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VARIATION IN THE PRONUNCIATION OF ENGLISH BY NEW ZEALAND SCHOOL CHILDREN

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Abstract

This thesis presents a nationwide survey of selected phonemic and phonetic variables used by New Zealand school children. New Zealand English (NZE) is often described as homogeneous compared to other varieties. However, the discovery of dialect regions for playground vocabulary in New Zealand (Bauer & Bauer 2003) and reports of regional dialects in Australian English justify exploring variation in pronunciation across New Zealand.

The data set for this research is a set of anonymous group interviews from 33 schools around the country. The relatively small amount of data from each location is a primary factor in determining the study's methodology. Tokens from each school are tagged with socio-economic class and ethnicity ratings, based on the characteristics of the school as a whole. Both social and regional factors are considered as potential explanations for the patterns of variation that are revealed. All data sets have variation of some kind, as this was a criterion for including them as part of the research.

The nature of the data set limits the number and type of variables suitable for investigation. The completed research consists of auditory studies of four features and acoustic analyses of two. These are, respectively, non-pre-vocalic /r/, linking /r/, TH-fronting, voicing of the final segment in *with*, FOOT fronting, and FOOT and THOUGHT neutralisation before /l/. The study also includes six small surveys of lexical pronunciations, though these do not contain enough data to contribute to findings about regional and social variation among the young speakers.

Factors affecting the variables' distributions in the data set are complex, and often appear to interact as explanations for the findings. Two variables, non-pre-vocalic /r/ in Otago and Southland and voicing in the final segment of *with*, are best described as regionally variable, while ethnicity is a primary factor in the distributions of three variables: TH-fronting, linking /r/ and non-pre-vocalic /r/ in

the North Island. Socio-economic class appears to influence the distributions of linking /r/ and TH-fronting.

The final discussion explores potential sources for future regional variation in NZE. Social factors such as socio-economic class and Māori and Pasifika populations are unevenly distributed in New Zealand, and are predictable catalysts for potential regional variation in NZE. The statistical analyses presented in this thesis indicate that both these factors contribute to regional differences in the data set. The discussion also considers borrowing, geographic isolation and variables' stigma and prestige as factors in their distributions.

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Chapter 1: Introduction

Many commentators have remarked on the apparent homogeneity of New Zealand English (NZE). As early as 1910, E. W. Andrews (cited in Gordon, Campbell, Hay, Maclagan, Sudbury & Trudgill 2004: 10), a high school teacher, noted that: "[i]n New Zealand the dialect is not a matter of locality and occupation, not even of social position nor education."

Modern accounts of NZE would qualify this statement. Socio-economic class variation is well documented in the variety, and there is also evidence of variation linked to gender and ethnicity. Very few studies, however, have had the opportunity to examine linguistic variation across New Zealand. The dialect's enduring reputation for homogeneity clearly rests on claims of regional uniformity.

Yet social and regional variation cannot be considered in isolation. This thesis sets out to demonstrate that regional variation is closely linked to other social indicators – often these interact in rather complex ways. The aim is to examine the speech of New Zealand school children for emerging and potential regional variation in NZE.

1.1. New Zealand English and its homogeneity

New Zealand English is a colonial variety of English, characterised by its pronunciation, particularly vowel qualities and intonation, and a distinctive vocabulary set. An account of the most remarked upon phonetic features of NZE would include the following: raised short front vowels in the DRESS and TRAP lexical sets[1], a centralised KIT vowel, the near-complete merger of NEAR and SQUARE, fronted GOOSE, a diphthong shift involving FACE, PRICE and CHOICE, and the neutralisation of DRESS and TRAP before /l/ (see e.g. Bauer & Warren 2004). The

[1] This thesis refers to vowel phonemes using the lexical sets devised by Wells (1982). BATH, START and PALM are homophonous in NZE, as are THOUGHT, NORTH and FORCE. I use BATH and THOUGHT as labels for these phonemes.

consonant system is noted for its variable rhoticity, and, like many other varieties, the frequency of vocalised variants of /l/.

Rhoticity aside, NZE researchers usually describe the dialect as regionally homogeneous (see e.g. Hawkins 1973, Wells 1982: 605-6, Bauer 1986). The Origins of New Zealand English Project (ONZE, Gordon et al 2004) used radio recordings of first generation NZE speakers to document the formation of the NZE dialect. They describe modern NZE as "a variety with remarkably little regional variation" (Gordon et al 2004: 79). This is a foundation of their research, whose aim is to identify *how* the apparently uniform variety emerged from its input dialects.

Folklinguistic research, however, suggests that non-linguists disagree with this view. While all accounts single out the non-pre-vocalic /r/ sometimes found in Southland English, Gordon (1997) found that 78 of 97 non-linguists who completed her survey were convinced of distinctive linguistic regions in addition to Southland. The following areas received at least ten identifications (in descending order of frequency): Southland, Auckland, Christchurch, Northland, the North Island's East Coast, Wellington, the South Island's West Coast and Taranaki. Gordon (1997), however, points out that participants in her study mostly describe these perceived dialects using social stereotypes, rather than distinctive language features.

1.2. Australian English and its (lack of) homogeneity

Australian English has also been described as homogeneous until relatively recently (Bradley 2004: 645). In around 1980, however, researchers began to document regional variation in the variety, and, according to Bauer and Bauer (2002a: 171), by that time "differences were already in place". The foremost researcher in this area, David Bradley, describes phonological regional differences in Australian English as "much more subtle than those in the British Isles or North America, but they exist and are continuing to develop" (Bradley 2004: 645). Most of these differences are in vowel realisations. Bradley (2004: 645-51) lists, in particular, alternation between TRAP and BATH in certain lexical items, variation in the onsets of GOOSE and GOAT,

variable quality neutralisation before /l/ and a centralised KIT vowel in New South Wales. He notes that Australian English speakers are increasingly becoming aware of these features.

The development of Australian English is clearly analogous to that of NZE. Both are colonial varieties of English derived from settlers from throughout the British Isles. For both, a relatively fixed standard has emerged from this variability. According to a hypothesis put forward by Bauer and Bauer (2002a) the regional variation attested in Australian English is evidence of a third stage in the development of colonial Englishes. Bauer and Bauer (2002a: 173) describe how regional variation could emerge as the standard is becoming established:

> All the processes which make speakers use language as an in-group identifier lead to a proliferation of varieties of the colonial language, including, eventually, regional varieties.

The key condition proposed for this process is time. Australia was officially settled 52 years earlier than New Zealand, so Australian English could be expected to be further developed than its New Zealand counterpart. It is not clear from the Australian data, however, exactly how this regional variation emerged. Bauer and Bauer (2002a: 173) continue:

> If dialectal divergence has been observed in Australia for at least twenty years, it must have started well before that. We thus estimate that regional variation might begin to be observable in New Zealand about now.

The aim of the present research, as set out below, is to try to capture these early stages of regional dialect formation. This is made difficult by another characteristic of Australian English: forms of variation can be linked in complicated ways. Bradley (1989: 261-2) notes, specifically, that socio-economic class variation in Australian English is regionally variable, and to a greater extent than would be predicted by economic differences between regions. The same sort of interactions could be predicted for NZE. I return to this idea in Section 1.5.

1.3. *New Zealand English and its (lack of) homogeneity*

There is a large body of research on variation in NZE. A detailed review of literature for the specific variables discussed in this thesis is presented in the relevant chapters below. This section briefly describes socio-economic class, gender and ethnicity related variation in NZE, and what is known about regional differences.

Socio-economic class variation is clearly audible in modern NZE. Many of these differences are due to sound changes in progress. Young, non-professionals are more likely to use innovative realisations of a number of phonemes, particularly vowels. This thesis examines realisations of FOOT (Kennedy 2004) and TH-fronting (e.g. Gordon & Maclagan 2004: 48), both of which have been shown to be variable according to socio-economic class in NZE.

Gender variation is often linked to socio-economic class in NZE. As in many other varieties, women's phonetic realisations frequently differ from men's in two directions: women use fewer stigmatised tokens of a variable, but commonly lead sound change towards non-stigmatised forms (e.g. Maclagan, Gordon & Lewis 1999). Gender is not a focus of the present study due to the young age of the participants, but its contribution to variation in the variety as a whole is acknowledged.

Research on ethnic variation in NZE centres around a variety known as 'Māori English'. Most features identified as characteristic of Māori English are present in Pākehā[2] NZE, but to a lesser extent (Warren & Bauer 2004: 614). The variety is considered an ethnic identity marker for its speakers and appears to vary considerably according to setting and interlocutor. Māori English is also attested in the speech of Pākehā from areas with a high Māori population (Bauer & Bauer 2001: 49). Phonetic features attributed to Māori English include non-aspirated voiceless stops and devoicing of word-final voiced fricatives, in addition to a small number of characteristic vowel qualities (Warren & Bauer 2004: 617-8). This thesis examines

[2] New Zealanders of European descent.

linking /r/, whose absence also appears to be a feature of Māori English (Hardman 1997: 78).

There is a small amount of existing evidence for regional variation in NZE. Excepting Bauer and Bauer's research, discussed below, previous studies directly compare speakers from two New Zealand regions. Bartlett (1992, 2002) examines linguistic differences between Southland and general NZE, noting in particular the presence of non-pre-vocalic /r/ and variation between TRAP and BATH in the Southland variety. Bartlett's findings suggest, however, that these distinctive features are decreasing in frequency, excluding rhotic NURSE which appears to function as a salient in-group marker. A second major study compares intonation patterns for speakers of Taranaki and Wellington varieties of English (Ainsworth 2004). There is evidence that Taranaki speakers use more changes of intonational direction than their Wellington counterparts. In addition, Ainsworth found that rural participants are more likely to exhibit regionally marked linguistic features than their urban counterparts. Finally, a small scale honours paper (Kennedy 2004) notes different realisations of the FOOT vowel for NZE speakers from Hamilton and Wellington. Evidence for non-prevocalic /r/ and FOOT movement is examined more closely in the relevant chapters below.

The Language in the Playground Project by Laurie and Winifred Bauer (2000, 2001, 2002a, 2002b, 2002c, 2003) is the most extensive study of NZE regional variation to date. This research, carried out between 1999 and 2001, examined the playground vocabulary reported by year seven and eight (11-12 year old) students from throughout New Zealand. One hundred and fifty schools took part by completing a questionnaire and 33 of these schools agreed to have some of their pupils interviewed two years later. Based on the distribution of a number of vocabulary items, Bauer and Bauer (2003) found statistically significant evidence of three distinct regions in NZE: the Northern Region (reaching as far south as the volcanic plateau), Central Region (including Hawke's Bay down to the South Island cities of Timaru and Queenstown) and Southern Region (Southland and East and South

Otago). Clear markers of these dialect areas are the words used for the chasing game *tiggy, tag* or *tig* (using the Northern, Central and Southern terms respectively).

Bauer and Bauer (2003: 5) also report 11 dialect subregions in NZE, all with significantly different distributions of the vocabulary items. From north to south, these are West Northland, East Northland, Auckland, Central North Island, Hawke's Bay–Wairarapa, Wellington, Nelson–Marlborough, South Island West Coast, Canterbury, Timaru and Central Otago Lakes District, and Southland and East and South Otago.

A number of factors interact with regional variation in Bauer and Bauer's findings. In a 2001 paper, they examine the hypothesis that Māori populations influence New Zealand dialect areas. The Northern Region identified in their research is statistically correlated with reports of terms borrowed from Māori, such as *kia ora,* a greeting, and *pakaru* 'broken', as well as terms previously linked to Māori English, for example a transitive form of *growl,* as in *he growled me* (Bauer & Bauer 2001: 45-8). There are also terms more common in the Northern Region with no previous link to Māori or Māori English: *howz it?* is one example. However, these forms, whether derived from Māori or English, are also associated with low socio-economic class. The Northern Region has a disproportionate number of schools in low socio-economic class communities compared to the rest of the country (Bauer & Bauer 2001: 43), and there is a disproportionate number of students who identify as Māori at such schools (Ministry of Education 1999: 50). The precise direction of influence is difficult to establish empirically, but Bauer and Bauer (2001: 61) maintain that the Māori population in the Northern Region is "one of the most important factors" in separating that region from the rest of the country.

Whether a school is urban or rural has some effect on the patterns of vocabulary it reports (Bauer & Bauer 2003: 59-64). Vocabulary items associated with urban schools notably include Americanisms and TV-influenced terms, but there is much interaction with socio-economic class and region here.

Through a media request, Bauer and Bauer (2002c) were also able to collect evidence that the NZE dialect boundaries they discovered may have been established for many decades. Over 600 readers of *The New Zealand Listener* sent in their *tiggy/tag/tig* equivalents to the researchers, some from school days before 1920. Although, strangely, the terms used by earlier New Zealanders were different, the same dialect boundaries were already in place. It is also interesting to note that Bauer and Bauer (2002c: 41) found no particular link between British terms and the areas where different groups of Britons settled in New Zealand: *tiggy*, in this context, is not even attested in Britain.

1.4. Children and language change

One of the strengths of the present study is that it focuses on the speech of early adolescents. The central role of children and adolescents in language change is highlighted in many recent dialectal studies (e.g. Kerswill & Williams [2000] in Milton Keynes; Gordon et al [2004: 243-4] and Bauer & Bauer [2003: 81-92] in New Zealand). Kerswill and Williams (2000: 67) argue that one reason children lead sound change is psycholinguistic:

> Adults are thought to have passed a "critical period" for language acquisition…, and so are not likely to be able to make major grammatical and phonological changes to their speech…Contrasted with this is the considerable plasticity of children's phonologies and grammars up to, approximately, puberty.

Any of the variations in children's speech that are implied by this description could develop into stable variants as the children mature.

An important social factor promoting dialect formation is the peer groups that develop in early adolescence. Deser (1989) found that vowel formant values for Detroit teenagers were more closely aligned to their peers than to their parents. These findings confirm common-sense ideas about the importance of social groups for young teens. If a 'cool' person randomly chooses a particular variant (from whatever source) it is reasonable to expect at least some of their peers to favour the variant, and for the same reason to disfavour pronunciations used by their parents. Eventually the variant may spread beyond the peer group to other schools in the

area, and then to other towns and cities. Regional dialects form if the chain of social contacts is broken somewhere and the spread of new variants constrained.

1.5. Social factors in regional variation

The process of dialect formation described above for peer groups can also be extended to wider societal constructs. This introduction has so far put forward two examples of social factors interacting with regional linguistic variation: socio-economic class variation in Australia (Bradley 1989) and Māori populations in New Zealand (Bauer & Bauer 2001). This is an idea taken up by Horvath and Horvath (2002) in connection with their data on /l/ vocalisation in Australian and New Zealand English. The researchers argue that evidence of regional variation should be interpreted with reference to both "space", presumably geographical distance, and "place", described by Horvath & Horvath (2002: 336, emphasis in original) as:

> …the particular ensemble of linguistic and social conditioning *within* speech localities, i.e. co-occurring social and linguistic processes found in a speech locality that may promote or inhibit a linguistic change.

Not surprisingly, the three primary social dimensions the researchers consider in this model are socio-economic class, gender and ethnicity. As outlined in the previous sections, all three dimensions are directly relevant to the NZE linguistic situation: there is clear evidence of linguistic variation linked to each.

Horvath and Horvath (2002) do not extend their model beyond change in progress, but it is interesting to do so. One possibility is that social and regional factors both contribute to linguistic variation, with all the complexities that these interactions would promote, and that resulting variation is later reinterpreted by speakers as regional variation. The Southland variety of NZE provides a clear example. The presence of non-pre-vocalic /r/ in Southland is generally attributed to the ethnic make up of Southland in the early decades of European settlement in New Zealand.

We would no longer want to suggest that Southland differed ethnically from other regions, so can only describe its present day distinctiveness as regional variation[3].

1.6. Aim and outline

This chapter has presented a broad range of background literature relevant to this research. There is evidence of regional variation in Australian English. We have a description of NZE as phonetically variable according to gender, socio-economic class and ethnicity, and evidence that the latter two are regionally variable. I have put forward an argument claiming that potential regional variation in NZE is likely to be linked to variation currently attributed to social factors. There is also evidence of established dialect boundaries in NZE vocabulary, and a small amount of documented regional phonetic variation. All of these factors are clear incentives to search for regional accents in modern NZE, particularly in the speech of young people. This section sets out the aim of this research: an initial exploration into potential regional variation in the speech of New Zealand school children.

One reason that regional accents in NZE are not well investigated is that researchers have little idea where to look. Non-linguists' perceptions of regional variation (outside of Southland) rarely hinge on specific features: rate of speech was most commonly given as a distinguishing feature by Gordon's (1997) informants. Two factors were considered when choosing variables for this study: documented variation and ease of analysis.

The key attribute for each variable was that it has documented variation in NZE. It is not particularly important what form this variation takes. Features with documented socio-economic class variation may also be regionally variable; aspects of NZE motivated by ethnicity may be restricted to the area they have been attested in. Without systematic investigation we cannot be sure. But at least if a feature is variable it is interesting to document this variation across the country. If the

[3] The linguistic processes included in Horvath & Horvath's (2002) definition of *place* are probably outside the scope of the research presented here, but would provide an interesting dimension for future study. This is the idea that certain linguistic innovations, which may be regionally or socially conditioned, can create contexts that favour (or disfavour) subsequent changes, thus potentially contributing to dialect divergence.

patterns of variation differ we will have initial indications of regional accents. Conversely, it will be very good evidence of regional homogeneity if new phonetic features are emerging simultaneously across New Zealand.

The choice of variables was also restricted by the available data. The data set for this research was collected before the project began (see the description in Chapter 2). It is interview data, without accompanying wordlists or sentence data, so variables need to be both sufficiently frequent and suitable for analysis in running speech[4]. The following variables are included in the study:

Non-pre-vocalic /r/. This feature is documented in Southland English (Bartlett 1992, 2002) and at low levels in Pasifika[5] Englishes (Starks & Reffell 2005). It is examined auditorily (see Chapter 3).

Linking /r/. Linking /r/ is variable in NZE (Bauer & Warren 2004: 595), though the feature is under-documented[6]. It is also examined auditorily (see Chapter 3).

(th). TH-fronting has documented socio-economic (Campbell & Gordon 1996) and ethnic (Starks & Reffell in prep) variation in NZE. Voicing of the final segment in *with* is also variable, a feature that is regionally distributed in British varieties of English. Auditory analyses are used for these features (see Chapter 4).

Vowel analyses. Regional variation in the quality of the FOOT vowel was documented by Kennedy (2004). There is also evidence of FOOT and THOUGHT neutralisation before /l/ in NZE (Bauer & Warren 2004: 584) and this may be regionally variable (Bauer & Bauer 2002a). These variables are analysed acoustically (see Chapter 5).

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[4] The 'dental s', proposed as a regional feature by Starks (2000), was abandoned when the interview recordings were found to be unsuitable for identifying bands of frication on spectrograms.

[5] This thesis uses *Pasifika* to refer to New Zealanders of Pacific Island descent.

[6] It was initially intended to also examine intrusive /r/, but results from the ONZE project were discouraging. Sudbury and Hay (2005) found just 198 potential environments for intrusive /r/ in their data, against 3,894 for linking /r/.

Selected lexical variants. NZE speakers occasionally pronounce *something, anything, everything* and *nothing* with an epenthetic final /k/, as in [sʌmθɪŋk] (Gordon 1998); some speakers in the corpus for this study use the determiner *a* before a vowel instead of Standard English *an*; and *says* and *either* have alternate pronunciations in NZE. No patterns of variation have been established for any of these features. The contrast between *which/witch* is also examined, though little data is available. These are all features for auditory analysis (see Chapter 6).

Each of these variables is examined individually in the data set for signs of regional and social variation. The aim is to treat hypotheses about regional variation in the same way as socio-economic class and ethnicity data. If region is statistically a better explanation of variables' distributions in the data set than the latter factors, then this is evidence of regional variation.

Chapter 2: Methodology

The data set for this project is taken from interviews carried out by Laurie Bauer for the Language in the Playground Project (Bauer & Bauer 2003) in October and November 2001. The interviews were designed to elicit vocabulary items for that study, so do not conform to the usual models for dialectal research. This chapter describes the data and sets out the general processes used in analyses.

2.1. Participants

The participants in this study are year seven to eight (11-12 year old) New Zealand school students. This age group was chosen because it was thought that the students would be sufficiently mature to reflect on their playground activities, but not so removed that they would have forgotten the relevant words, rhymes and games. A focus on adolescent speakers is a particular strength of the study. As noted above, adolescents are thought to have a leading role in new dialect formation. Twelve years of age is also old enough to exclude speech motor-development issues as a consideration, particularly for <th> sounds (Margaret Maclagan p.c.).

The students in the recordings are not individually identified as a condition of the ethical approval for the vocabulary study. This means that gender cannot be included as a social variable for the present research. (Voice pitch is not a good indicator for speakers in this age group. There were a number of occasions during transcription when I had assumed a participant's gender, only for this to be disproved later in the conversation.) In effect, the anonymity of the recordings means that it is necessary to group together all available data from a school.

The effect of conflating each school's data is mitigated by research into the speech of adolescent peer groups (as described in Section 1.4). I do not wish to argue that combined data sets provide the ideal source for this sort of research (the transcription process alone is somewhat more challenging), but only that this

should detract less from a project involving younger speakers than it might for adults. The amount of data available from each speaker and school is also a consideration; this is discussed in more detail below.

Unsurprisingly then, background data about the participants is based solely on the schools they attend. Four dimensions are considered: location, socio-economic class, ethnicity and whether the school is rural or urban. Socio-economic class and ethnicity are collectively termed 'social variables' in the discussion that follows.

