESS *and* TRAP *in the speech of R.W. (medium male). Tokens of the type* SING *are enlarged.*

DRESS-raising and the avoidance of homonymic clash

The data showed a good degree of overlap between KIT and DRESS for some speakers. However, merger is avoided by keeping the two lexical sets apart in one and the same environment. That is, those environments that follow the raised and fronted variants of DRESS lag behind in moving over to the central position for KIT.

The following two figures plot B.G.'s (medium male) KIT and DRESS vowels; the top display in Figure 9 shows the distribution of all tokens while the lower display shows the mean values of the respective subclasses.

It should be clear that both processes, KIT-centralisation and DRESS-fronting/raising are quite sensitive to phonemic conditioning.

Developments in the TRAP vowel

Unlike DRESS/KIT, the behaviour of TRAP is much less clear within the Intermediate Period. Although late speakers tend to show lower F1 values for TRAP (indicating raised realisations), the process is less unidirectional, i.e. individual late speakers may have rather low realisations of TRAP. What follows from this is that a given speaker's 'innovativeness' cannot be deduced from their realisation of TRAP, whereas KIT-centralisation and DRESS-fronting/raising are a reliable indicator of 'innovativeness'. Figure 10 below shows SFV plots of two female speakers, Mrs V.H. (early) and P.H. (late). Whereas P.H. shows the characteristic modern set-up with DRESS in front of KIT, V.H. is more conservative and has a good degree of overlap between KIT and DRESS. However, both speakers have roughly similar realisations of TRAP.

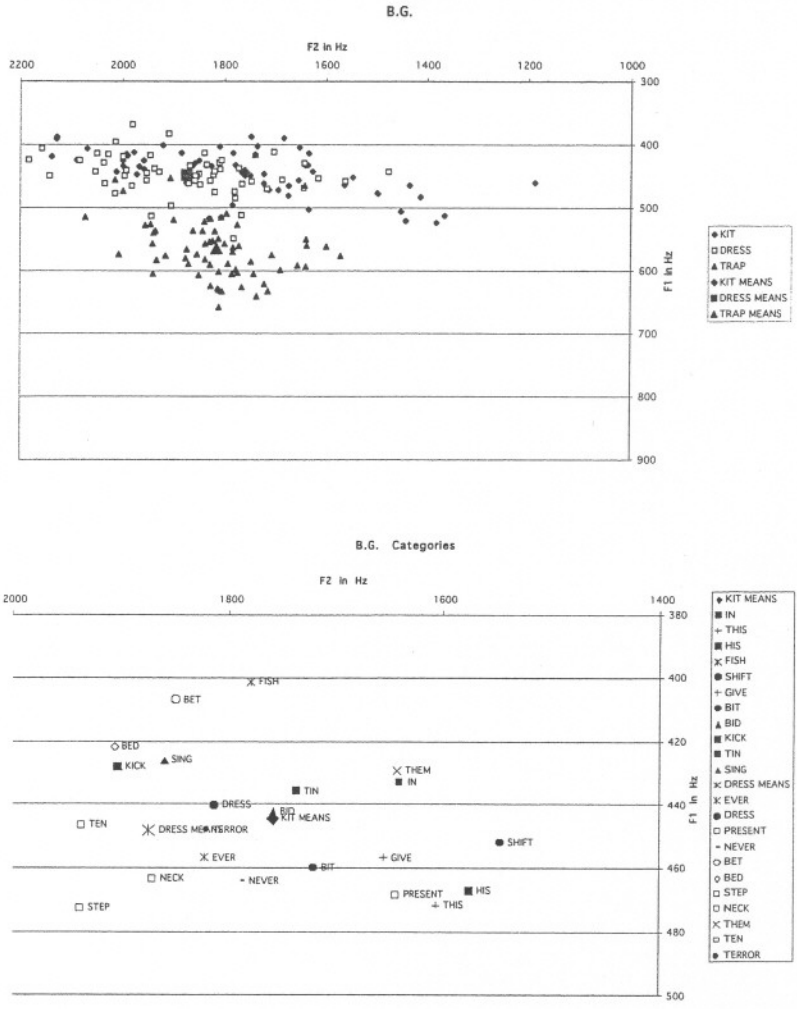


Figure 9: Top: Scatterplot of all tokens of KIT, DRESS *and* TRAP *in the speech of B.G. Bottom: Mean formant frequency values for some phonemic categories in the speech of B.G.*