2.1.1. Location

Thirty-three schools agreed to take part in this research. These are dotted throughout the country (for an overview see Map 1). An effort was made to include at least two schools from each of the 11 sub-regions identified in the vocabulary study, as well as a balance of deciles and rural/urban schools (Bauer & Bauer 2002b: 10/1, see below). The researchers were also constrained, of course, by those schools willing to take part in the project. The 33 schools finally included are relatively well distributed, with a slight concentration in the central North Island. Generally the North Island is more thoroughly surveyed than the South, but it is also more densely populated.

2.1.2. Socio-economic background

Socio-economic information for each school is taken from its decile rating. This is a rating from one to ten (ten being the highest) assigned to all schools in New Zealand by the Ministry of Education for funding purposes. A school's decile rating takes into account the income and education of the community from which the school draws its roll, based on census information (Ministry of Education 2005). Obviously this figure is only indicative of the socio-economic class of the particular students taking part in the interviews. Participating schools are grouped as high (8-10), middle (4-7) and low (1-3) decile to reflect this inexactness (see Table 2.1).

2.1.3. Ethnicity

Ethnicity data, too, are taken from Ministry of Education documents: in this case Education Review Office reports written within two years of the 2001 interviews (Education Review Office 2006). The percentage of Māori students was chosen as a useful indicator (see Table 2.1, Map 2). This makes it possible to contribute to research on Māori English. It was also felt that relatively small immigrant populations were more likely to align themselves with the dominant social group, in this case Pākehā. For example, it is likely that students from a Christchurch school with 72 percent Pākehā, eight percent Māori and 20 percent other ethnicities would use fewer Māori-influenced speech features than students from a Whangarei school with the same Pākehā population and 28 percent Māori students. (An exception is the South Auckland school with a majority of Pacific Island students. This school is kept separate in the relevant analyses below.) Assigning a single ethnicity figure to a school again appeals to arguments about the strong influence of peers on adolescents' linguistic choices: it assumes that Pākehā students in strongly Māori areas are likely to share dialect features usually attributed to their Māori classmates. Three schools have very high numbers of Māori students: School 2 (Kaikohe) has 92 percent Māori students, School 1 (Kaitaia) 83 percent Māori, and School 14 (Northern Hawke's Bay) 79 percent Māori. All other schools have two to 52 percent Māori students, a minority in all but one location.

Establishing the relative effects of ethnicity and socio-economic class in this data is challenging. Ordering the 33 schools by percentage Māori students is not dissimilar to ordering them by decile rating: the two are highly correlated. I will address this issue with caution in the analyses below. It should also be noted that those schools with the greatest number of Māori students are concentrated in the northern half of the North Island (see Map 2).

School number	General Location	Island	Main region	Subregion	Decile	Percentage Māori students	Rural/Urban	Transcript wordcount
1	Kaitaia	North	Northern	West Northland	Low	83	Rural	1412
2	Kaikohe	North	Northern	West Northland	Low	92	Rural	1426
3	Whangarei	North	Northern	East Northland	Low	35	Urban	3444
4	Rural Northland	North	Northern	East Northland	High	29	Rural	4325
5	Helensville	North	Northern	Auckland	Middle	25	Rural	2525
6	Auckland	North	Northern	Auckland	High	2	Urban	3245
7	South Auckland	North	Northern	Auckland	Low	Pasifika	Urban	1576
8	Hauraki Plains	North	Northern	Central North Island	Low	47	Rural	1613
9	Tauranga	North	Northern	Central North Island	High	4	Rural	2212
10	Hamilton	North	Northern	Central North Island	High	8	Urban	3131
11	Rotorua	North	Northern	Central North Island	Middle	38	Urban	4072
12	Te Kuiti	North	Northern	Central North Island	Low	52	Rural	1317
13	East Cape	North	Northern	Central North Island	Low	34	Rural	1450
14	Northern Hawke's Bay	North	Central	Hawke's Bay-Wairarapa	Low	79	Rural	3197
15	New Plymouth	North	Northern	Central North Island	Middle	25	Urban	3897
16	Hastings	North	Central	Hawke's Bay-Wairarapa	Middle	15	Urban	2725
17	Rangitikei Plains	North	Central	Wellington	High	7	Rural	4636
18	Dannevirke	North	Central	Hawke's Bay-Wairarapa	Middle	27	Rural	1364
19	Lower Hutt	North	Central	Wellington	Low	23	Urban	2625
20	Wellington	North	Central	Wellington	High	6	Urban	5165

Table 2.1: Total data set (continued next page).

School number	General Location	Island	Main region	Subregion	Decile	Percentage Māori students	Rural/Urban	Transcript wordcount
21	Picton	South	Central	Nelson-Marlborough	Low	37	Rural	2910
22	Nelson	South	Central	Nelson-Marlborough	High	5	Rural	4059
23	Westport	South	Central	South Island West Coast	Middle	11	Rural	1141
24	Greymouth	South	Central	South Island West Coast	Middle	7	Rural	3339
25	North Canterbury	South	Central	Christchurch and most of Canterbury	Middle	12	Rural	2029
26	East Christchurch	South	Central	Christchurch and most of Canterbury	Low	11	Urban	1477
27	Central Christchurch	South	Central	Christchurch and most of Canterbury	High	4	Urban	1605
28	Timaru	South	Central	Timaru and Central Otago Lakes District	Middle	5	Urban	1926
29	Queenstown	South	Central	Timaru and Central Otago Lakes District	High	9	Rural	3424
30	Maniototo	South	Southern	Southland and East and South Otago	Middle	17	Rural	2111
31	Dunedin	South	Southern	Southland and East and South Otago	High	3	Urban	2641
32	Gore	South	Southern	Southland and East and South Otago	Middle	10	Rural	2300
33	Rural Southland	South	Southern	Southland and East and South Otago	Low	19	Rural	1010
					Total			85329

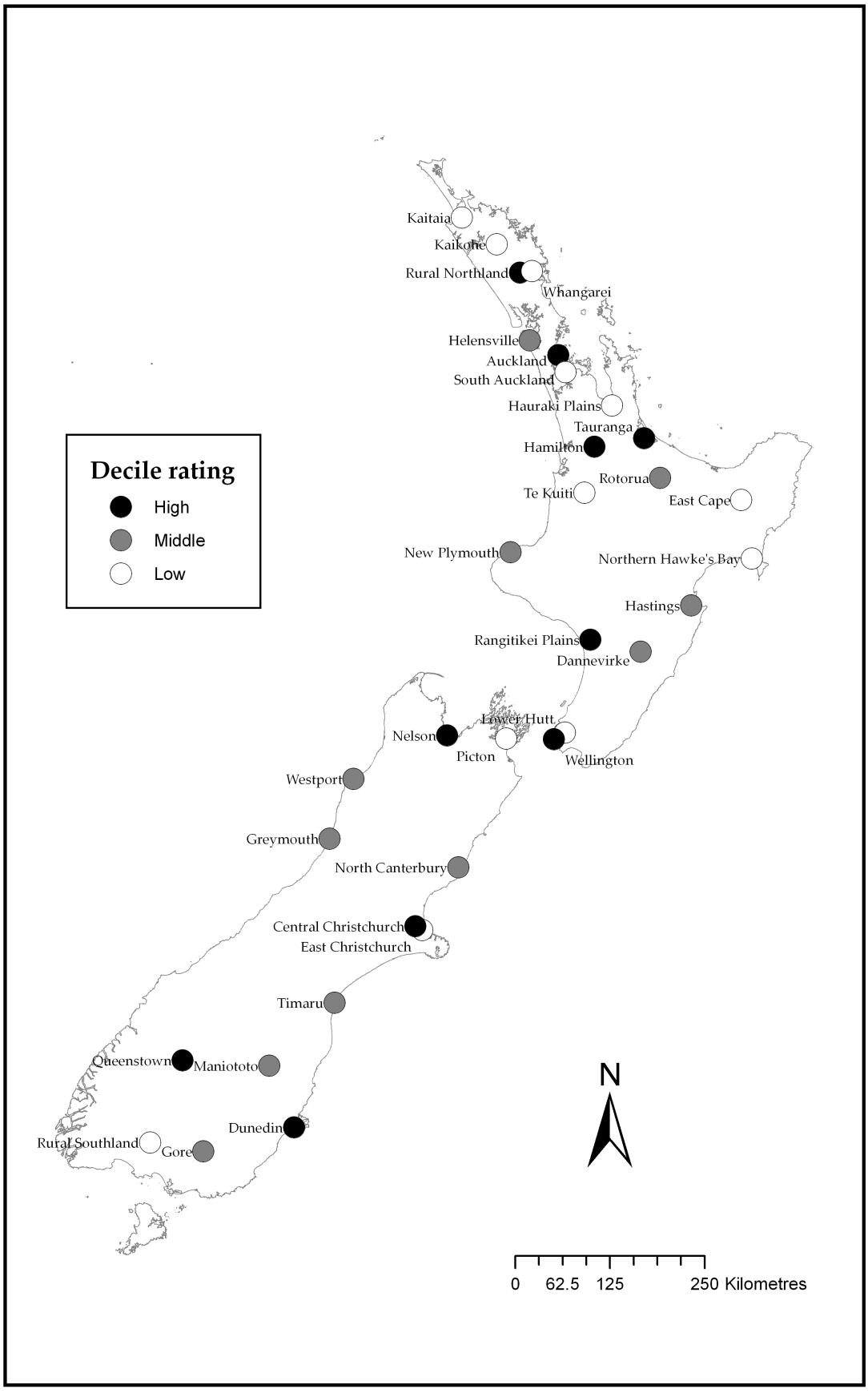
Table 2.1 (continued): Total data set.

2.1.4. Rural and urban schools

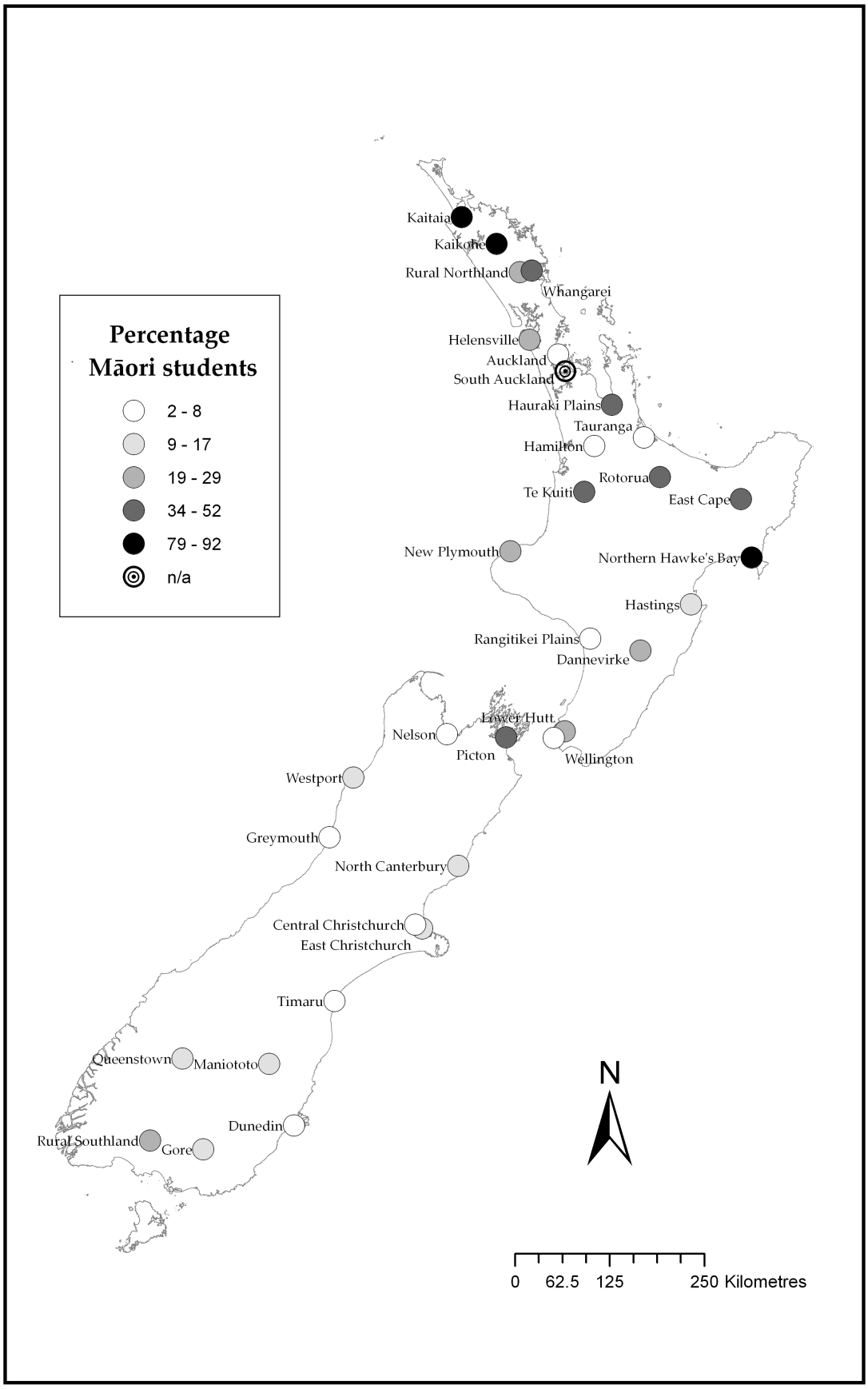
The criteria for labelling each school as rural or urban are adopted from Bauer and Bauer (2003). Schools are labelled urban if they are one of four or more within a 30 by 37 kilometre grid on a map of New Zealand. Thirteen of the schools taking part in this study are urban schools; 20 are rural (see Table 2.1). It was not expected that this binary opposition would produce particularly interesting results in itself, but the distinction was retained to allow the effects described in the vocabulary study (see Section 1.3 above) to be explored.

2.1.5. 'Local' students

Only students who had lived in their region since the age of seven were included in the data set for this research: at least four to five years. This age is earlier than other New Zealand English databases to account for the young speakers involved. In many cases the interviewer directly asks the participants how long they have been in the area. There appears to be a certain prestige in coming from elsewhere and most quickly respond with their travel histories. ("I was born in [location] but lived here once I got home from the hospital" is an extreme, but not unique, example of this!) Where students have not been asked directly, this information often emerges during the course of the discussion. Frequently there is a disagreement over a particular word or game which is explained by one student's schooling elsewhere. Conversations about shared games in early primary school are also taken as evidence that the participants are local. If none of these details are available then the transcript is omitted; this only happened on a handful of occasions.



Map 1: Locations of participating schools and their decile ratings.



Map 2: Location of schools with high numbers of Māori students.

2.2. *Data*

The participants are recorded taking part in group interviews with Laurie Bauer. Bauer is a speaker of British English: it is possible that participants accommodate towards his speech during the interviews, but this is at least consistent for all. Each group averages three to five students[7], and most are made up of natural friendship groups selected by the students. The resulting interviews are generally rather informal (there are speech samples on the accompanying CD).

2.2.1. Amount of data

The amount of data from each school varies considerably. At some schools, just a single interview is available (usually this is rather long); other schools have up to 15 recordings. The interviews in each school generally last an hour, corresponding to a half-day visit from the interviewer.

The most useful comparison, however, is the number of words uttered by students at each school. This takes into account that some interviews have very little participation from students and others have extensive monologues. The total number of words from each school ranges from 1010 words from School 33 (Rural Southland) to 5165 words for School 20 (Wellington). The figures for all schools are recorded in Table 2.1.

2.2.2. Transcription processes

Only utterances from local participants were transcribed. Non-local students were identified by a short speech sample which was compared to all other utterances in a transcript. Any potentially matching speech was removed from the transcript. This means that all data in a transcript is suitable for analysis.

Utterances were only transcribed if they were likely to contain relevant information: *nup, I dunno* and *um* were left out, for example. Very long monologues were often not completely transcribed to prevent one speaker completely dominating a school's data set.

[7] Two smaller schools chose to have an entire class group interviewed together.

2.3. *Analysis*

2.3.1. Phonetic/phonemic analysis

The data were analysed using ONZEminer (Gordon, Maclagan & Hay forthcoming), a program that provides an interface between Transcriber (Manta, Antoine, Galliano & Barras 1998-2006) and the acoustic phonetics program Praat (Boersma & Weenink 2005). Both acoustic and auditory techniques were used. These are described for each variable in the chapters below.

2.3.2. Statistical analysis

This section describes statistical analyses for binary variables in the study. Separate processes for measured variables are set out in the relevant chapter below.

A single measure of each variable for each school was obtained by averaging the proportion of realisations of each variant across all interview transcripts[8] from a school. This process is designed to minimise any effects from dominant speakers in a school's data set: all transcripts, regardless of length, have equal weight in the calculation. This figure is presented on a map of New Zealand as a general indication of each variable's distribution.

More detailed findings are obtained using Classification and Regression Tree (CART) analyses (Mendoza-Denton, Hay & Jannedy 2003). There are two types of CART analysis presented in this research. The first groups together schools with similar distributions of a variable. Groupings obtained in this way are only retained where they contain neighbouring schools; an explanation other than region is required to explain geographically distant similarities. This analysis is only performed for variables where every school's data set contains at least ten tokens.

The relative effects of social, regional and linguistic factors are explored in a separate CART analysis for each variable. Three potential regional factors are adopted from Bauer and Bauer's (2003) findings: North Island versus South Island (labelled as 'island'); Northern, Central and Southern Regions (labelled 'main

[8] Individual speakers are identified for non-pre-vocalic /r/ (see Section 3.1.2).

region'); and the researchers' 11 subregions. The model includes the three decile groupings presented above to represent socio-economic class, and the percentage of Māori students at each school representing ethnicity. Region and socio-economic class data are entered as discrete factors, while ethnicity information is classed as an integer. This means that ethnicity results are presented as less than or greater than a certain percentage. The CART analysis also includes as many relevant linguistic factors as possible. This is again a consequence of mismatched data: it aims to prevent misleading results from school data sets with greater or fewer examples of linguistic contexts that favour a particular variant.

CART analyses were carried out using the statistics program R (open source). All factors appearing in the CART analyses reach significance level, as determined by the R code.

2.3.3. Map presentations

Maps were created using ArcGIS 9: ArcMap Version 9.1. (ESRI 2005). All maps record a separate result for each school, even where the differences between these results are not statistically significant. For this reason, maps should be regarded as visual aids only.

The maps present findings for each variable in five groups using the 'natural breaks' function in ArcMap. This function divides the data into natural clusters and places breaks between the clusters. It is a useful way to represent meaningful variation in the data set, while still keeping the maps relatively simple to interpret. Note, however, that the scale of variation differs considerably between maps. They should always be read with reference to the figures displayed in the legend.

2.3.4. Sound files

The accompanying CD contains examples (in .wav format) of all of the variables discussed in this research, taken from across the data set. The sound files also provide an insight into the nature of the recordings.

Chapter 3: /r/ variables

3.1. Non-pre-vocalic /r/

3.1.1. Literature review

Non-pre-vocalic /r/ is an established regional variable in NZE. The term non-pre-vocalic /r/ refers to an /r/ which is pronounced after a vowel and before a consonant or a pause. Speakers are described as *rhotic* if their speech contains non-pre-vocalic /r/. Many speakers from Southland use a (partially) rhotic variety of English (Bartlett 1992, 2002), a feature which is generally attributed to the high number of Scottish immigrants who settled in the province (Gordon et al 2004: 175). The NZE spoken outside of Southland is usually described as non-rhotic. Two more recent studies have found evidence of non-pre-vocalic /r/ in specific communities: Pasifika school children in Auckland (Starks & Reffell 2005) and the variety of English used in recordings by Samoan New Zealand hip hop musicians (Gibson 2005).

Non-pre-vocalic /r/ in Southland English has been extensively documented in a doctoral thesis by Chris Bartlett (2002). Bartlett's data revealed change in two directions. Both the consonantal variant of /r/ and rhotic unstressed lettER vowel are gradually disappearing in the speech of younger speakers in his study, but a rhotic NURSE vowel appears to be undergoing "a striking resurgence" (Bartlett 2002: 142). Young, urban males have particularly high levels of NURSE rhoticity in his data, with four out of six males aged 15-20 using the variant in over 85 percent of relevant items (Bartlett 2002: 89). Bartlett suggests that the feature has become an identity marker for young Southland speakers.

In the opposite end of the country, Starks and Reffell (2005: 41) have found low levels of non-pre-vocalic /r/ (3.6% across all speakers) in read data from 40 young Māori and Pasifika students in South Auckland. In contrast to the Southlanders described above, speakers recorded by Starks and Reffell did not favour any

particular vowel context for /r/ realisation. This can be qualified by two comments. Firstly, it is significant that the data was read aloud by the participants. Written <r>s could promote rhotic pronunciations uncharacteristic of a speaker, especially for less confident readers. (The authors note that reading competence was an issue for them in data collection (Starks & Reffell 2005: 39), so this is a relevant consideration.) Secondly, the reading material for participants did not contain particularly representative contexts for /r/ following NURSE: *were* and *ArthUR* are the two items listed by the researchers (Starks & Reffell 2005: 43). These items are unlikely to have stressed vowels in running speech; if they were stressed by speakers this is further evidence of reading effects. Nevertheless, this study is significant as the only report of non-pre-vocalic /r/ in modern NZE speech outside Southland.

Another recent study has looked at the presence of non-pre-vocalic /r/ in New Zealand hip hop recordings. Gibson (2005) examined three albums from New Zealand-born Samoan performers and found high levels (94% across all speakers) of rhotic NURSE and a very small number of realisations in other contexts. This distribution is similar to that reported for young Southlanders, but, as Gibson (2005: 7) points out, "there is very little contact between Southland and the hip hop scene, and it can be safely assumed that the rhoticity in hip hop pronunciation is not related to that found in Southland."

The model accent for performers in Gibson's study is more likely to be American as this is where hip hop originated. Gibson (2005: 10) could find no quantitative studies of hip hop accents specifically. There do, however, appear to be a number of reported cases where NURSE rhoticity alone has been retained or adopted in a variety. Wells (1982: 221) is regularly cited in this context: "many Americans whose speech is otherwise non-rhotic retain (or reacquire) /r/ in NURSE and perhaps also in weak syllables (the lettER words)." He provides no further information about where and who such speakers are.

Wolfram and Thomas (2002: 141) also separate three phonetic contexts in their analysis of African American Vernacular English /r/ vocalisation, using what they

call the "traditional delimitation". Their classification separates rhotic NURSE (or /r/ in nuclear stress position) and rhotic lettER (/r/ in unstressed nuclear syllable position) from syllable coda word-stressed examples such as *car* or *port.* This suggests a belief that /r/ realisations can behave differently in each of these contexts, but their data only show a strong effect for stressed versus unstressed position, i.e. the NURSE context is not significantly different from other stressed examples.

Bailey and Thomas (1998: 91), however, use the same coding system to present evidence from five European American females born between 1890 and 1970 in South Alabama. The older speakers in their data exhibit /r/ realisation in NURSE alone, while younger speakers use the variant in NURSE and other stressed syllable coda contexts, and the youngest speakers use it in all contexts. Clearly there is a precedent for non-pre-vocalic /r/ appearing in NURSE and not elsewhere, but we lack evidence that this occurs in a variety that would obviously be influential for New Zealand hip hop artists.

Bartlett (2002: 142) appeals to articulatory arguments to explain a preference for /r/ in the context of NURSE. He claims that in most contexts /r/ must be realised as a separate consonant, but for NURSE the vowel itself can be rhotacised. This claim does not appear to be borne out by further research. Ladefoged and Maddieson (1996: 313) present evidence to suggest that all vowels can be rhotacised. Some speakers of Badaga, a Dravidian language, even have two phonological levels of rhotacisation applied to their five vowel qualities (Ladefoged & Maddieson 1996: 313).

Bartlett's (2002: 142) suggestion that a preference for NURSE is articulatorily motivated must again appeal to an American English model. Phonological systems of General American English (e.g. Wise 1958: 119, Kenyon & Knott 1953: xvii) include two rhotic vowels: [ɝ] and its unstressed counterpart [ɚ] (NURSE and lettER in Wells' [1982] system). Therefore, if NZE speakers favour rhotic vowels over sequences of vowel + /r/, the American model would predict NURSE as a likely context, though this does not explain why rhotic lettER is not similarly favoured. (And the same question can be put forward about Bailey and Thomas' (1998) results

cited above, which also show speakers rhotacising NURSE and not letter.) I return to the question of American English influence on NZE in Section 7.6.1.

3.1.2. Methodology

Potential tokens of non-pre-vocalic /r/ were identified using the orthographic search function in ONZEminer. This method found all utterances with instances of pre-consonantal and pre-pausal <r> in the interview transcripts.

There were two changes to this procedure as patterns began to emerge from the data. Firstly, it was decided to separate individual speakers in the group interviews. This is a consequence of notable variation among students at each school. A student at one of the first schools analysed (School 3, Whangarei) had six realised tokens of /r/ after NURSE, unlike any of his classmates. As a contrast, seven of eight students from Rural Southland (School 33) had at least one instance of non-pre-vocalic /r/, but a relatively small total of just 21 tokens overall.

After analysing a third of the data set (11 schools; this the pilot data set in Table 0.1, Appendix A), it became clear that every token of non-pre-vocalic /r/ so far identified was in the context of NURSE. Continuing to analyse all contexts looked to be a lengthy and largely unproductive process. For remaining schools, I decided to systematically analyse all potential /r/s following NURSE, and then to examine other contexts in a school's data set only if evidence of rhoticity was found.

Non-pre-vocalic /r/ tokens were analysed auditorily. The classification was binary: any perceived consonantal /r/ or /r/-coloured vowel was coded in the /r/ category. I analysed each potential /r/ token blind on two occasions and a token was only retained if these analyses agreed.

The map presentation for non-pre-vocalic /r/ is based on the mean realisations of rhotic NURSE across all speakers at a school. This means that the figures presented on Map 3 more accurately represent variation between speakers at each school than is the case for other variables in this study. (Maps for other variables show mean realisations across all transcripts from a school, as described in Section 2.3.2.) The

two statistical models presented below are also restricted to tokens following NURSE. The first defines presence or absence of /r/ as a fixed variable and location as a dependent variable. The second includes all potential social and regional factors listed in Section 2.3.2.

The total data set for non-pre-vocalic /r/ consists of 3358 tokens, while the data set for /r/ following NURSE is made up of 1543 tokens, with between 25 and 84 from each school (see Table 0.2, Appendix A).

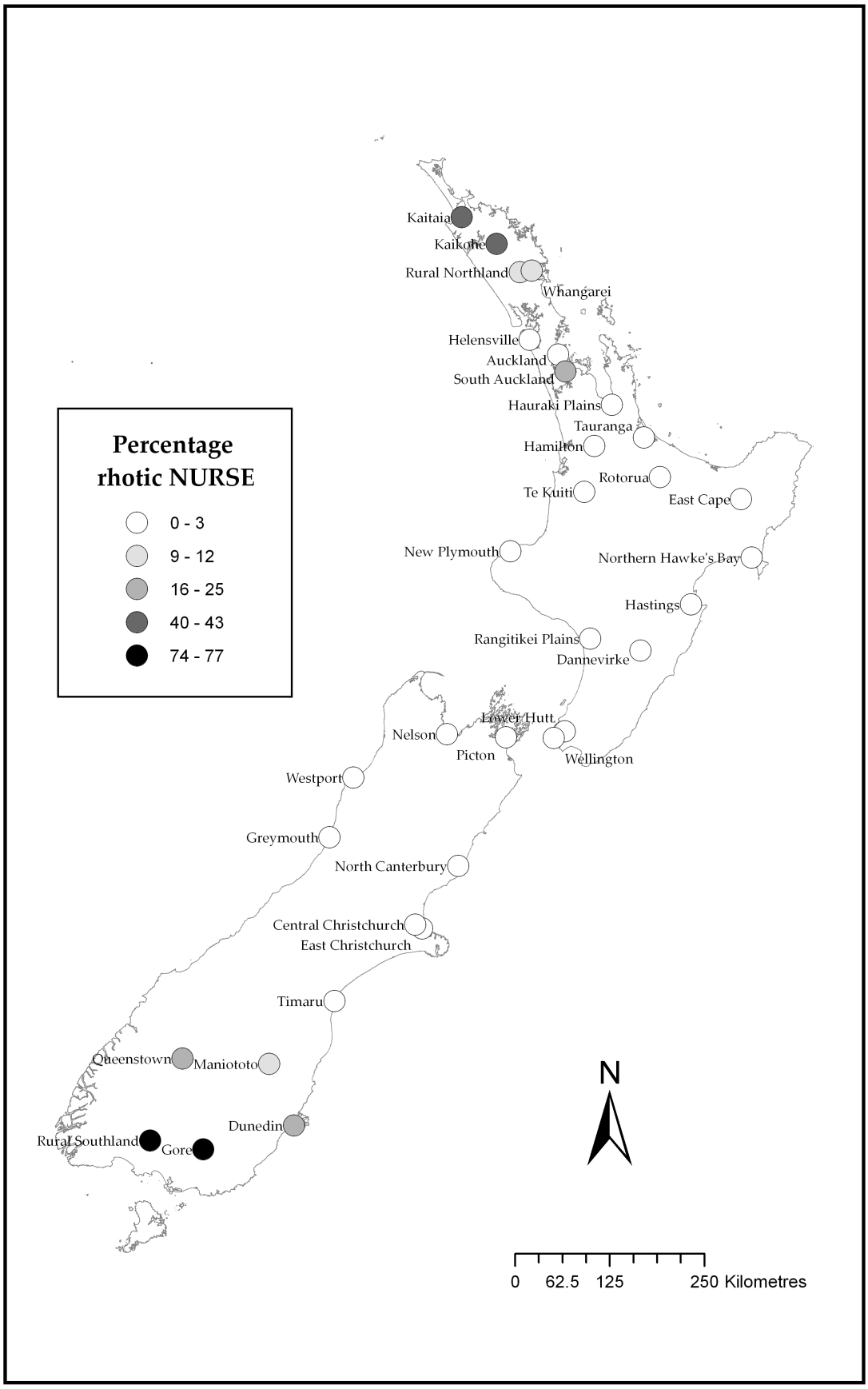
3.1.3. Results

Table 0.1, Appendix A, presents the number of potential tokens of non-pre-vocalic /r/ following vowels other than NURSE for the pilot data set. 1140 tokens were analysed and none were judged to contain realisations of /r/.

Map 3, then, displays the mean proportion of rhotic NURSE for each school (the corresponding data set is displayed in Table 0.2, Appendix A.) Rhotic NURSE appears in two very distinct regions of New Zealand: the southern part of the South Island and northernmost parts of the North Island, and also for many students from School 7 (South Auckland).

The highest frequencies of rhotic NURSE rhoticity are from speakers at two Southland schools, School 32 (Gore) and School 33 (Rural Southland). Three neighbouring schools, Schools 29, 30 and 31 (Queenstown, Maniototo and Dunedin), also show evidence of rhoticity, but with lower frequencies than at the Southland schools (see the legend on Map 3).

There is evidence of rhotic NURSE at all four schools surveyed in Northland. Of these, rhotic realisations are more frequent at Schools 1 and 2 (Kaitaia and Kaikohe) than at School 3 (Whangarei) and School 4 (Rural Northland). Rhoticity is also present at School 7 (South Auckland). Its frequency here is approximately intermediate between the two pairs of Northland schools discussed above. All remaining schools in the data set show no or very little (up to three percent) rhoticity in the context of NURSE.



Map 3: Regional distribution of rhotic NURSE.

The statistical significance of these regional divisions is explored in the CART analysis displayed in Figure 3.1. Figure 3.1 shows that just four schools are significantly different from all others in the data set: the two Southland schools and Schools 1 and 2 (Kaitaia and Kaikohe). These, in turn, differ from one another, with significantly more rhoticity in Southland than at the Northland schools. The levels of rhoticity for Southland's neighbours in Otago, and for Schools 3, 4 and 7 (Whangarei, Rural Northland and South Auckland), though interesting, are not retained as significant in the CART analysis.

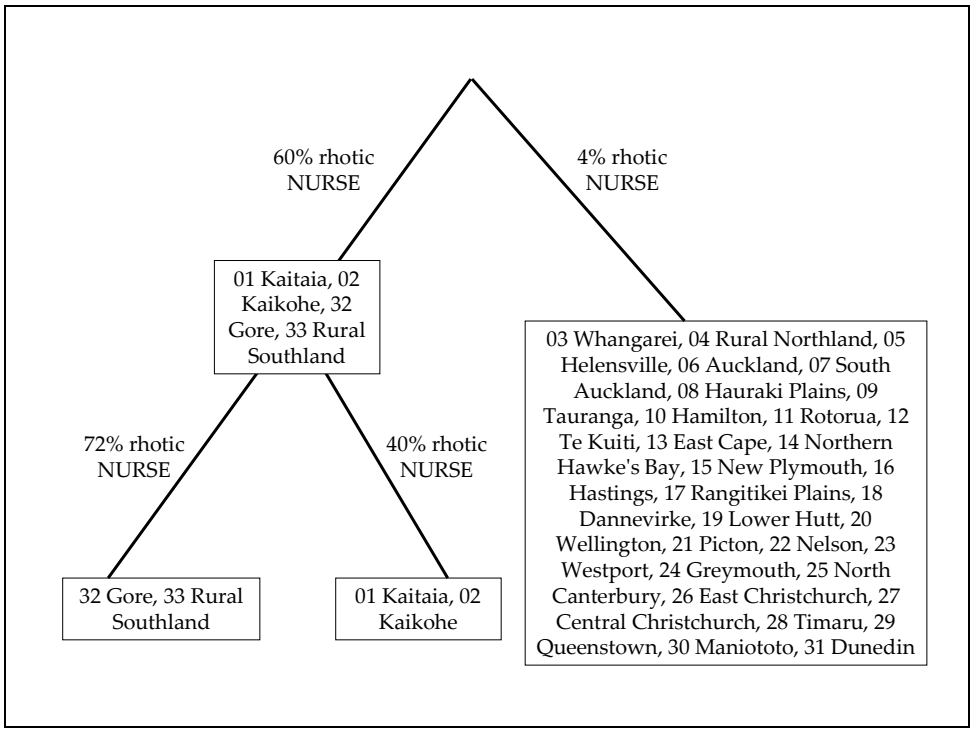


Figure 3.1: CART regression analysis of NURSE rhoticity by location.

A second CART analysis, displayed in Figure 3.2, explores the relative effects of regional and social factors in NURSE rhoticity. Subregion is the most important factor retained in this model: West Northland and Southland and East and South Otago are significantly different from the rest of the data set. Within this smaller subset, the model splits the data by ethnicity: schools with greater than or equal to 6.5 percent Māori students are more likely to exhibit rhotic NURSE. This subset divides still further, with low decile schools more likely to rhotacise NURSE than middle decile schools. In practice, though, this decile division simply separates the West Northland schools and School 33 (Rural Southland), all low decile, from Schools 30

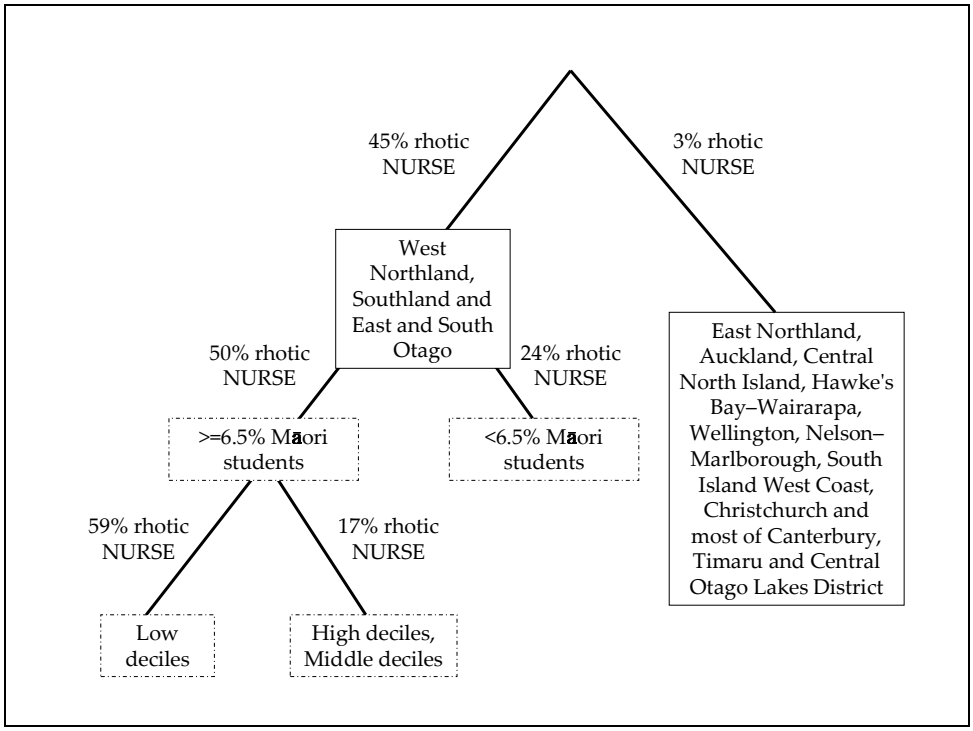


Figure 3.2: CART regression analysis of regional and social factors in NURSE rhoticity.

and 32 (Maniototo and Gore), and probably reflects nothing more than the low incidence of rhoticity at School 30 (Maniototo).

The presence of ethnicity in Figure 3.2 needs to be interpreted in the context of previous studies of non-pre-vocalic /r/ in NZE. Recall that two quite separate participant groups have taken part in these studies: Southland's rhoticity is generally attributed to Scottish settlers in the region, while Starks and Reffell (2005) and Gibson (2005) both link non-pre-vocalic /r/ to Pasifika communities (Gibson's [2005] three hip hop performers are from different parts of New Zealand).

Figure 3.3 repeats the CART analysis presented in Figure 3.2, but excludes data sets from schools in Otago and Southland. For this reduced data set, ethnicity emerges as the only significant predictor of NURSE rhoticity. Schools 1 and 2 (Kaitaia and Kaikohe) have the highest numbers of Māori students, and also the highest frequencies of rhotic NURSE. School 7 (South Auckland) has evidence of rhoticity and a majority of Pasifika students. Ethnicity does not, however, explain all rhoticity outside of Otago and Southland. School 14 (Northern Hawke's Bay) has a similar

percentage of Māori students on its roll to Schools 1 and 2, and they are all low decile schools, yet its students' speech has very little evidence of rhotic NURSE. It

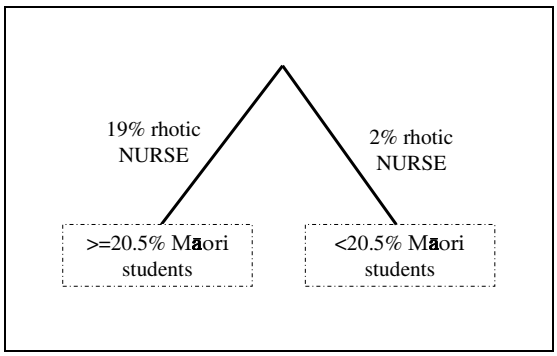


Figure 3.3: CART regression analysis of regional and social factors in NURSE rhoticity outside of Otago and Southland.

appears that ethnicity and region interact as factors in NURSE rhoticity outside of Otago and Southland.

The sound files accompanying this thesis provide further evidence for differentiating between Otago and Southland and North Island NURSE rhoticity. NURSE variants from the Otago and Southland data set appear more strongly rhotic than tokens from speakers in the North Island.

Finally, it remains to present the second set of non-pre-vocalic /r/ tokens after vowels other than NURSE. Recall that all potential tokens of non-pre-vocalic /r/ were analysed for schools with evidence of rhoticity. Like the pilot data set, there are very few realisations of non-pre-vocalic /r/ for these schools, however the results are not entirely categorical. Two schools' data sets include examples of rhotic lettER vowels: there are two tokens from School 7 (South Auckland) and nine from School 32 (Gore) (see Table 0.3, Appendix A). It is difficult to interpret such small figures. Rhotic lettER vowels are a conservative variant for speakers of Southland English (Bartlett 2002), so perhaps young speakers from Gore are more conservative than students from other schools in the region. Rhotic lettER in South Auckland, in contrast, appears to be a recent innovation. It would be interesting to track realisations of lettER in future studies.

3.1.4. Summary and discussion

Realisations of non-pre-vocalic /r/ are restricted to NURSE and a small number of lettER tokens for the young NZE speakers surveyed for this research. Two separate speaker groups are recorded using the variants. Rhoticity in Otago and Southland is best described as regional variation. Rhotic NURSE in the North Island is linked to Māori and Pasifika populations, though region is also a factor in its distribution.

These findings are consistent with Bartlett's (1992, 2002) examination of Southland English. Bartlett predicted a move towards a less r-full accent, with /r/ loss in most non-pre-vocalic contexts, but NURSE rhoticity retained and even revived as an accent marker for younger speakers. The data presented here, collected around ten years after Bartlett's recordings, support these predictions. These results suggest that rhotic NURSE is likely to persist as a regional linguistic marker for Southland speakers. The geographical extent of the Otago and Southland rhotic data is surprising, however, and I discuss the regional patterns in more detail in Section 7.1.

Evidence of rhoticity in Northland and South Auckland follows similar reports from Gibson (2005) and Starks and Reffell (2005). Unlike the latter study, the data presented here suggest that North Island rhoticity is restricted to the NURSE vowel. This is in line with Gibson's (2005) findings for hip hop recordings, but has not previously been reported for spoken NZE data. Variation within the North Island data set not explained by ethnicity is discussed in Section 7.3.

Sound files for non-pre-vocalic /r/

Sound 1: Rhotic NURSE token, School 33 (Rural Southland). "Have you **hurt** your honker boy?" A speaker discussing a bleeding nose.

Sound 2: Rhotic NURSE token, School 29 (Queenstown). "I've been here for **thirteen** [years], all my life." A response to "Are you local children?"

Sound 3: Rhotic NURSE token, School 32 (Gore). "They'd be the most poisonous spider in the **world**." A student discussing daddy long legs.

Sound 4: Rhotic NURSE token, School 2 (Kaikohe). "They think of a **person's** name and they think you go out with them**."** A speaker describes a skipping rhyme.

Sound 5: Rhotic NURSE token, School 1 (Kaitaia). "She's come from **Turkey**." **"**Her dad's **Turkish."** Two speakers discussing a classmate.

Sound 6: Rhotic NURSE token, School 7 (South Auckland). "A tall **person**." A speaker's response to "What is a daddy long legs?"

Sound 7: Rhotic lettER token, School 32 (Gore). "One person who's the **tigger…"** A speaker describes the rules of tig.

3.2. *Linking /r/*

3.2.1. Literature review

There is very little systematic research into linking /r/ in NZE. The term linking /r/ is used to describe an orthographic <r> that is realised across a word boundary, for example *far out* [faɹæᵘt] and *you're it* [joɹɪt]. This feature is variable in NZE (Bauer & Warren 2004: 595) but the social distribution of its variability is largely unknown.