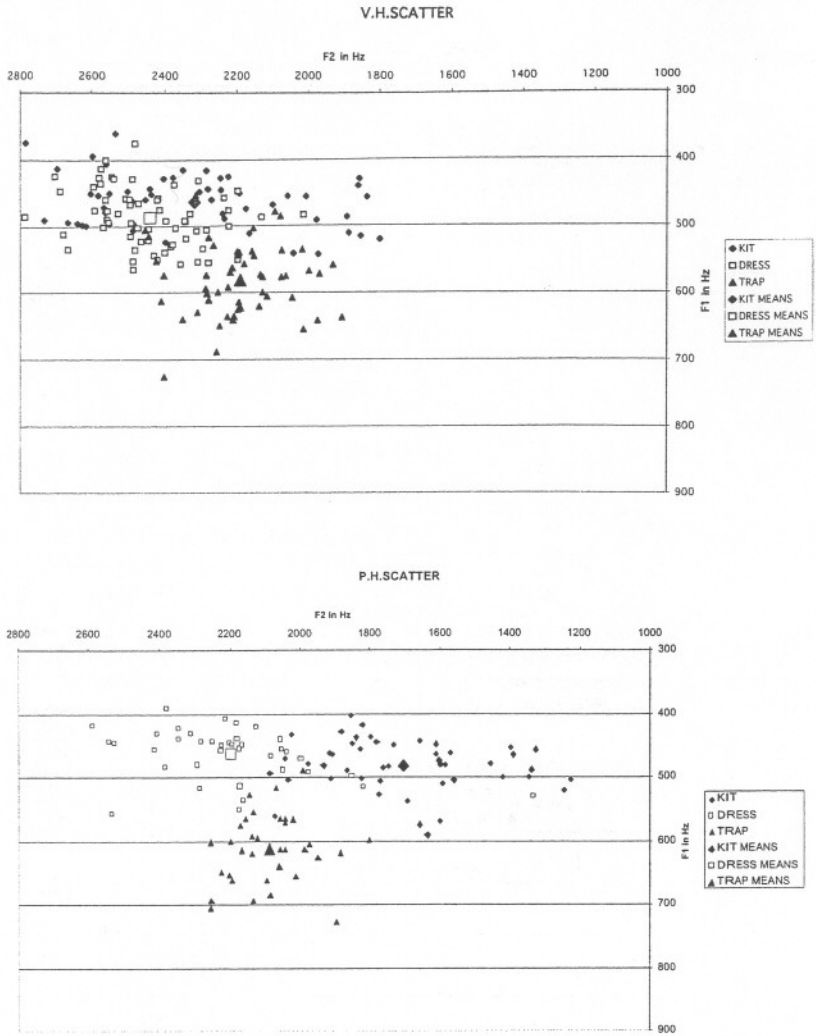


Figure 10: Scatterplots and mean values for KIT, DRESS *and* TRAP *in the speech of V.H. and P.H.*

Conclusions & Caveats

Early Intermediate speakers seem to go through a 'split system' in their realisation of the KIT vowel whereby centralisation and fronting both serve as possible 'ways out' in order to escape phonemic merger with raised/fronted DRESS. For later speakers, the centralised variant becomes the general

realisation. Whereas the movement of each etymological category as a whole looks gradual, both developments are highly sensitive to their phonemic environment. For one and the same phonemic subcategory (i.e. KIT/DRESS before the same environment), the shifting seems to come about in a rather saltatory fashion.

Although later speakers tend to have higher realisations of TRAP, the degree of between-speaker variation is more noticeable within one and the same age-group than for KIT and DRESS. Therefore, TRAP-raising is a far less powerful predictor of 'innovativeness'. This leads to the following conclusions:

- There is a clear push-chain relationship between DRESS and KIT, i.e. DRESS raising/fronting is the initiator of the change in the top two heights. This follows from the fact that KIT-centralisation occurs both later and less uniformly than the raising of DRESS, and substantiates claims regarding the innovative nature of the short front vowels in NZE 'vis-à-vis English English' (cf. Trudgill, Gordon and Lewis 1998, who cite Bauer (1979, 1992) as the main proponent of assuming innovation in NZE, whereas Trudgill (1986) points to the possibility that the closed realisations of DRESS/TRAP might have been inherited from British varieties).

- The behaviour of TRAP is slightly more obscure, in that raised as well as comparatively low realisations are found across the entire corpus. This is in accordance with Bauer's (1986) remarks on the wide range in TRAP-height even in current NZE. Interestingly, this leaves us with the possibility to account for the entire Southern Hemisphere SFV shift in terms of DRESS-raising only, the other developments then fall in line. That is, KIT is pushed out and TRAP is re-arranged around a new (and successively higher) mean in articulatory space.

However, it should be pointed out that the results presented above are rather preliminary and further research is required. The formant frequency values are not normalised, which means that possible differences in vocal tract size between individuals have not been taken into account yet. Furthermore, it is not quite clear up to this point whether what I called the 'fronted' KIT items (i.e. those that occur in front of velars) in the speech of the early speakers are indeed fronted (as the auditory impression suggests), or whether they are merely stuck (i.e. non-backed) in place and move over to the central position after the other subcategories have become stabilised in that area.

Further Research

The next step in the analysis of the SFVs in Intermediate New Zealand English will be to look at the relations between the different phonemic environments and their mutual interrelationship in more detail in order to obtain a better understanding of the mechanisms of the chain shift between the top two vowel heights and see whether the 'chaining' relationship is between the etymological categories of KIT and DRESS as a whole, or rather between phonemic subcategories. Other factors that might have an influence on the behaviour of the SFVs are currently being analysed, such as coda structure and stress. In addition, phonemic environments will be analysed in

more detail, as it is not totally clear at the moment which articulatory factors play the most important role in the chain shift.

Furthermore, external factors such as the speakers' social background will be analysed in more detail.

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