There is quantitative evidence that the absence of linking /r/ may be a feature of Māori English. Hardman (1997) collected interview data from Māori and Pākehā participants in Christchurch. Pākehā speakers pronounced linking /r/ in 78 percent of relevant environments, while the rate for speakers identifying as Māori was 41.5 percent (Hardman 1997: 78). Starks and Reffell (2005) also found very low levels of linking /r/ in the read speech of Māori and Pasifika school children in South Auckland. Their data contained 348 environments for linking /r/ but just nine (2.5%) of these tokens were realised (Starks & Reffell 2005: 41).

A lack of linking /r/ is a possible substratum feature from te reo Māori (the Māori language). Te reo Māori allows sequences of vowels (e.g. Bauer 1993: 544), whereas English disprefers them: the disyllabic vowel sequences in *skiing* or *saying,* for example, are unusual. This is further support for associating an absence of linking /r/ with Māori English.

Finally, Sudbury and Hay (2005) have documented a decline in linking /r/ through early NZE. This suggests that use of the variant is conservative for NZE speakers, so potentially more frequent among higher socio-economic classes. The researchers also provide a set of linguistic factors affecting the distribution of linking /r/ realisation. Their results indicate that linking /r/ is significantly more likely to be pronounced if it either precedes or follows a back vowel, or if it occurs in common collocations (word pairs appearing five times or more in their data set). These factors will be examined in the analysis below.

3.2.2. Methodology

Tokens of linking /r/ were identified using the orthographic search function in ONZEminer. All items with word-final <r> or <re> before a vowel were recorded in a database. Following Sudbury and Hay (2005), items present five or more times in the corpus were marked as common collocations, and back vowels[9] before or after a potential linking /r/ token were noted.

Linking /r/ tokens were analysed auditorily and, like non-pre-vocalic /r/, any perceived consonantal /r/ or /r/-coloured vowel was coded in the /r/ category. The analysis was performed twice for accuracy and each token retained only if the two analyses agreed.

The map presentation for linking /r/ is based on the mean number of realised linking /r/ across all transcripts from a school. It excludes the collocation *far out*, which was categorically pronounced with a linking /r/. *Far out* makes up more than ten percent of the data set, but is unevenly distributed across schools (it is frequent because *far out* was one of the items asked about by the interviewer). The statistical analysis for linking /r/ retains all tokens, including *far out.* There is insufficient data (fewer than ten tokens in some locations) to statistically compare individual schools. The single CART analysis includes all of the social and regional factors set out in Section 2.3.2, with frequency and presence of an adjacent back vowel as additional dependant variables.

The data set for linking /r/ consists of 1018 items, with between eight and 52 tokens from each school (see Table 0.4, Appendix A).

3.2.3. Results

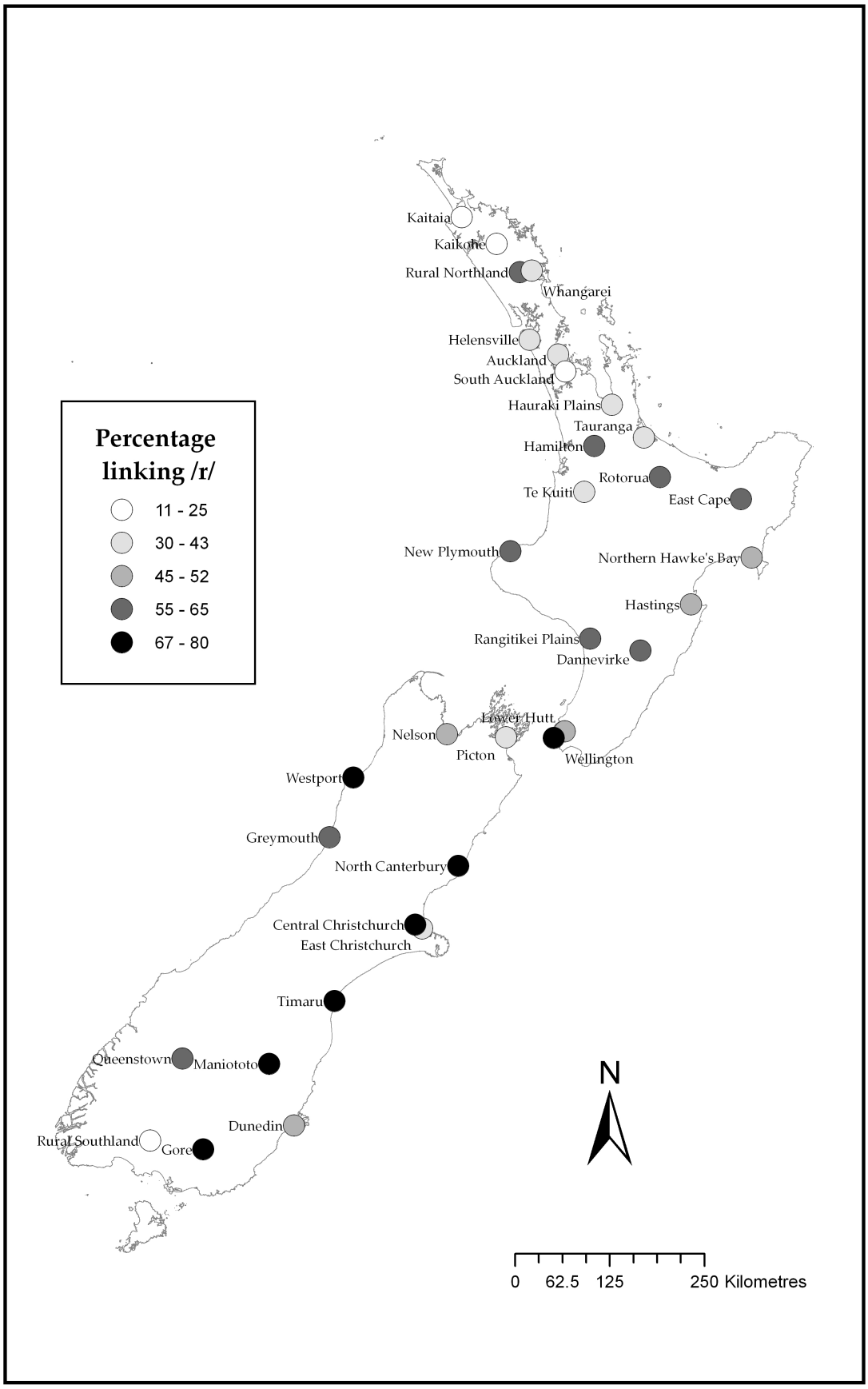
The data set presented here suggests that linking /r/ realisation in NZE is best explained by ethnicity and socio-economic class, but that region may be emerging as a factor in its distribution. Map 4 displays mean proportions of linking /r/ realisation at each participating school. Patterns of distribution are considerably less clear than

[9] Sudbury and Hay (2005) classify THOUGHT, STRUT, LOT, GOAT, GOOSE and MOUTH as back vowels in NZE, and all others as non-back (Jen Hay p.c.).

for non-pre-vocalic /r/: no school's data set has a complete presence or absence of linking /r/.

According to Map 4, the highest frequencies of linking /r/ can be found at School 20 (Wellington) and at six of the thirteen schools in the South Island. The lowest frequencies are mostly in the northern part of the North Island (Schools 1, 2 and 7; Kaitaia, Kaikohe, and South Auckland) but this group also includes School 33 (Rural Southland). Other explanatory factors are likely here: Schools 1, 2, and 7 have large populations of Māori/Pasifika students; School 33 is unusual in that it is both South Island and low decile. Ethnicity and socio-economic class do not, however, appear to play a clear role in determining the group with the next lowest frequencies of linking /r/. There is a band of schools in this group that stretches between Whangarei and Tauranga. The group includes two schools, School 6 (Auckland) and School 9 (Tauranga), which are high decile and have few Māori students at two percent and four percent of their rolls respectively.

Figure 3.4 presents a CART analysis exploring regional, social and linguistic factors in the realisation of linking /r/. According to this model, the most important factor in linking /r/ realisation is the frequency of the collocation containing the example. High frequency collocations are more likely to have an /r/ segment (this includes the collocation *far out*). Social factors appear at the second level of the CART analysis. High frequency collocations are divided by ethnicity, with higher numbers of Māori students disfavouring linking /r/, while low frequency collocations are divided by decile: low decile disfavours. There is no particular reason for either of these social factors to more strongly explain the two data subsets. The results are a reminder that decile and ethnicity are strongly correlated for the schools taking part in the study, and in this case both appear to be factors in linking /r/ realisation.



Map 4: Regional distribution of linking /r/.

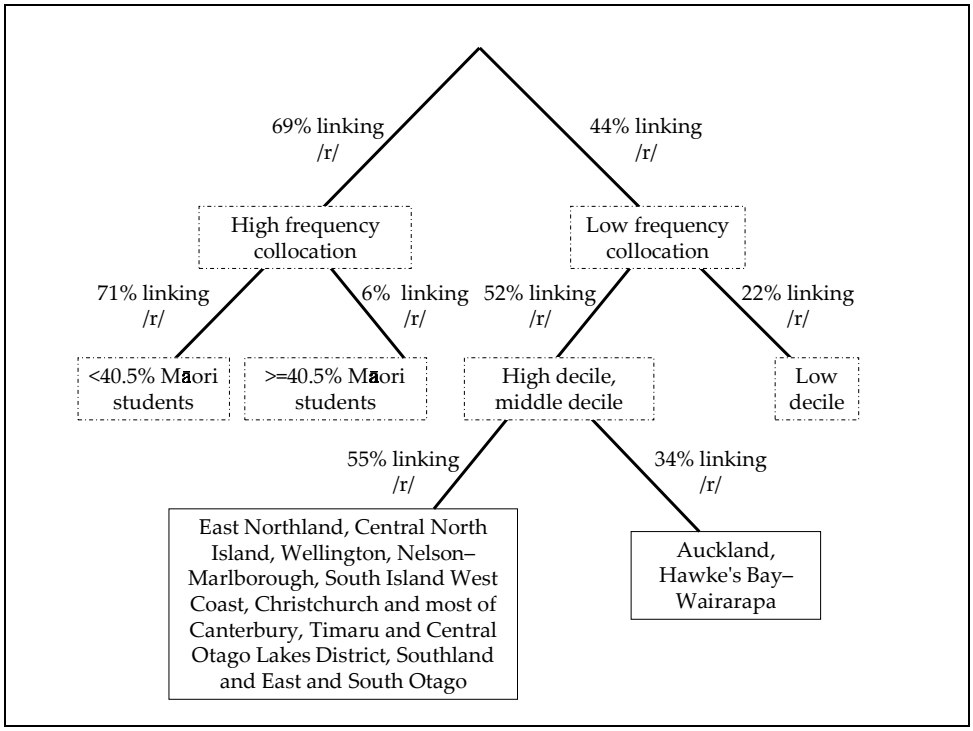


Figure 3.4: CART regression analysis of regional, social and linguistic factors in linking /r/ realisations.

Subregion appears at the third level of the CART analysis in Figure 3.4. Students at high and middle decile schools in Auckland and Hawke's Bay–Wairarapa are significantly less likely to realise tokens of linking /r/ than students at corresponding schools in other parts of the country. This supports the interpretation of Map 4 presented above, where two high decile schools with low Māori populations are part of a band with low frequencies of linking /r/. It is possible that region is emerging as an explanatory factor in linking /r/ realisations for these schools.

3.2.4. Summary and discussion

Ethnicity, socio-economic class and region all appear to contribute to linking /r/ variation among the New Zealand school children surveyed for this research. Linking /r/ is less frequent at low decile schools and at schools with high Māori populations. This is in line with previous research by Hardman (1997) and Starks and Reffell (2005), who also found low levels of linking /r/ for Māori and Pasifika NZE speakers. Socio-economic class and ethnicity are highly correlated for the schools surveyed in this research so it is difficult to determine the relative importance of each as a factor in linking /r/ realisation. The variant is a possible

substratum feature from te reo Māori, so this is a potential motivation for the variation described here.

There are also low frequencies of linking /r/ at a number of schools in the north of the North Island where ethnicity and socio-economic class do not explain its distribution. Taken together, these results suggest that a lack of linking /r/ is innovative in NZE. The most conservative distributions are at schools in the South Island.

Sound files for linking /r/

Sound 8: Linking /r/ token, School 31 (Dunedin). "Pig's snot, **you're out**." A student recites a counting out rhyme.

S**ound 9: Linking /r/ token, School 14 (Northern Hawke's Bay).** "I don't say **far out** I just say far." A student explains the usage of *far out*.

Sound 10: Linking /r/ token, School 24 (Greymouth). "You got to throw a ball at someone and **they're in.**" A student explains how to decide who will be 'in' for tag.

Sound 11: Linking /r/ not present, School 1 (Kaitaia). "I thought you would have a **recorder in** your head." A student, after asking about the interviewer's microphone.

Sound 12: Linking /r/ not present, School 21 (Picton). "And number **four is** king." A student explaining the rules of four square.

Sound 13: Linking /r/ not present, School 25 (North Canterbury). "Well if they touch it **they're out** too." Another explanation of four square.

3.3. *Borrowings: weiner*

The word *weiner*, a mild insult, was discussed in almost all of the interviews analysed for this research and offers another opportunity to test American English influence on NZE, this time in a borrowing situation. Bauer (2005, cited in Monahan 2005), noted that a number of children pronounced *weiner* with a rhotic lettER segment in the interviews he conducted, probably because they had borrowed the term from American television shows. (There is another meaning for *weiner*. Spelled *weaner*, it can refer to "a calf or lamb weaned during the current year" [Simpson & Weiner 1989], but few students reported associating this sense with its use as an insult.)

Weiner occurs 73 times before a consonant or pause in the data set, and in fact just 11 (15%) of these tokens contain a rhotic lettER segment. The rhotic examples come from six schools, all scattered around the country. Rhotic *weiner* tokens tended to occur in isolation during the interviews, as if they are being performed rather than making up part of a speaker's usual repertoire. An example is Sound 14 from School 24 (Greymouth). Sound 15 (from School 14, Northern Hawke's Bay) is interesting because it includes a speaker explicitly stating that *weiner* is borrowed from American cartoons, yet their pronunciation is non-rhotic.

Rather unsurprisingly, then, the young NZE speakers analysed for this research do not appear to have adopted stable pronunciations directly from American television sources. Any appeal to American English influence will involve far more complexity than individual lexical borrowings.

Sound 14: 'Performed' *weiner* token, School 24 (Greymouth) "When they get on your nerves you just say **weiner**."

Sound 15: *Weiner* token, School 14 (Northern Hawke's Bay). "They're mostly American made and they all say **weiners**." A student discussing *weiner* on cartoon television programmes.

Chapter 4: <th> variables

4.1. TH-fronting

4.1.1. Literature review

The term TH-fronting describes realisations of <th> as the labiodental fricatives /f/ or /v/, for example *three* /fri/ or *brother* /brʌvə/. This feature is thought to have emerged relatively recently in NZE – Campbell and Gordon (1996: 40) trace its first published discussion to a Christchurch newspaper column in 1995 – however it is common in many British varieties of English.

Investigations of TH-fronting in NZE have documented examples from speakers in two cities: Christchurch and Auckland. Campbell and Gordon (1996) recorded word list data for 44 intermediate school children in Christchurch. Nine children (21%) produced at least one example of the innovative variants, but only one used them in all possible environments (Campbell & Gordon 1996: 41). A parallel study examined TH-fronting in the speech of adult participants known to use labiodental variants of <th>. Two of the researchers' findings are relevant here. /f/ and /v/ tokens occurred only in the participants' casual speech, not in a formally recorded word list. This suggests that TH-fronting is stigmatised, so likely to be more prevalent in the speech of non-professionals (low decile students for the present study). Campbell and Gordon (1996: 44) also suggest that TH-fronting is more common in content words, for example *think, things, thought* and *throws,* as contrasted with function words[10]. There were no innovative variants in the function words *them, the, those, they, this* and so on; an exception was the grammatical word *with,* and one case of fronting in each of *either* and *both.*

[10] According to Sanford (2006: 152), a content word "conveys substance" and is usually a noun, verb or adjective, while grammatical words "relate one thing to another… [but] do not refer to anything," such as prepositions, quantifiers and connectives.

Starks and Reffell (in prep) have examined TH-fronting in read data from 32 Pasifika and eight Māori children in South Auckland[11]. Their results for Pasifika students divide the data set into voiced and voiceless tokens and the two groups differ considerably: just 2.2 percent of /ð/ tokens were realised as /v/, while tokens of /θ/ are realised as [f] in almost half (47.3%) of relevant cases. Four students use the [f] variant categorically in /θ/ items. Starks and Reffell (in prep) also compared Pasifika and Māori participants and found that Māori participants use the innovative variants less often: just 0.8 percent of /ð/ tokens and 6.4 percent of /θ/ tokens were realised as labiodental fricatives in the Māori data.

From the two studies, then, we have two apparently different linguistic factors affecting TH-fronting: content versus function words (Campbell & Gordon 1996) and voiced versus voiceless tokens (Starks & Reffell in prep). In fact, the two tend to coincide. Outside of the New Zealand context, Trudgill (1988: 43) has noted that TH-fronting does not occur for word-initial tokens of /ð/ in Norwich English. This categorisation includes most of the function words listed by Campbell and Gordon (1996: 44), and most of the /ð/ items examined by Starks and Reffell (in prep), including *the*, tokens of which make up over half of the total voiced data set for the latter study.

We cannot simply dismiss the codification used by the NZE researchers however. Both Campbell and Gordon (1996) and Starks and Reffell (in prep) note a near-complete absence of TH-fronting for tokens with initial /ð/[12] (and Campbell and Gordon [1996] even cite Trudgill [1990] in this context), yet both retain their respective classifications. One way to test whether content or function status and/or segment voicing are relevant considerations – outside of word-initial /ð/ context – is to exclude tokens with word-initial /ð/ and look for patterns in the items that remain. I attempt this in the sections that follow.

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[11] This paper uses the same data set as Starks and Reffell (2005).

[12] One speaker in Campbell and Gordon's (1996: 43) study used word-initial voiced TH-fronting in two percent of relevant contexts. Another appears to use the innovative variant in 61 percent of relevant contexts, but the accompanying text reveals that this speaker's realisation was [d] rather than [v].

4.1.2. Methodology

Potential tokens of TH-fronting were auditorily analysed in each of the items listed in Table 4.1. The lists exclude tokens with initial /ð/ as these rarely exhibit TH-fronting (see Section 4.1.1), and also because analysing every token of *the, they* etc would have been prohibitively time consuming[13]. Remaining items were only included if they were sufficiently frequent to occur in most schools' data sets. This is to avoid major lexical biases, such as with *throw* [frʌᵘ] which occurred 11 times in one child's description of a playground game, but only on a handful of occasions in the rest of the corpus.

A small number of stopped and affricated variants of <th> were also attested by Starks and Reffell (in prep), and have been previously suggested as a potential marker of Māori English (see e.g. Bell 2000). As these most often occur in grammatical words with word-initial /ð/, particularly *the,* they will not be examined in any detail here (though a stopped <th> variant is included on the CD for archiving purposes).

The selected <th> segments were auditorily codified as follows: /θ/ as [θ] or [f], /ð/ as [ð], or [v]. Tokens were omitted if they immediately preceded or followed another <th> segment (to avoid effects of assimilation), and if their realisation did not match any of the variants listed above[14]. As with previous variables, tokens were analysed blind on two occasions, and omitted if these analyses disagreed. Table 4.1 presents TH-fronting items classified as function words or content words, and by voicing of their <th> segment.

The map for TH-fronting displays mean fronted realisations of <th> across all transcripts from each school. The statistical model for TH-fronting defines conservative and innovative realisations of <th> as its fixed variable and includes all

[13] One item with initial /ð/ – *this* – was originally part of the data set. None of the 215 tokens of *this* were realised with a labiodental variant.

[14] In effect, this excluded the elided and approximant variants common in the lexical item *something*, which occurred most frequently in the general extender *or something (like that).* Pragmatic devices often undergo phonological reduction (Schiffrin 1987: 328), and reduced variants did not appear to have an interesting distribution for this corpus.

Table 4.1: TH-fronting items classified by content/function word status (left) and voicing of <th> segment (right).

Content	No of tokens	Function	No of tokens
anything	56	*another*	77
brother	42	*either*	34
everything	12	*other*	166
fourth	20	*with*	187
mother	12	*without*	26
nothing	23		
something	169		
thing	178		
think	151		
thought	18		
three	92		
Total	**773**	**Total**	**490**

Voiceless	No of tokens	Voiced	No of tokens
anything	56	*another*	77
everything	12	*brother*	42
fourth	20	*either*	34
nothing	23	*mother*	12
something	169	*other*	166
thing	178	*with*	83
think	151	*without*	12
thought	18		
three	92		
with	104		
without	14		
Total	**837**	**Total**	**426**

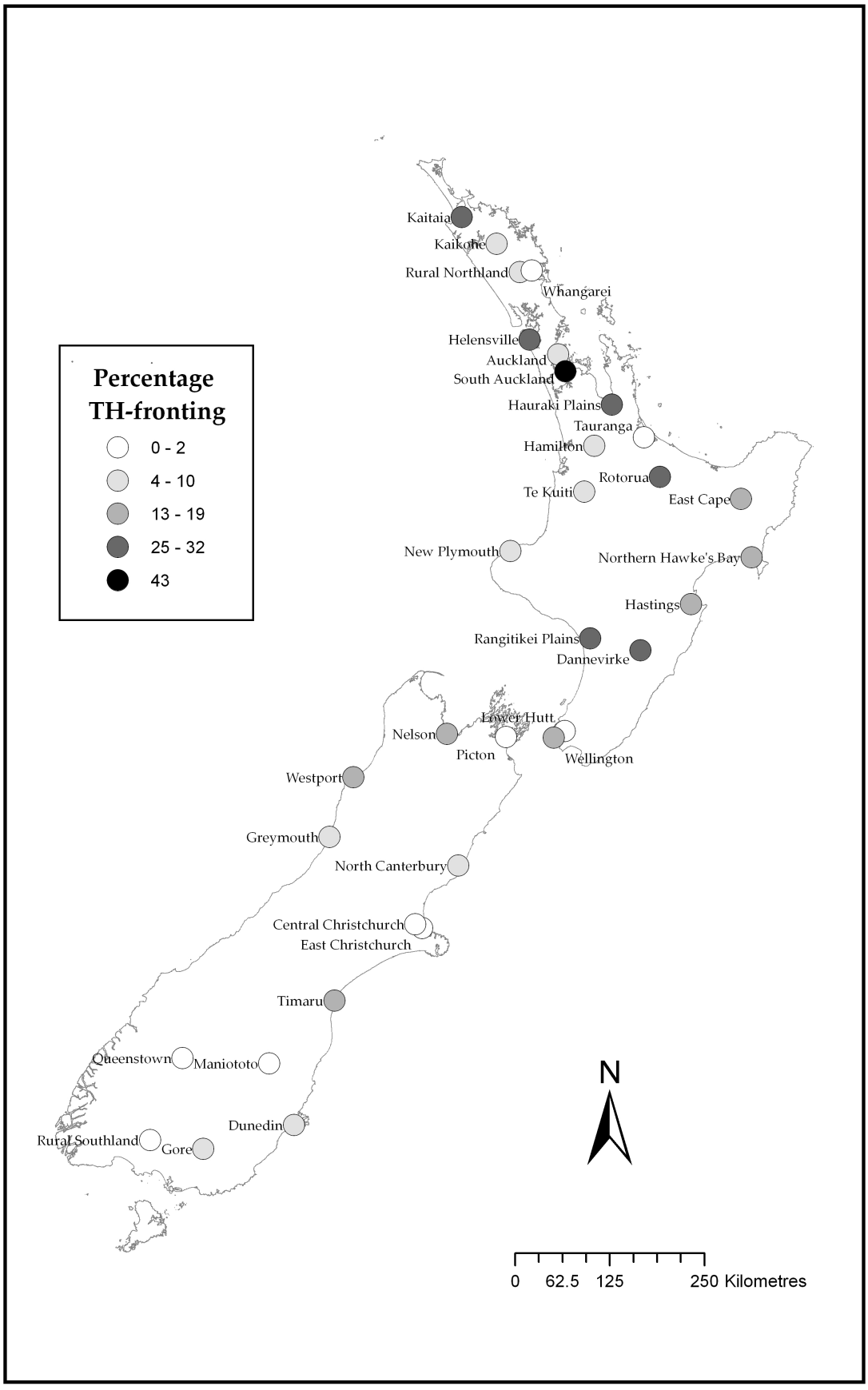
social and regional factors listed in Section 2.3.2, as well as the linguistic factors content/function status and segment voicing. The total data set for TH-fronting consists of 1263 items (see Table 0.5, Appendix B).

4.1.3. Results

The distribution of TH-fronting in this data set is best explained by socio-economic class, but there is also evidence that region and ethnicity may contribute to its variation.

According to Map 5, TH-fronting is more frequent in the North Island, particularly the northern part, though there is still considerable variation. The innovative variants are most frequent at School 7 (South Auckland): the mapping program's natural breaks function separates this school from all others in the data set.

The CART analysis in Figure 4.1 examines the data set by location alone. The first division does not seem to have any obvious regional motivation. The second division is more interesting. Within the group with higher frequencies of TH-fronting, three schools emerge as significantly different from all others, and these, Schools 5, 7 and 8 (Helensville, South Auckland and Hauraki Plains), are all in or near the Auckland region. From this data, Auckland appears to be a centre of TH-fronting among New Zealand school children.



Map 5: Regional distribution of TH-fronting

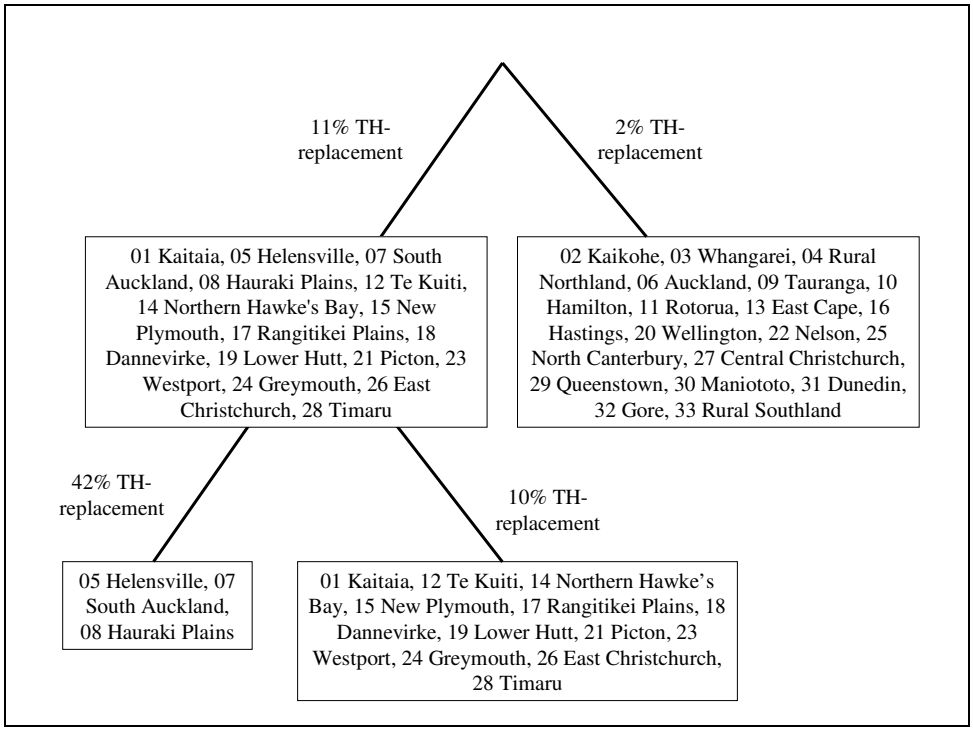


Figure 4.1: CART regression analysis of TH-fronting by location.

Figure 4.2 presents a CART analysis of all potential regional, social and linguistic factors in TH-fronting for this data set. Only decile emerges as a significant factor: low and middle decile schools have more frequent TH-fronting than high decile schools. The Auckland-centred regional grouping discussed above is not retained as significant with all other factors included.

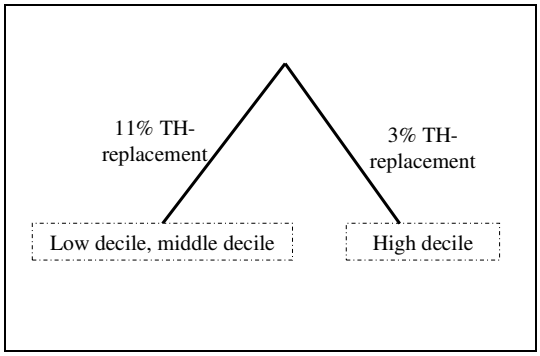


Figure 4.2: CART regression analysis of regional, social and linguistic factors in TH-fronting.

A closer analysis of the data presented in Figures 4.1 and 4.2 suggests there may be an interaction between region and socio-economic class for this data set. The three Auckland-centred schools that emerge in Figure 4.1 are low and middle decile schools, while a fourth school in the region (School 6, Auckland) does not have high

levels of TH-fronting and is high decile. It is not solely decile that explains these results or all low and middle decile schools in the data set would behave similarly, but neither can the results be explained by region alone.

An additional explanation would not have been identified by the statistical model. According to Map 5, the highest frequency of TH-fronting is found at School 7 (South Auckland). Recall that this school has a high Pasifika population and so was excluded from other ethnicity analyses, all of which are based on Māori populations. It is thus possible that Pasifika ethnicity is a factor in TH-fronting. This, too, could interact with the wider regional findings suggested above, as New Zealand's Pasifika populations are centred in the Auckland region.

4.1.4. Summary and discussion

The distribution of TH-fronting in this data set is best explained by socio-economic class, though higher frequencies centred around South Auckland may also be linked to ethnicity and emerging regional variation among New Zealand school children.

These findings support previous studies of TH-fronting. Campbell and Gordon's (1996) research indicates that the variant is stigmatised for Christchurch speakers of NZE, which is reflected in its low frequency at high decile schools in the data set. The high incidence of TH-fronting at School 7 (South Auckland), even relative to other low decile schools, follows similar findings for young Pasifika speakers recorded by Starks and Reffell (2005).

This research has also found evidence of TH-fronting in the Auckland region not explained by ethnicity or socio-economic class data for the schools involved. The possibility of regional variation for TH-fronting is discussed in Section 7.5.

Lastly, neither content/function status nor <th> segment voicing emerged as a significant factor in the variation presented here. There is a more detailed discussion of theoretical points arising from this research in Section 7.7.

Sound files for TH-fronting

Sound 16: Fronted <th> token, School 7 (South Auckland). "We've got **another** game; it's kind of like tiggy." A student discussing playground games.

Sound 17: Fronted <th> token, School 8 (Hauraki Plains). "That's a spaghetti I **think.**" A student naming types of marbles.

Sound 18: Fronted <th> token, School 19 (Lower Hutt). "And if they try and **throw** it at you, you just, you can hit it away **with** your fists." A student explaining a playground game.

Sound 19: Fronted <th> token, School 31 (Dunedin). "And you got to try and pin the **other** person's **thumb** down." A student explaining how to play peaknuckle.

Sound 20: Stopped <th> token, School 2 (Kaikohe). "Oh what's that **other** word?"

Sound 21: Innovative <th> token, School 12 (Te Kuiti). "Peaknuckle peaknuckle, one, two, **three**." This is one of three tokens of an innovative pronunciation of the initial segment in *three,* all from separate speakers. It is included for archiving purposes.

4.2. With *voicing*

4.2.1. Literature review

Voicing of the final segment in *with* is variable in British varieties of English. Jones (1960: 184) describes its realisation as voiced, but adds in a footnote that the segment is voiceless "in the north of England". This broad division appears to be widely accepted.

There are very few references to *with* voicing in NZE. In an exploratory NZE phonetics and phonology paper, Bauer (1986) notes that the final fricative in *with* is "normally" voiceless, attributing this to Scottish influence on NZE. This observation is not apparently based on an empirical data set. More recently, Bauer (forthcoming) has examined word list data from 32 speakers of NZE aged 19-31. These speakers are living in Wellington, but were not controlled for regional origin. The word list data supports his earlier statement: 22 out of 32 (69%) *with* tokens and 20 out of 32 (63%) *without* tokens contain a voiceless <th> segment. The examples in *without* are particularly interesting as they suggest that the voiceless realisation is relatively stable for these speakers, even intervocalically.

Bauer (forthcoming) also cautiously suggests that socio-economic class may be a factor in *with* voicing. Participants who favoured /wɪθ/ had a slightly higher socio-economic score on average – calculated using their level of education and parents' occupations – than participants using the pronunciation /wɪð/. This would indicate that /wɪθ/ "might be the conservative and prestige value" (Bauer forthcoming), but Bauer notes that this "does not entirely fit" with his own informal observations.

In South Auckland, Starks and Reffell (in prep) recorded one token of *with* for each of their forty young Māori and Pasifika informants. In contrast to Bauer's (forthcoming) findings, all but one of these students use a voiced <th> segment, either /v/ or /ð/.

Finally, some evidence of variation in *with* voicing can be inferred from Campbell and Gordon's (1996) study of TH-fronting. They report realisations of fronted

variants of *with* in conversations with five 12 and 13-year-old speakers of NZE from Christchurch. Three of these speakers use the variant /wɪf/ and two use /wɪv/, which suggests that their dental fricative realisations might also vary by voicing. There is too little data here to indicate which might be the more common realisation of the two.

4.2.2. Methodology

Tokens of *with* (and *without*) were analysed auditorily. The categorisation was binary by voicing, and included both dental and labiodental fricative examples: /ð/ and /v/ in the voiced category and /θ/ and /f/ in the voiceless category. Items were omitted where the following word began with a dental fricative (to prevent any influence from assimilation), and also where the item was followed by a pause (as utterance final consonants are often devoiced). Items were also omitted if the final <th> segment was elided.

The total data set consists of 207 items (see Table 0.6, Appendix B). This is clearly a small data set: the number of tokens from each school ranges from one to twelve. Following the guidelines set out in Section 2.3.2, this means that potential regional variation will be statistically examined by grouping data into the regions and subregions proposed by Bauer and Bauer (2003). The CART model defines <th> voicing as its fixed variable, with all social and regional factors listed in Section 2.3.2, and voicing of the following sound as a potential linguistic factor. The map for *with* voicing presents the proportion of voiced <th> segments in *with* at each school.

4.2.3. Results

Despite the small data set for this variable, the results suggest that region is the best explanation for the distribution of *with* variants. Voiced and voiceless tokens are similarly distributed between *with* (45% voiced <th>, n= 181) and *without* (48% voiced <th>, n=25), which supports combining the data sets for both items.

The first thing to point out on Map 6 is the number of schools with categorical voiced or voiceless realisations of the <th> segment. These schools are not particularly representative of the variants' distribution, as their results often reflect

just one or two tokens of *with* or *without.* The most interesting contrast on Map 6 is between those schools with light grey symbols, where <th> is more frequently voiceless in the relevant items, and schools with darker grey symbols, where <th> is more frequently voiced. Excluding School 21 (Picton), the voiceless variant appears more common in the South Island, and the voiced variant more common in the North.

This analysis is supported by the CART regression tree presented in Figure 4.3. The major division for this data set is between all North Island subregions – plus Nelson–Marlborough – and all remaining South Island subregions. The third division in the CART analysis is also based on subregions. This divides the mostly North Island data set along the boundary between Central North Island and Hawke's Bay–Wairarapa/Wellington (though West Northland does not pattern with the northernmost subregions). A potential division here is interesting as it corresponds with the boundary of Bauer and Bauer's (2003) Northern and Central Regions. It is also interesting that Cook Strait does not prevent Nelson–Marlborough grouping with lower North Island subregions.

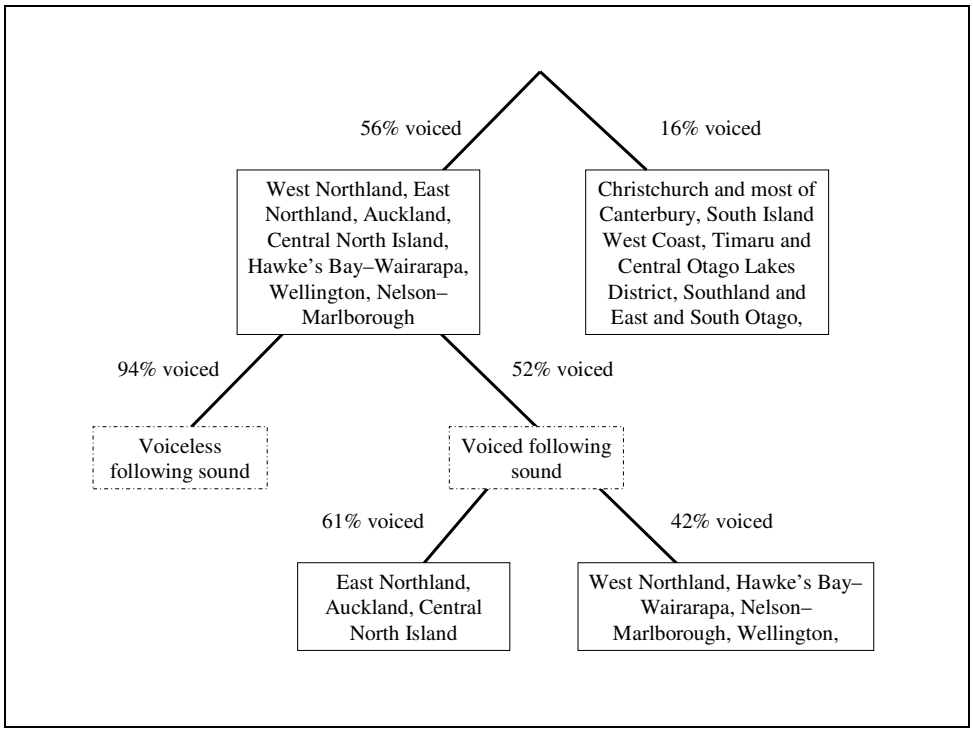
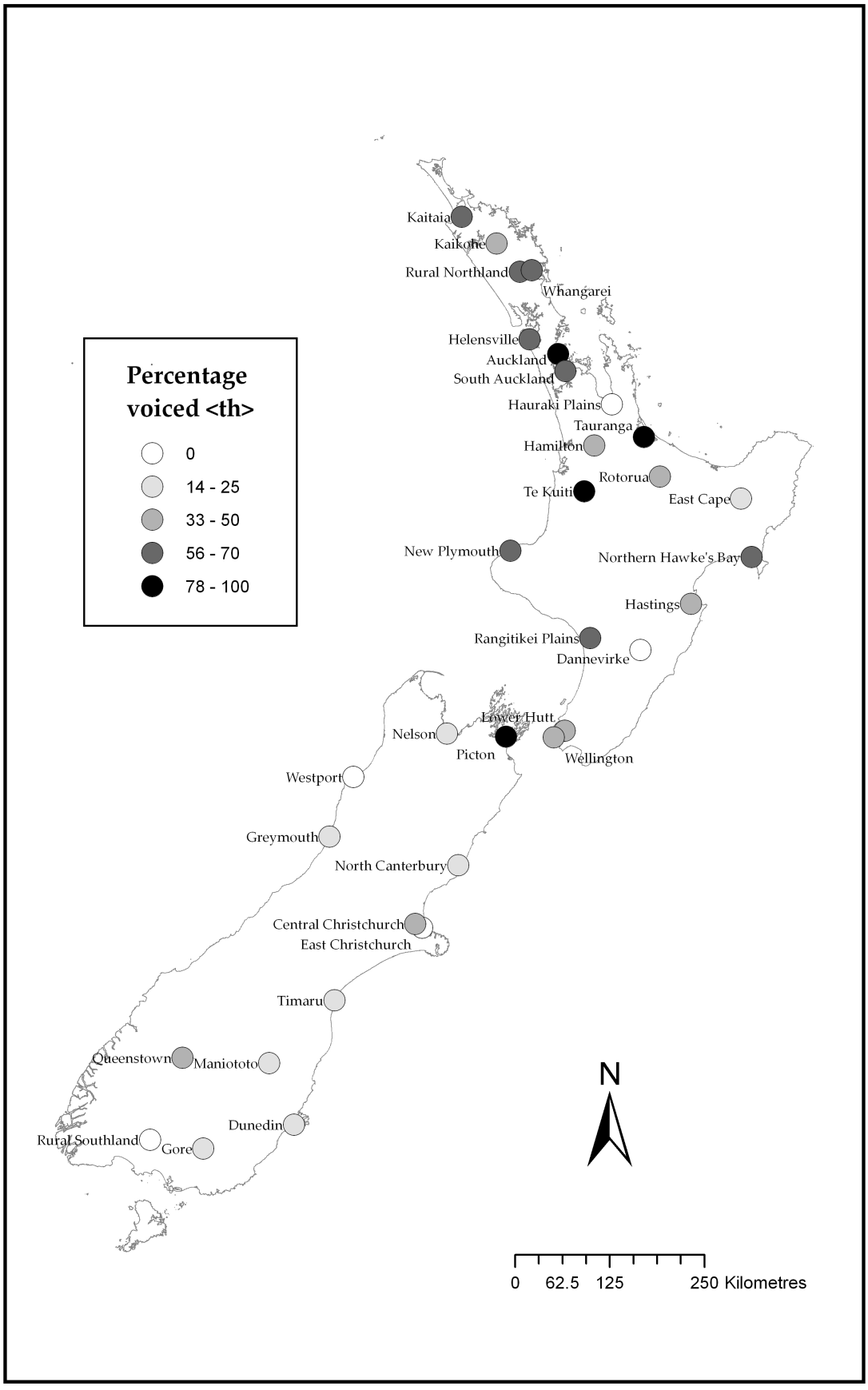


Figure 4.3: CART regression analysis of regional, social and linguistic factors in *with* voicing.



Map 6: Regional distribution of voiced <th> in *with*.

The second division in Figure 4.3 separates the northern data set by the voicing of each segment's following sound. The influence here is not as we would expect: a voiced <th> segment is less likely where the following sound is voiced. There are relatively few tokens of <th> preceding a voiceless sound, however, so this result is probably best interpreted as another indication that *with* voicing is relatively stable in both contexts.

A fourth level of divisions was omitted from Figure 4.3. These divide the two northern data sets by ethnicity. The direction of influence is different for each group, however, so that fewer Māori students favoured voiced *with* pronunciations in one group while the same factor disfavoured voiced *with* in the second group. These divisions emerge so far down in the analysis that it is probably wise to discard them. This means that neither ethnicity nor socio-economic class is an obvious factor in *with* voicing.

4.2.4. Summary and discussion

Region is the only factor to statistically explain variation in *with* voicing for the young New Zealanders surveyed for this research. Voiceless *with* is more frequent for South Island speakers, excluding those in Nelson–Marlborough, the South Island's northernmost region. The voiced variants are more frequent from Nelson–Marlborough northward, and particularly in the Central North Island subregion and beyond.

This regional distribution is not predicted by earlier surveys of *with* pronunciation in NZE, though Starks and Reffell's (2005) South Auckland data is compatible. Socio-economic class is not a significant factor in the data set; note, however, that the direction of socio-economic variation noted by Bauer (forthcoming) reflects general socio-economic differences between North and South Island participating schools. The analysis presented here suggests that region explains any socio-economic variation in the variants' distribution, but it is possible that a larger data set would reveal more complicated interaction between the two factors.

Given the distribution of British English *with* variants reported by Jones (1960: 184), early British settlement patterns are a possible source of the variation reported here for NZE (see Section 7.1).

Sound files for *with* voicing

Sound 22: Voiced *with* token, School 6 (Auckland). "Something to do **with** blue." A student trying to remember a counting out rhyme.

Sound 23: Voiced *with* token, School 5 (Helensville). "Oh what's that one **with** Elvis Presley?" A student trying to remember a clapping game.

Sound 24: Voiced *with* token, School 9 (Tauranga). "With a hip hop don't stop, **with** a hip hop full stop." A student reciting a skipping rhyme.

Sound 25: Voiced *without* token, School 3 (Whangarei). "Yeah so that way you can cut in **without** annoying the person.**"** A student explaining 'Chinese swaps'.

Sound 26: Voiceless *with* token, School 20 (Wellington). "You might play **with** a ball." A student discussing a playground game.

Sound 27: Voiceless *with* token, School 30 (Maniototo). "It's a big spider **with** long legs." A student's response to "What is a daddy long legs?"

Sound 28: Voiceless *with* token, School 28 (Timaru). "Is that like **with** a bunk bed?" A student's response to "Do you know what bunking means?"

Sound 29: Voiceless *without* token, School 22 (Nelson). "And I guess it could be played **without** the ball." A student explaining the difference between the games bullrush and barbidore.

Chapter 5: Vowel Analyses

5.1. FOOT movement

5.1.1. Literature review

The FOOT vowel was chosen as a variable for this research because a previous small scale paper (Kennedy 2004) indicates that it is undergoing change in NZE, and also that its quality varies between Hamilton speakers and Wellington speakers. It is not clear from that paper whether the Hamilton or Wellington speakers' data sets characterise changes taking place in other regions of New Zealand.

FOOT is a centralised back vowel in NZE, slightly lower and fronter than THOUGHT in previous accounts of NZE vowel qualities (e.g. Easton & Bauer 2000: 115-116). These results have led to suggestions that FOOT and THOUGHT may be distinguished by length rather than quality for some speakers of NZE (Bauer & Warren 2004: 593).

Such a prediction does not tally with Kennedy's (2004) findings. Kennedy (2004) examined wordlist data in an /hVd/ context from the New Zealand Spoken English Database (NZSED, Warren 2002). The data compared young (18-30), mid-age (31-45) and older (45-60) female speakers from Hamilton and Wellington, with six speakers in each cell and a single token from each speaker. While there was a clear overlap of FOOT and THOUGHT ellipses for older participants in both cities, the FOOT vowel appeared to be moving in different directions for the younger speaker groups. Figure 5.1 reproduces vowel ellipses for these speakers: FOOT appears to have fronted for the young Wellington speakers, while it is notably both lowered and fronted for the Hamilton group.

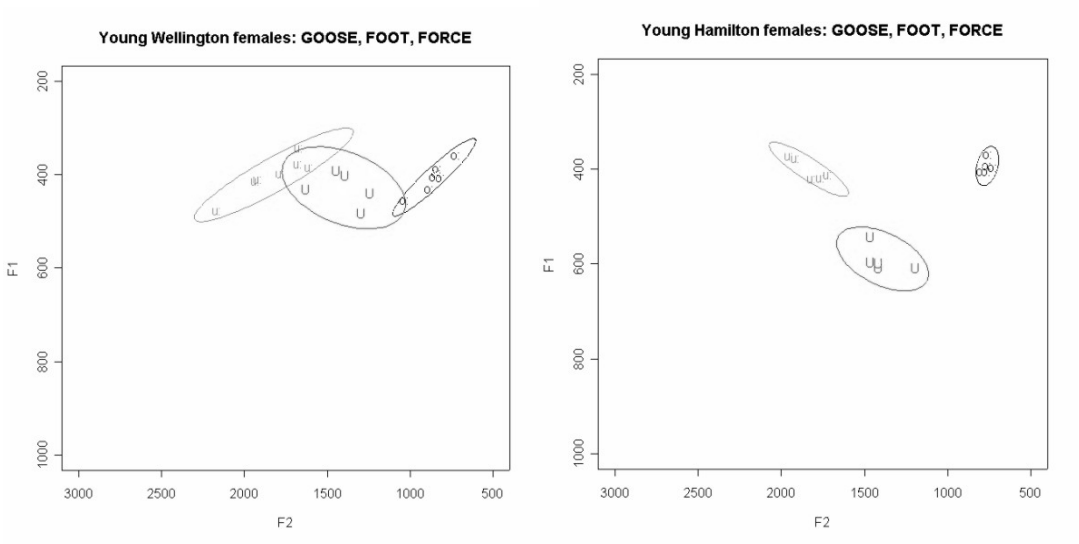


Figure 5.1: Vowel ellipses for GOOSE, FOOT and THOUGHT for young Wellington (left) and Hamilton (right) female speaker groups (from Kennedy 2004).

To anticipate the rather unsatisfying results of this section, it is worth pointing out the major differences between the data set for Kennedy (2004) and that of the research presented here. The data set for this research is problematic for acoustic analysis mostly because it is derived from conversation rather that word lists. This makes variables such as stress and speech rate far more important (efforts to reduce the effect of stress are outlined in Section 5.1.2). We would expect vowels with less marked stress to be more centralised than clearly stressed examples, and there is a continuum between stressed and unstressed tokens here that is very difficult to control in analysis. The use of conversation data also means that linguistic environments for each lexical set are not necessarily comparable. Langstrof (2004) has also analysed interview-based NZE data and found considerable variation within single vowel phonemes before certain consonant sounds (and not solely before /l/ and /r/, where neutralisations might be expected (see Section 5.2)). Such issues are less crucial for the binary variables discussed in previous chapters.

The second major limitation of this data set is the relatively small amount of relevant data it contains. THOUGHT, GOOSE and FOOT are not common in English: Gimson (1980: 149) ranks them as the eleventh, twelfth and thirteenth most frequent English vowel sounds respectively. This has meant that five schools have fewer than four tokens of FOOT, and these from an unknown number of speakers. We can

contrast this with Langstrof's (2004) data set, which consists of between 40 and 100 tokens of each vowel from each of 30 speakers. These limitations taken together – the quality and amount of data – mean that results for FOOT movement are very difficult to evaluate.

5.1.2. Methodology

Tokens of non-pre-lateral GOOSE, FOOT and THOUGHT were analysed using the computer acoustics program Praat (Boersma & Weenink 2005). F1 and F2 values were recorded for each token, both taken from the second quarter of the vowel's duration. This technique was used in an attempt to avoid formant transitions from preceding consonants, and also to avoid potential diphthongisation in GOOSE and THOUGHT.

As mentioned above, tokens were only included if the relevant syllable was judged to bear primary lexical stress. In practice, because utterances were frequently incomplete or otherwise questionable, the policy for their inclusion particularly required that each vowel have a relatively stable formant structure, at least for the portion used for analysis.

The total data set for FOOT movement consists of 227 tokens of FOOT, 260 of THOUGHT and 417 of GOOSE (see Table 0.7, Appendix C). Given the limitations of this data set, it is not possible to compare individual schools in this section and data is grouped into the 11 subregions used in previous chapters.

Grouping the data in this way makes it difficult to follow up the findings reported in Kennedy (2004). In comparing Wellington and Hamilton speakers, recall that the Wellington subregion consists of schools in the Rangitikei Plains and Lower Hutt, as well as Wellington city (Schools 17, 19 and 20), while Hamilton speakers (School 10) are classified in the Central North Island subregion with speakers from Hauraki Plains, Tauranga, Rotorua, Te Kuiti, New Plymouth and the East Cape (Schools 8, 9, 11, 12, 13 and 15).

The results for FOOT movement are presented in vowel ellipses created using Emu/R (open source). The ellipses display Hz values for F1 and F2 in Bark, a scale designed to more accurately represent auditory filters used in speech perception (Traunmüller 1997). The plot size matches the range set by Boe, Heim, Honda and Maeda (2002) for children's maximal vowel spaces; this is larger than for adult speakers. Each ellipsis represents 95 percent of all tokens of a vowel, and takes into account the formant values' standard deviation.

I restricted analysis of potential FOOT movement to visual representations, rather than attempting statistical comparisons between speaker groups. There are two reasons for this decision. Firstly, here we are interested in the direction of potential changes in the FOOT vowel, rather than attempting to comment on any absolute degree of movement. Data from both of the regions surveyed in Kennedy (2004) indicates that vowel shift is taking place, but in quite different directions. Secondly, neither THOUGHT nor GOOSE provides a particularly stable comparison point for the FOOT vowel. I attempted to measure tokens of schwa as a comparison, but found it very difficult to find clearly unstressed syllables with stable formant bands.

5.1.3. Results

Figure 5.2 displays GOOSE, FOOT and THOUGHT vowel ellipses for each of the 11 subregions adopted in this research. It is very difficult to infer meaningful results from these figures. Each ellipsis is notably larger than those presented in Figure 5.1 which suggests considerable variation within each subregion.

In general, the mid-point of each FOOT ellipsis appears approximately mid-way between the mid-points of THOUGHT and GOOSE, so perhaps this is evidence of FOOT fronting in comparison to previous accounts (e.g. Easton & Bauer 2000). Two subregions, East Northland and Central North Island, appear more conservative than others, with nearer ellipsis centroids for FOOT and THOUGHT. None of the figures suggest movement towards a lower FOOT realisation, such as indicated by Kennedy (2004), except perhaps West Northland.

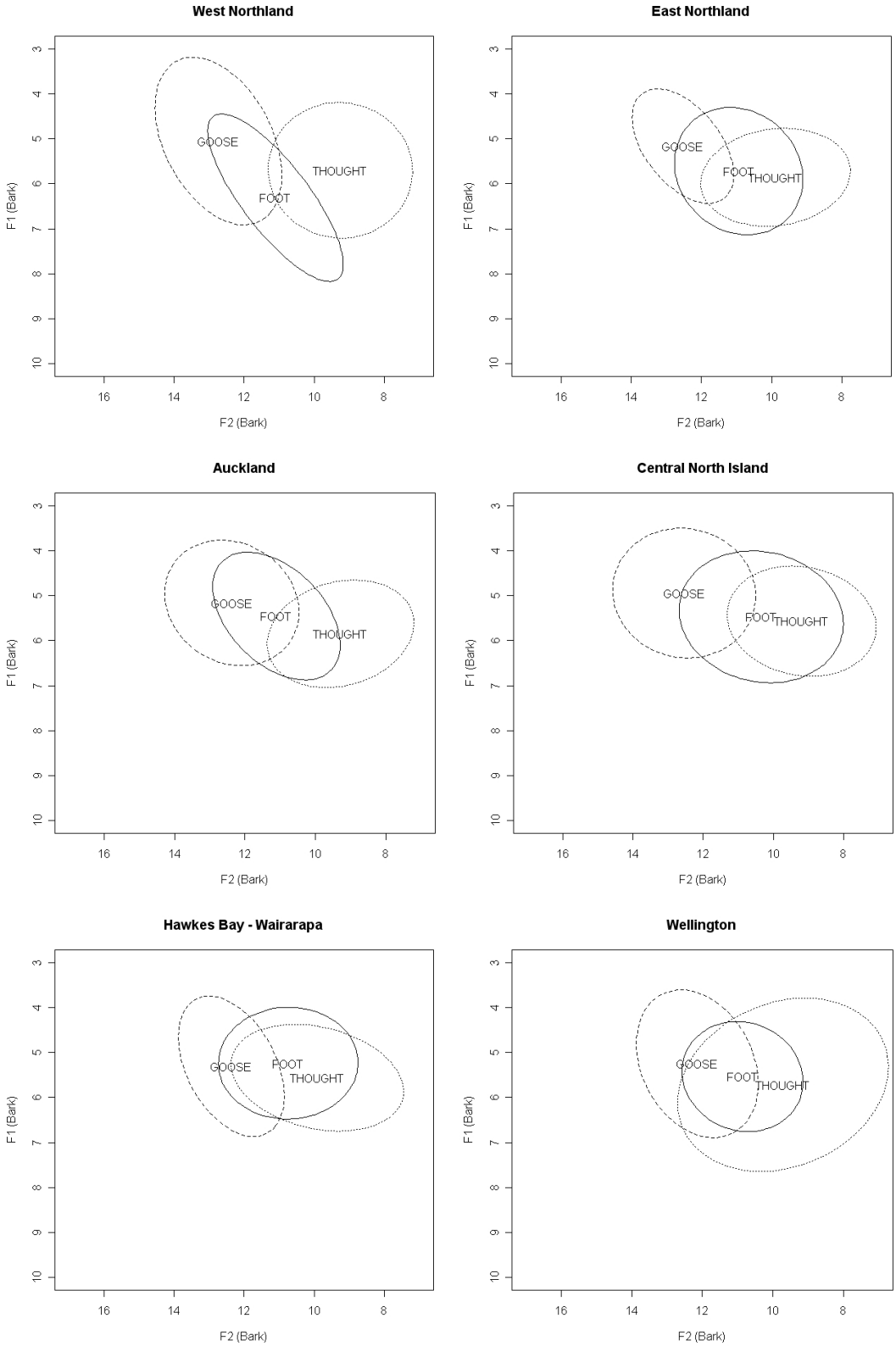


Figure 5.2: Vowel ellipses for GOOSE, FOOT and THOUGHT in each subregion.

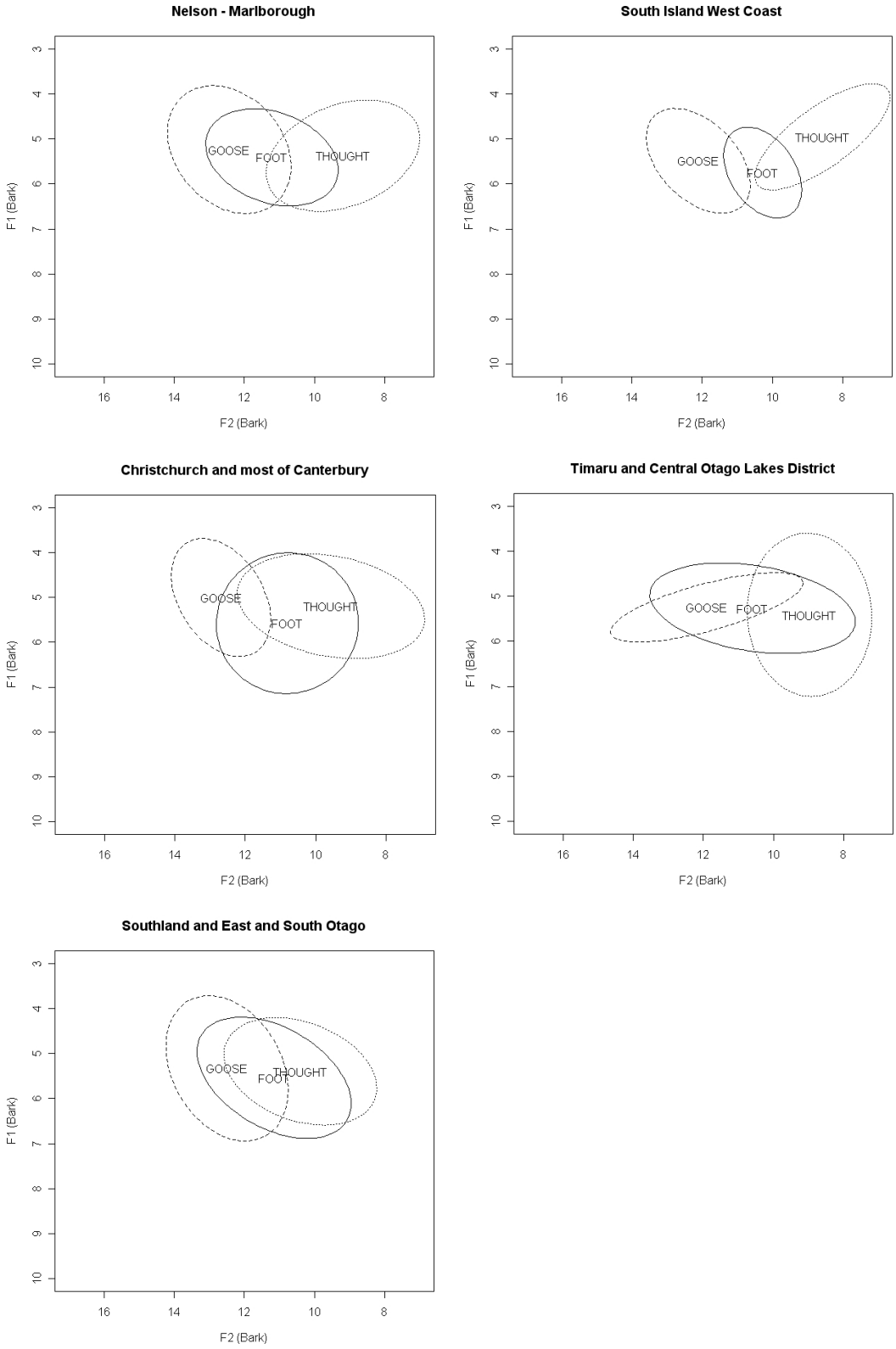


Figure 5.2 (cont.): Vowel ellipses for GOOSE, FOOT and THOUGHT in each subregion.

Comparable ellipses were generated for each decile group and for the ethnicity groupings set out in Map 2. There is no clear influence from either of these factors on FOOT realisations in this data set (see Figures 0.1 and 0.2, Appendix C).

5.1.4. Summary and discussion

The results presented here suggest that this data set is not well suited to acoustic vowel analysis. It is not possible to claim more than a general indication of FOOT fronting across the data set. Social factors did not emerge as significant predictors of FOOT realisation, nor is there any evidence of regional variation.

5.2. *Neutralisation of FOOT and THOUGHT before /l/*

5.2.1. Literature review

NZE speakers neutralise a number of vowel distinctions before /l/, so that word pairs such as *salary/celery* and *Allan/Ellen* can be homophones (Bauer & Warren 2004: 585). The neutralisation of DRESS and TRAP in this context, as in the above examples, is perhaps the best known case of this phenomenon, but Bauer and Warren (2004) list nine pairs of lexical sets for which neutralisation is possible for NZE speakers. Thomas and Hay (forthcoming) analysed pre-lateral DRESS and TRAP in reading lists for 16 participants aged 18-30 and found that 12 speakers (75%) do not maintain a significant difference between their distributions of the two sounds. I have not been able to find empirical reports of other potential neutralisations, but Gordon et al (2004: 33) cite "Canterbury corpus data" as providing evidence for a three way neutralisation between LOT, GOAT and STRUT before /l /, and a four way neutralisation between KIT, FOOT, THOUGHT and GOOSE before /l/ (though they note that pre-lateral GOOSE and FOOT remain distinguished by length). The researchers do not offer any factors for the social distribution of these features.

It is possible, however, that at least one such neutralisation is regionally variable in NZE. Bauer and Bauer (2002a) found evidence of FOOT and THOUGHT neutralisation in the name of a schoolyard game, *bullrush.* In the interviews also used for the present research, Bauer and Bauer (2002a: 183) noted that some children "really couldn't hear whether the first element of this word should be related to *bull* or *ball*." (There are sound files illustrating this confusion on the CD.) It appeared that children in the Central Region, and particularly Wellington, had the most difficulty distinguishing the two possible spellings, from which the researchers suggest that the innovation is most advanced in the Wellington region. The data set presented in this section aims to investigate Bauer and Bauer's (2002a) claim.

5.2.2. Methodology

All of the procedures for measuring formant values and determining stress set out in Section 6.1.2 apply here, as does the discussion of how limiting the data set appears to be for vowel analyses.

Two forms of data analysis are presented in this section. Figure 5.3 displays vowel ellipses generated in the manner described above. Figure 5.4 presents Pillai scores for pre-lateral THOUGHT and FOOT in each subregion. The Pillai score is a multi-variate statistical measure used to measure the distance between two vowel distributions (Olsen 1976, cited in Warren, Hay & Thomas 2006, forthcoming). As a perspective for the figures presented below, the average Pillai score for the distance between non-pre-lateral FOOT and THOUGHT across all regions is 0.359. All figures were generated using the statistics program SPSS 12.0 (SPSS 2003).

A limitation of the Pillai score is that it does not provide a meaningful measure of significance alongside the distance measurement. This is because the statistical measure is designed so that it is more likely to be significant if there is a clear distinction between the two distributions, as well as taking into account the amount and variability of the data. For merger data, this limitation means that often we can only say that two distributions are not significantly different, rather than reliably state that they are merged.

The data set for FOOT and THOUGHT before /l/ consists of a total of 181 pre-lateral FOOT tokens, and 259 pre-lateral THOUGHT tokens, resulting in ellipses for each subregion based on between eight and 55 data points (see Table 0.8, Appendix C).

5.2.3. Results

Figure 5.3 displays pre-lateral FOOT and THOUGHT ellipses for each subregion. Once again, it is difficult to infer clear results from these figures. There is considerable overlap for ellipses from all 11 subregions, which indicates that a merger is underway for participating speakers but that no particular part of the country is

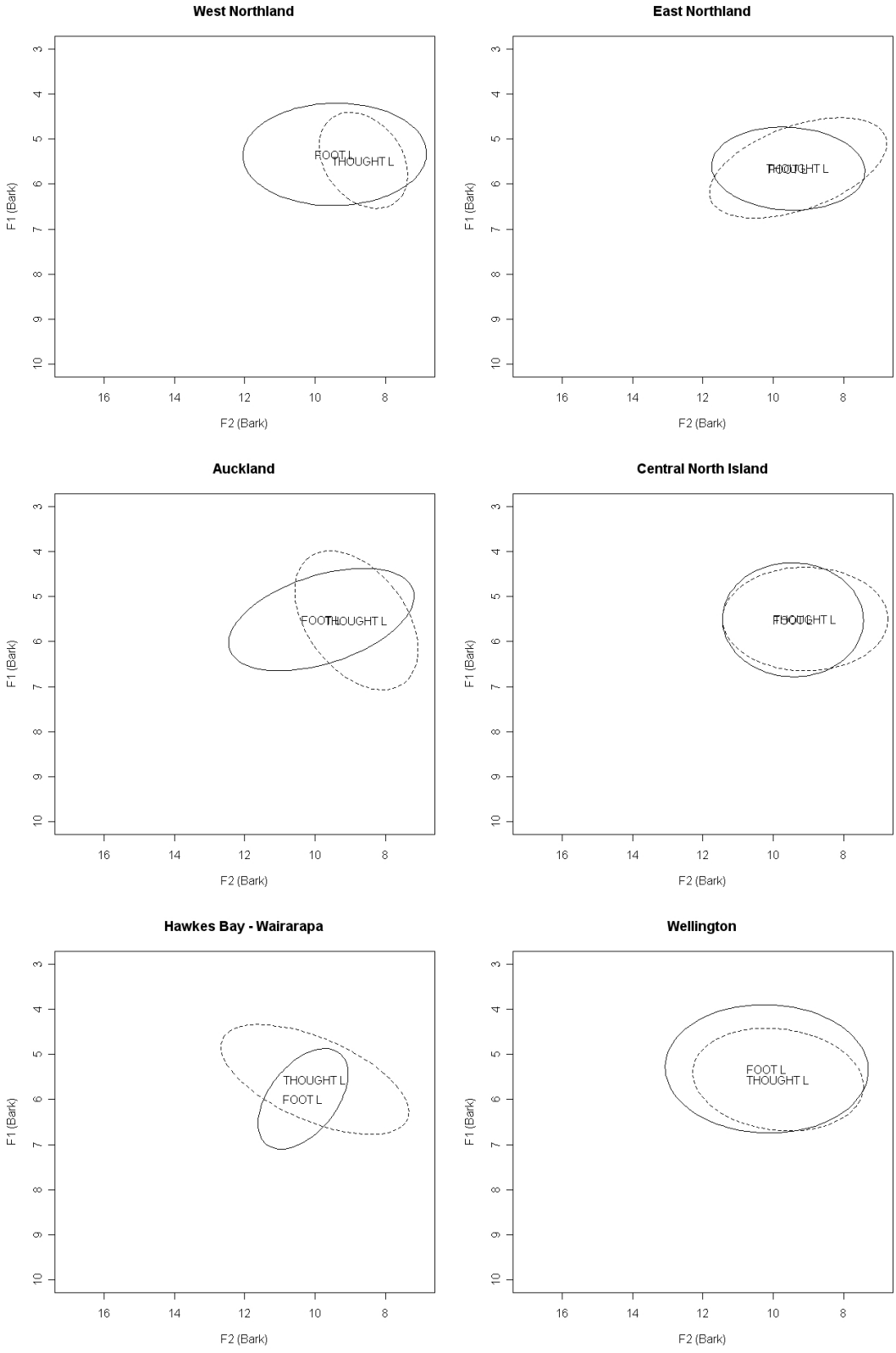


Figure 5.3: Vowel ellipses for FOOT (solid line) and THOUGHT (dotted line) before /l/ by subregion.

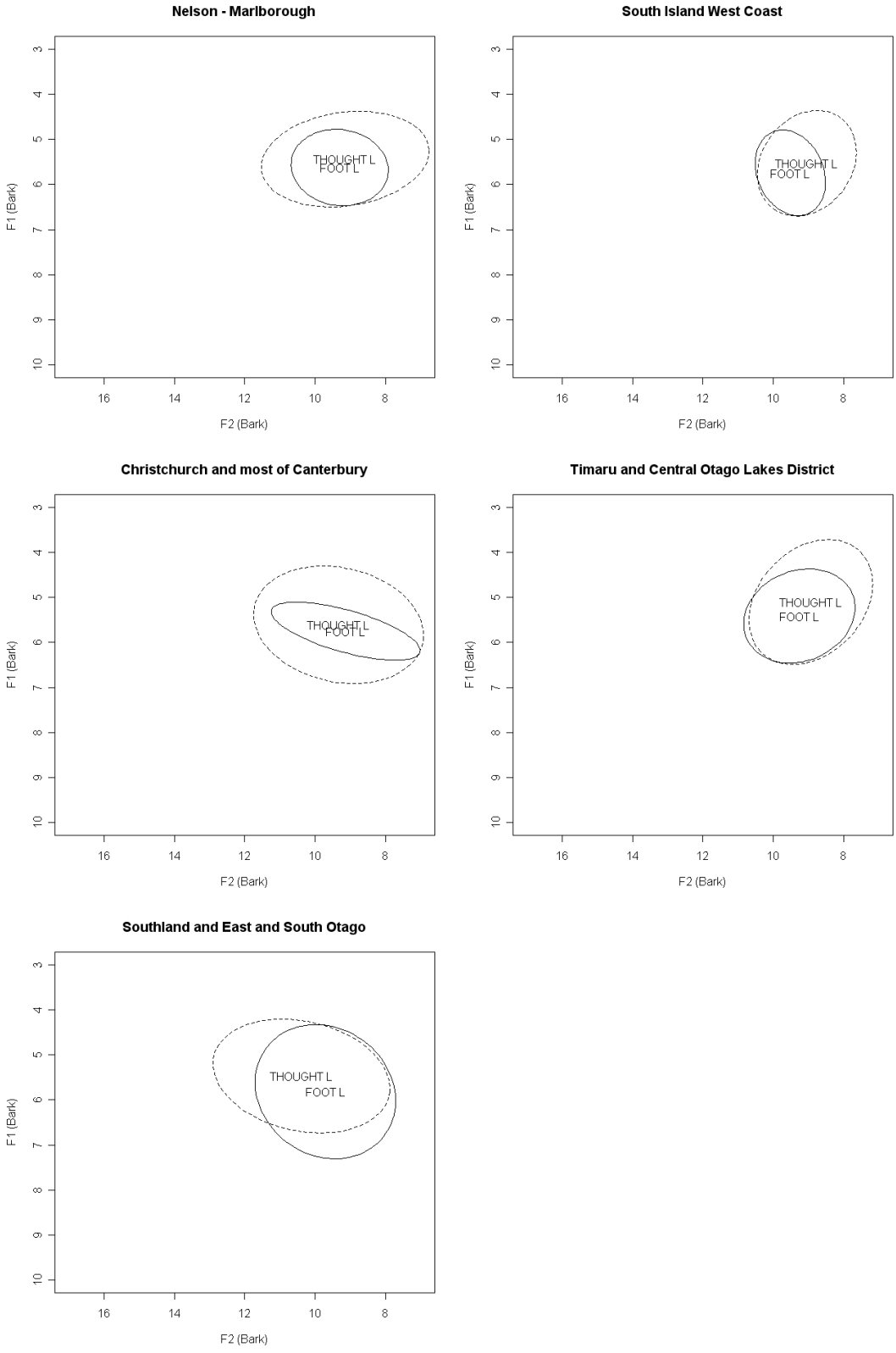


Figure 5.3 (cont.): Vowel ellipses for FOOT (solid line) and THOUGHT before /l/ by subregion.

leading the innovation. As with the FOOT data above, ellipses based on socio-economic class and ethnicity divisions do not offer an additional insight. These, too, show considerable and relatively uniform overlap in the distributions of FOOT and THOUGHT before /l/ (see Figures 0.3 and 0.4, Appendix C).

Figure 5.4 presents Pillai scores for the distance between pre-lateral FOOT and THOUGHT for speakers from each subregion. The Pillai scores again offer little support for a Wellington-led merger, but nor do they reliably dispute Bauer and Bauer's (2002a) suggestion. The Wellington subregion has a low Pillai score relative to several other subregions, but not markedly so.

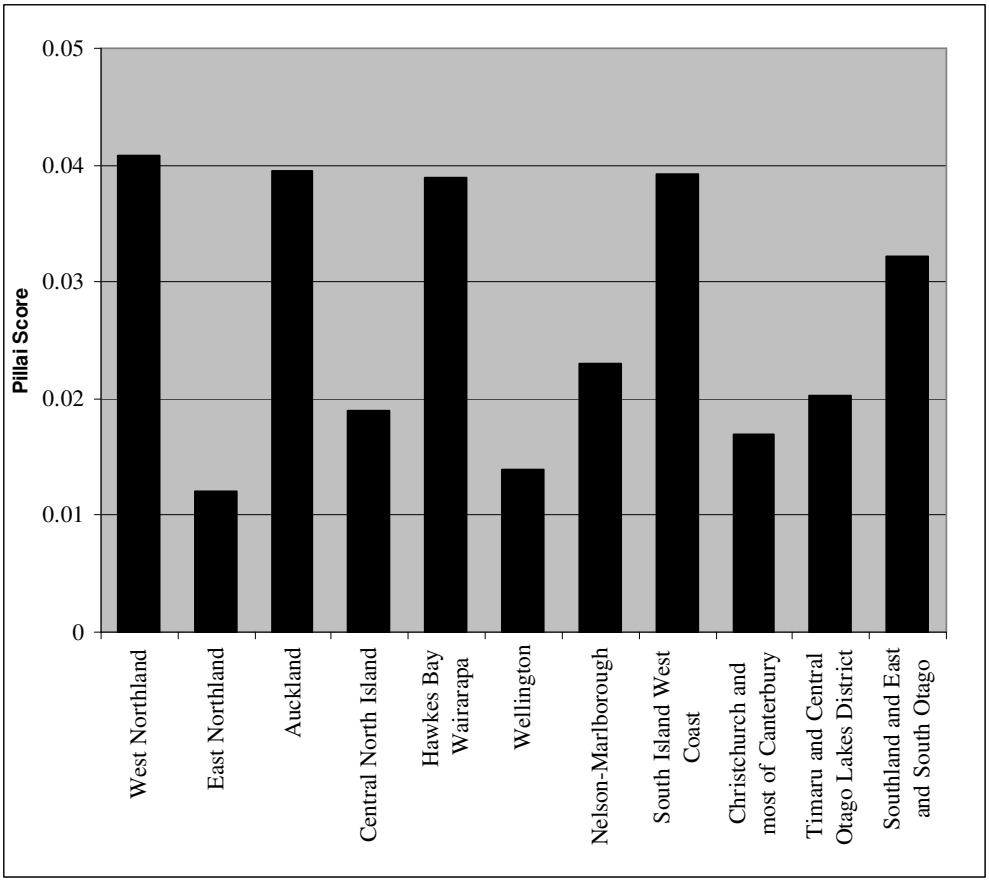


Figure 5.4: Pillai scores for the distance between distributions of pre-lateral FOOT and GOOSE by region.

Returning to the issue of significance discussed above, none of the Pillai scores presented in Figure 5.4 reach significance level. This means that no group of speakers reliably separate pre-lateral FOOT and THOUGHT in the data presented here.

By contrast, the distributions of non-pre-lateral FOOT and THOUGHT are significantly separated for nine of 11 subregions (both sets of results and their significance levels are recorded in Table 0.9, Appendix C).

This study does not record length information for pre-lateral FOOT and THOUGHT; this is prohibitively difficult to measure in running speech. Subsequent research could consider whether pre-lateral FOOT and THOUGHT remain distinguished by length among speakers for whom the sounds are qualitatively similar: impressionistic analyses of the data set are inconclusive (there are contrastive examples of *bullrush* and *ballrush* on the accompanying CD).

5.2.4. Vowel neutralisation and /l/ vocalisation: an extended aside

/l/ vocalisation is another sound change in NZE which has the potential to influence pre-lateral vowel neutralisation in the variety. It is unlikely that the distribution of vocalised /l/ had an effect on the results presented above, but an investigation into the role of /l/ vocalisation in vowel neutralisation has some interesting findings.

Vocalised /l/ has a number of allophonic realisations in NZE, including [ɯ], [ɤ] and [ʉ], and may form a diphthong or disyllabic sequence with the preceding vowel (Bauer & Warren 2004: 585). Horvath and Horvath (2001: 40) put the level of /l/ vocalisation in NZE at between 46 percent and 51 percent for reading list data, depending on location. This is almost certainly a conservative estimate for the data set used in the current research, both because of the young participants – /l/ vocalisation is a change in progress – and the informal character of the interview data. It is difficult to accurately identify /l/ vocalisation, but my attempts to classify the data for this section as 'clearly vocalised', 'unclear' and 'not vocalised' found that 84 percent of all syllable-coda /l/s were clearly vocalised, nine percent unclear and just seven percent not vocalised.

The effect, if any, of /l/ vocalisation on vowel neutralisation is unknown. Thomas (2004: 83) compared DRESS and TRAP neutralisation before /l/ in monosyllabic and disyllabic nonsense words, with the assumption that the monosyllabic data set would have a large proportion of vocalised /l/ (though this was not explicitly

measured). Thomas' results do not show a clear difference between the two data sets. Depending on the initial consonant, the data in either condition variably had higher F1 or F2, and he makes no attempt to further interpret the discrepancies.

An alternative but not incompatible view is put forward by Johnson and Britain (forthcoming). Their discussion of /l/ vocalisation touches only briefly on vowel neutralisations (both of quality and length), but makes an interesting claim: "we consider that this shortening/neutralisation will not occur until vocalisation levels are very high." Johnson and Britain cite examples of English varieties with frequent /l/ vocalisation and vowel neutralisation before /l/, and one example of a variety with frequent /l/ vocalisation and no evidence of neutralisation. They conclude that "[w]ell entrenched vocalisation appears therefore to be a prerequisite for shortening [/neutralisation] but does not guarantee it will take place" (Johnson & Britain forthcoming).

It is unclear from this account whether the authors consider that vowel neutralisation will appear only in the context of particular instances of /l/ vocalisation or if it might emerge system-wide once /l/ vocalisation reaches a critical level in a variety. Thomas' (2004) results suggest that the latter is the case for the merger of DRESS and TRAP in NZE: his data has evidence of neutralisation in contexts where /l/ vocalisation does not occur. However, it seems logical to theorize a progression from the former to the latter.

Given the high levels of /l/ vocalisation presented above for the children in this study, it is difficult to make a meaningful contribution to this discussion. Figure 5.5 is an attempt to do so, and compares FOOT and THOUGHT realisations before consonantal /l/, both heterosyllabic and tautosyllabic, with the same phonemes before clearly vocalised /l/ allophones. There appears to be more ellipsis overlap for the vowel tokens preceding vocalised /l/ than for tokens followed by consonantal /l/. This claim has support from Pillai scores of the distances between the two sets of ellipses: FOOT and THOUGHT before consonantal /l/ are significantly different ($p=0.008$) from one another with a Pillai score of 0.215, while the distributions of tokens before vocalised /l/ are not significantly different ($p=0.192$) with a Pillai score

of 0.014. This result is once again limited by mismatched data sets: just 17 tokens of FOOT and 26 of THOUGHT were recorded before consonantal /l/, while 103 FOOT tokens and 140 THOUGHT tokens were recorded before the clearly vocalised variant. Nevertheless, it is possible that this data exhibits an earlier stage of vowel neutralisation before /l/, where /l/ vocalisation is acting as a precondition.

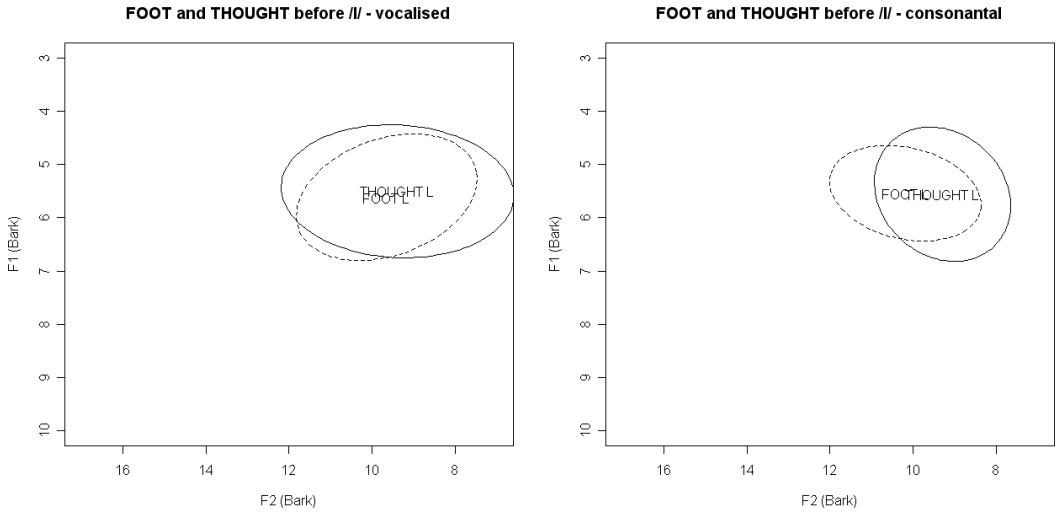


Figure 5.5: Vowel ellipses for FOOT (solid line) and THOUGHT (dotted line) before vocalised /l/ (left) and before consonantal /l/ (right).

5.2.5. Summary and discussion

There is little evidence of social variation in this data set, but it is still valuable as empirical evidence of a pre-lateral FOOT and THOUGHT merger in NZE. Again, the recorded data is probably unsuitable for revealing more detailed variation.

Section 5.2.4 outlines a possible role of /l/ vocalisation in pre-lateral vowel neutralisations. This is unlikely to be a factor affecting potential social or regional variation in the data set, but would be an interesting topic for future research.

Sound files for FOOT and THOUGHT before /l/

Sound 30: Pre-lateral FOOT, pre-lateral THOUGHT, School 19 (Lower Hutt).

A: b-u-l-l-r-u-s-h
Int: Yeah, everybody agree?
B: **Bullrush** or **Ballrush**…
C: Yeah it's **bull**, **bullrush**, **bullrush** I reckon
A: Oh yeah, b-a-l-l-r-u-s-h **ballrush**
C: What? Oh like **ballrush**?
A: Yeah
B: Yeah
C: They both sound the same

Sound 31: Pre-lateral FOOT, pre-lateral THOUGHT, School 32 (Gore). "Bullrush you sort of run and the **ballrush** um you stand in a circle and you throw the **ball** in." A student explaining how to distinguish between the games bullrush and ballrush.

Chapter 6: Lexical and miscellaneous features

This chapter presents a series of brief investigations into isolated features whose pronunciation is known to vary in NZE. The individual data sets are generally too small to reveal much about items' regional or social distribution, but the results offer some further insight into variation in modern NZE.

6.1. (a) before vowels

English speakers traditionally use the indefinite article *an* before vowels, as in *an elephant,* but *a* before consonants, as in *a gorilla.* During transcription, I noted a number of examples of speakers using *a* before a vowel: *a elephant.*

This innovation is analogous to one studied by Anderson et al (2004), who found that young NZE speakers can use a reduced form of *the* [ðə] before vowels, where this variant is traditionally restricted to pre-consonantal contexts. I have been unable to identify any research on *a/an* variation before vowels, in any variety of English.

There were 94 tokens of an indefinite article before a vowel in the corpus (see Table 0.10, Appendix D). Of these, 35 (37%) were realised as *a* rather than *an.* The innovative variants are well distributed, with examples from all but seven schools in the data set. Some speakers insert a glottal stop between *a* and its following vowel, as in Sound 33.

Sound 32: Pre-vocalic *a* token, School 1 (Kaitaia). "Can I have **a apple**?"

Sound 33: Pre-vocalic *a* token, with glottal stop, School 23 (Westport). "My little brother's **a Indian** giver."

6.2. *either*

Either has two standard English pronunciations: /aⁱðə(r)/, which is more frequent in British English, and /iðə(r)/, which is more frequent in American English (Upton, Kretzschmar & Konopka 2001), though this source records both pronunciations for both varieties. *The New Zealand Oxford Dictionary* (Kennedy & Deverson 2005) also records both pronunciations, but favours the British variant.

There are just 34 tokens of *either* in the total corpus for this study[15] (see Table 0.11, Appendix D). Interestingly, these are exactly divided between the two pronunciations, with 17 tokens of each. We can only conclude that there is indeed variation for this item in NZE.

Sound 34: Token of /iðə/, School 28 (Timaru). "They wouldn't kick it on accident **either**." A student asked about bleeding noses from balls in the playground.

Sound 35: Token of /aⁱðə/, School 31 (Dunedin). "They can **either** call octopus and then everyone runs…" A student explaining the game octopus.

6.3. *says*

The verb *say* /sæⁱ/ has an irregular third person present pronunciation, /sez/, in standard accounts of British and American Englishes (Upton, Kretzschmar & Konopka 2001), as well as in standard NZE (Kennedy & Deverson 2005). In contemporary NZE, however, some speakers have apparently regularised the pronunciation of *says* to form the innovative pronunciation /sæⁱz/. I have not been able to find reports of this alternation outside of New Zealand, including in Wright's (1905) *English Dialect Dictionary*.

There are 109 tokens of *says* in the corpus, from 29 schools (see Table 0.12, Appendix D). The innovative pronunciation, /sæⁱz/, is most frequent, used in 65 (60%) of

[15] There are also seven tokens of *neither* in the data set: too few for meaningful analysis.

tokens. The innovative variant is also better distributed across the data set, with all 29 schools providing examples, as against 17 schools for the more conservative pronunciation. Patterns of distribution are not obvious in the data set, though there is probably insufficient data for these to emerge.

Sound 36: Token of /sez/, School 2 (Kaikohe). "And when he **says** dinner time you got to run like hell." A student explaining the game 'what's the time mister wolf'.

Sound 37: Token of /sæᶦz/, School 23 (Westport). "…the person **says** dinner time…" As above.

6.4. *Final /k/ epenthesis in* anything, everything, nothing *and* something

6.4.1. Literature review

Gordon (1998) notes that NZE speakers sometimes pronounce *something, anything, nothing* and *everything* with an epenthetic final /k/, for example [sʌmθɪŋk]. The feature was used by children at Gordon's primary school in the late 1940s so is not a recent innovation in NZE, though I am not aware of any empirical studies documenting its use. Gordon cites an Australian study (Shnukal 1978, cited in Gordon 1998) which found that the [-ɪŋk] variant is more common in the speech of younger, working class informants.

Epenthetic final /k/ can probably be described as an age-graded variant: one that decreases as speakers become older. Gordon's (1998) account focuses on its use by young people, noting the "wonderfully subversive nature of children's discourse" and describing final /k/ use as strongly stigmatised.

The data presented here can make no comment about the use of epenthetic final /k/ among different age groups. However, it seemed useful to collect data on this feature, given that all relevant tokens were already isolated in the TH-fronting data set. The social stigma accorded to epenthetic final /k/ (and TH-fronting) also

provides an interesting contrast to other features examined in this thesis, particularly the apparent prestige of rhotic NURSE (Bartlett 2002: 142, Gibson 2005). This is certainly a relevant factor when considering the potential for these variables to become markers of regional dialects in NZE (see Section 7.6.2).

6.4.2. Methodology

Analysis for epenthetic final /k/ was auditory and binary: the variant was coded present or absent. Eighty nine percent of relevant tokens are in the lexical item *something*, so it is not possible to compare the four lexical items.

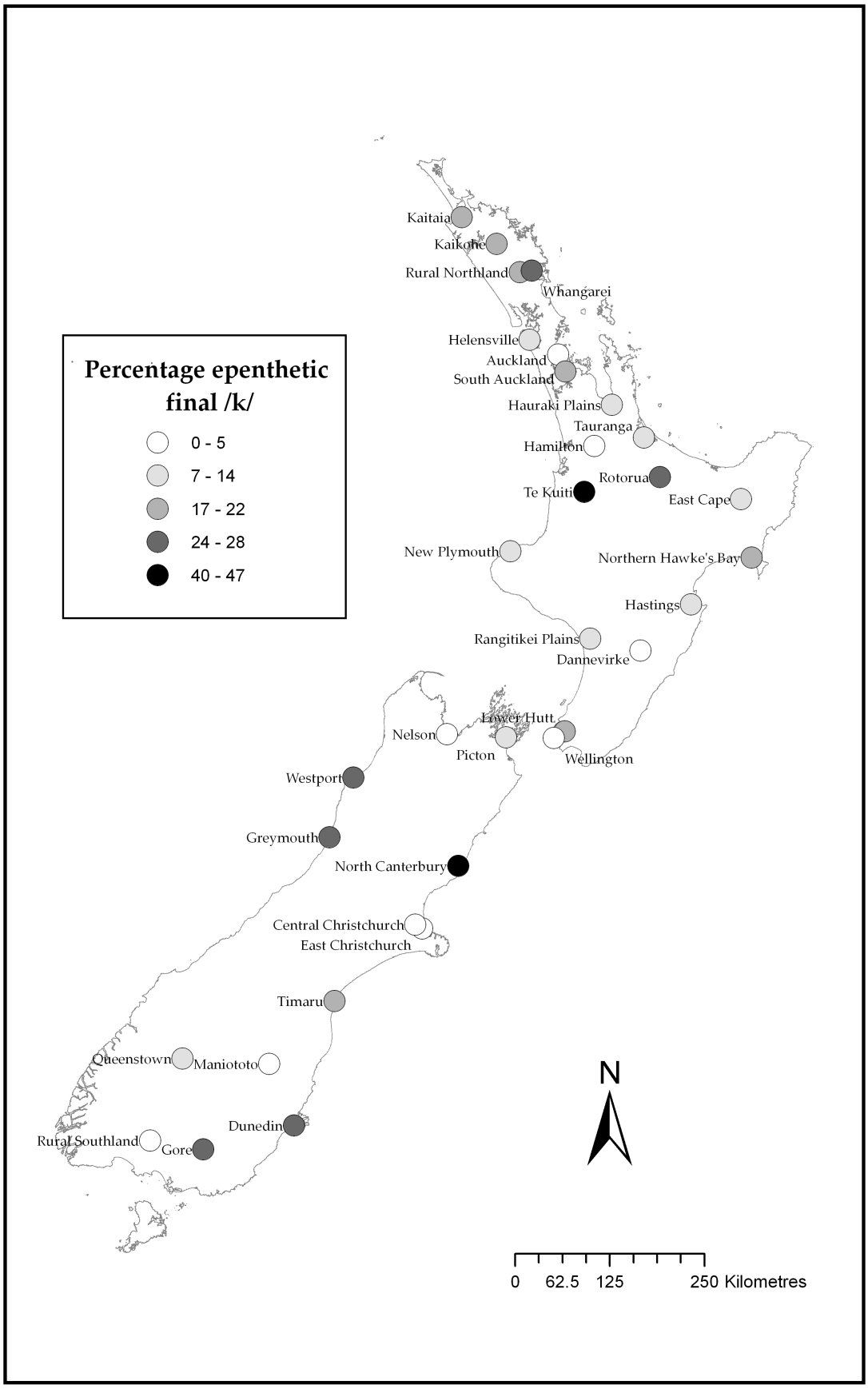
The CART analysis presented below includes all of the social factors set out in Section 2.3.2. It also takes into account whether the {-thing} morpheme is utterance final, precedes a vowel or precedes a consonant. The epenthetic final /k/ could function as a syllable onset (analogous with linking /r/) before a vowel, so is more likely in that context.

The data set for epenthetic final /k/ consists of 799 tokens, with between nine and 47 tokens from each school (see Table 0.13, Appendix D).

6.4.3. Results

According to the data presented here, the best predictor for epenthetic final /k/ is indeed its following sound: a following vowel favours /k/ realisation. No social variable is a strong predictor of epenthetic final /k/, however ethnicity may have some influence.

Thirteen percent of {-thing} items in the corpus are pronounced with an epenthetic /k/. Map 7 shows the distribution of this variable for all schools. There are seven schools in the two groups with the highest frequencies of epenthetic final /k/. These schools have little in common, as demonstrated in Table 6.1. They represent all deciles – middle decile schools are most common, both islands, and vary from three to 52 percent Māori students.



Map 7: Regional distribution of epenthetic final /k/ in {-thing} items.

Table 6.1: Classifications of seven schools with high levels of epenthetic final /k/ in {-thing} items.

School number	General Location	Island	Region	Subregion	Decile	Percentage Māori students
3	Whangarei	North	Northern	East Northland	Low	35
11	Rotorua	North	Northern	Central North Island	Middle	38
12	Te Kuiti	North	Northern	Central North Island	Low	52
23	Westport	South	Central	South Island West Coast	Middle	11
24	Greymouth	South	Central	South Island West Coast	Middle	7
25	North Canterbury	South	Central	Christchurch and most of Canterbury	Middle	12
31	Dunedin	South	Southern	Southland and East and South Otago	High	3
32	Gore	South	Southern	Southland and East and South Otago	Middle	10

The schools with the highest proportions of Māori students do not appear in the group with higher frequencies of epenthetic final /k/. This may explain why ethnicity is also the only social variable to factor in the CART analysis presented in Figure 6.1. It appears that high Māori student populations disfavour the variant.

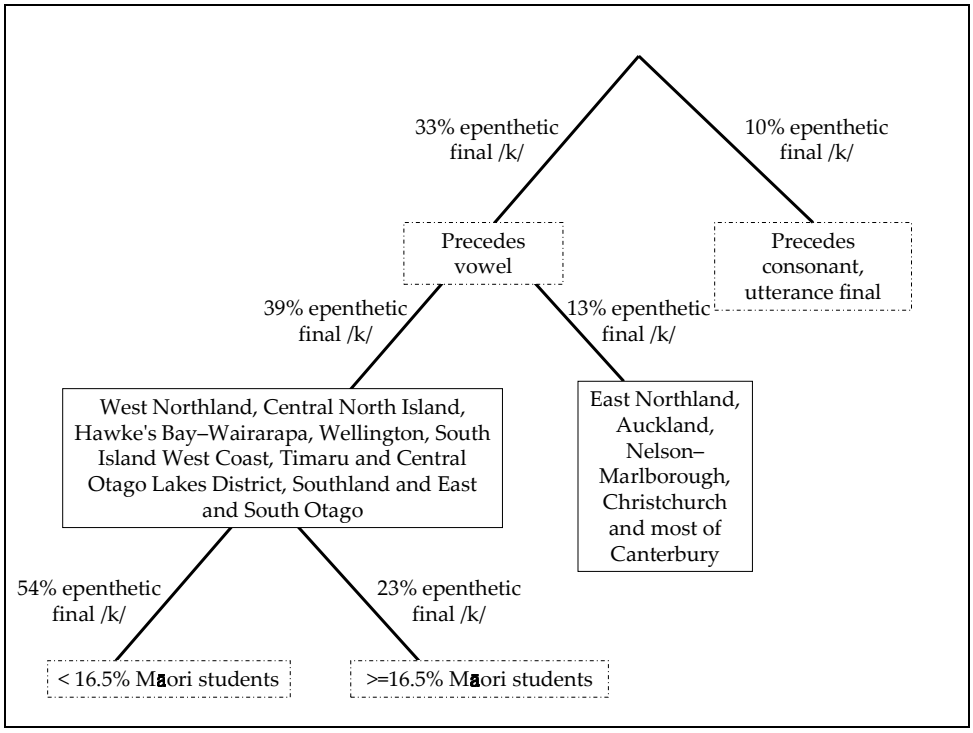


Figure 6.1: CART regression analysis of regional, social and linguistic factors in the realisation of epenthetic final /k/ in {-thing} items.

Subregion is not a clear factor in epenthetic final /k/ realisation, though it too appears in the CART analysis. The two groups of subregions identified here are geographically disparate, with North and South Island subregions equally represented in both. On this occasion it would have been particularly interesting to compare individual speakers, had time permitted. During transcription it seemed that one or two students were often responsible for all of a school's epenthetic /k/ pronunciations. If this data were reliant on individuals, that could be one reason for its largely unexplained variability.

Sound 38: Epenthetic final /k/ token, School 16 (Hastings). "She bought it 'cause it's raining and you can't do **anything** outside."

Sound 39: Epenthetic final /k/ token, School 18 (Dannevirke). "Just **something** extraordinary." A student explaining the usage of *far out*.

6.5. <wh>

A distinction between the pronunciation of <wh> and <w> is often said to have been retained longer in NZE than in other varieties, and in Southland English more than in other New Zealand regions (Gordon & Maclagan 2004: 42). We would not expect young NZE speakers to retain this distinction, however, and this is true for the school children recorded here. The data set contains just one token of contrasted <wh> from a possible 1473 environments, and this is from Greymouth on the South Island's West Coast rather than Southland.

The contrasted <wh> appears to be used for emphasis in this example, so may still be available as a stylistic device for young NZE speakers.

Sound 40: Contrasted <wh> token, School 24 (Greymouth). "What's pingers?"

Chapter 7: General Discussion

This chapter assesses patterns in the results presented in this thesis. It looks at linguistic variation linked to region, socio-economic class and ethnicity for the young NZE speakers surveyed. In particular, it discusses evidence for interaction between socio-economic class and regional variation, and between ethnicity and regional variation. Later sections in this chapter examine other potential factors in NZE regional dialect formation: external borrowing, stigmatised and prestigious variants, and geographic isolation. A number of variables do not show evidence of regional or social variation for this data set, but nonetheless exhibit linguistic variation. These are briefly summarised, and some of the linguistic influences encountered during the study are outlined. The final sections discuss the limitations of this research and some opportunities for future research into NZE dialect formation.

7.1. Regional variation

Two linguistic variables examined in this study are better explained by speakers' location than by any other social factors considered here. These are Otago-Southland rhotic NURSE and *with* voicing. This section examines the patterns of regional variation exhibited by these variables, particularly in response to the regional dialect areas proposed by Bauer and Bauer (2003).

Though rhotic NURSE was predicted in the speech of young Southlanders, the extent of the rhotic area indicated by this research is larger than expected. In addition to frequent rhotic NURSE at schools in Gore and Rural Southland, there is evidence of rhoticity both in the city of Dunedin and in Queenstown and Maniototo in Central Otago, all of which border Southland to the north. Rhotic NURSE is less frequent in the three Otago data sets, which suggests that Dunedin, Queenstown and Maniototo are currently at the periphery of the South Island's rhotic area.

The data set does not reveal whether rhotic NURSE is a new innovation outside of Southland's provincial borders or has simply remained undetected in earlier studies of the variant. Previous discussions of Southland English appear to equate the dialect's boundary with the political borders of the Southland province, if only by choosing 'Southland English' as its label. Gordon et al (2004: 175) have tracked non-pre-vocalic /r/ loss in early NZE and they locate the modern dialect in "Southland and parts of Otago" but do not elaborate. This may be a reference to Bartlett's (1992) anecdotal reports of rhoticity in Balclutha and Milton, both towns in South Otago. Bayard (1995: 108) reports that Southlanders studying in Dunedin claim to "get rid of their rs" on arrival, clearly indicating that they do not consider rhoticity a part of the local variety.

The findings for NURSE rhoticity provide some support for Bauer and Bauer's (2003) proposed regional dialect boundaries in NZE. Their Southern Region includes Southland and East and South Otago, the latter encompassing Dunedin and Maniototo. The data set presented here supports the possibility of a regional dialect boundary beyond Southland's provincial borders, but suggests that the Southern Region may stretch further into Central Otago than Bauer and Bauer's research indicates. Their data groups Queenstown speakers with speakers from Timaru in South Canterbury.

Regional variation has not previously been reported for pronunciations of *with* in NZE, so the patterns that have emerged are very exciting. Unlike NURSE rhoticity, which is largely restricted to two distinct areas of New Zealand, results for *with* voicing suggest a nationwide transition from speakers in the South Island who favour a voiceless segment, through a central region tending towards voiced <th>, to speakers who most frequently voice the segment in the north of the North Island.

Again it is interesting to discuss these results in the context of Bauer and Bauer's (2003) proposed dialect boundaries. The *with* data set was grouped into Bauer and Bauer's subregions for analysis, so this discussion can only consider potential support for their three main regions (outlined in Section 1.3). Some of the findings do appear to support the results of the earlier study. The group in the north of the

North Island that most strongly favours voiced *with* corresponds exactly to Bauer and Bauer's Northern Region. Bauer and Bauer (2003: 9) found that the boundary between their Central and Northern Regions is statistically better supported than the corresponding Central-Southern Region boundary, and the results presented here strengthen that claim. Like Bauer and Bauer's findings, the results for *with* also indicate that Cook Strait, between the North and South Islands, is not a clear dialect boundary for NZE. Nelson–Marlborough schools in the South Island have similar results to schools in the lower North Island for their speakers' distribution of *with* variants. There is little sign of a distinctive Southern or Southland-Otago dialect area in the *with* data set. A considerably larger body of data would be very useful to substantiate all of these claims.

It is possible to link the regional distributions of both rhotic NURSE and *with* voicing to historical British settlement in New Zealand. Standard accounts of Southland English attribute its rhoticity to the large proportion of Scottish migrants who settled in the province (e.g. Gordon & Maclagan 2004: 605). Scottish migrants are also likely to have pronounced *with* as /wɪθ/, while settlers from Southern England, a majority outside of Otago and Southland (Gordon & Maclagan 2004: 604), probably favoured /wɪð/ (Jones 1960: 184). The results presented here suggest that the voiceless pronunciation is indeed more common in the southern regions of New Zealand, though its distribution stretches well beyond the borders of Otago and Southland. *With* voicing is almost certainly under the level of consciousness for most NZE speakers, and this may have affected its wider distribution in the variety.

There are two particular consequences if we propose influence from British settlement patterns for both Otago-Southland NURSE rhoticity and *with* voicing. Firstly, both features become examples of variation originally linked to ethnicity which must now be reinterpreted as regional variation (this is the idea presented in Section 1.5). Secondly, nineteenth century links for both these features leave no definite examples of regional variation arising or increasing in contemporary NZE. It is possible that NURSE rhoticity is becoming more frequent for young Otago speakers, but there is insufficient data to clearly substantiate this claim. This

contrasts with reports of Australian English, which suggest that regional variation in Australia is a recent and continuing development (e.g. Bradley 2004). The sections that follow present evidence indicating that new forms of regional variation may however be in the process of emerging in NZE, all associated with forms of social variation. It is these innovations, and not the older features presented in this section, that potentially represent early stages in the process of regional dialect formation in colonial Englishes described by Bauer and Bauer (2002a, cf Section 1.2).

7.2. Variation linked to ethnicity

The distributions of four features appear to be associated with Māori and Pasifika ethnicities at participating schools. This section compares the role of ethnicity in each variable's distribution, and also examines potential differences between Māori students and Pasifika students in the data set. Because New Zealanders of Māori and Pasifika descent are concentrated in the North Island of New Zealand, there is considerable interaction with regional variation for these features (this is discussed separately in Section 7.3).

Linking /r/ is significantly less frequent in recordings from schools with high Māori or Pasifika student populations. Perhaps the most useful way to interpret this finding is as support for the study's methodology: assigning a single measure of ethnicity to a school's data set can still reveal expected forms of variation.

Ethnicity interacts with both socio-economic class and region as factors in the distribution of linking /r/.This variation has two potential sources, which perhaps accounts for its complex distribution. An absence of linking /r/ is a possible substratum feature from te reo Māori, so this may promote linking /r/ loss at schools with high Māori populations. Additionally, linking /r/ is a conservative feature in NZE (Sudbury & Hay 2005), which likely promotes high frequencies of the variant at high decile schools. As ethnicity and socio-economic class are highly correlated in the data set, both are possible explanations for the distribution of linking /r/ reported here.

There is a quite different pattern of variation in North Island NURSE rhoticity. Ethnicity is statistically a predictor of rhotic NURSE at North Island schools, but its distribution among schools with high Māori populations is also highly localised (the regional factor in North Island NURSE rhoticity is discussed in Section 7.3). At schools with evidence of rhoticity the frequency of rhotic NURSE appears to correlate with the proportion of Māori or Pasifika students at each school: the highest frequencies are at two schools where the Education Review Office records more than 80 percent Māori students. This correlation indicates that ethnicity is a central factor explaining North Island NURSE rhoticity.

Taken together, the findings for linking /r/ and rhotic NURSE point to diverging trends for /r/ realisation by Māori and Pasifika speakers. Compared to speakers at predominantly Pākehā schools, Māori and Pasifika speakers appear to use fewer /r/ variants in a linking context, yet more frequent /r/ variants in nuclear stress position. This suggests separate sources for the two features: unlike linking /r/, rhotic NURSE is not likely to be a substratum feature from te reo Māori (possible sources for rhotic NURSE are addressed in Section 7.6.1). There may be a more complicated relationship between the two variables for individual speakers or speech communities; the data set is not sufficiently detailed to address this possibility.

Though Māori English dominates discussions of linguistic variation attributed to ethnicity in NZE, speakers with Pasifika heritage are increasingly drawing the attention of linguists. The results of this study suggest that Māori and Pasifika speakers share several linguistic characteristics that set them apart from Pākehā English speakers. They also suggests that linguistic characteristics can differentiate Māori English speakers from Pasifika English speakers. For both rhotic NURSE and linking /r/, the data set's sole school with a Pasifika majority has similar distributions to schools with high Māori populations. For TH-fronting, however, students at the Pasifika-majority school have the highest frequency of the fronted variants in the data set, while the percentage of Māori students at each school does not emerge as a significant factor. This supports findings by Starks and Reffell (in prep), who note "exceptionally" low levels of TH-fronting among Māori students

when compared to Pasifika students. Again, there may also be a regional element in this feature's distribution, which is examined in the following section.

There is one further feature included in the study with possible links to participant ethnicity: final /k/ epenthesis in {-thing} items is less frequent at schools with high Māori populations (the influence for Pasifika speakers is unclear).

The findings reported in this section suggest that Māori and Pasifika populations are a key factor explaining linguistic variation among the young speakers surveyed for this research.

7.3. Ethnicity and regional variation

Ethnicity and region interact as factors explaining linguistic variation in the data set. Two separate patterns can be identified. In one, exemplified by rhotic NURSE, the innovative variant is largely restricted to a particular region, though ethnicity data would predict that it would also be found elsewhere. In the second, illustrated by linking /r/ and TH-fronting, the innovative variants are more widely distributed than ethnicity figures would predict. The latter finding suggests that linguistic innovations attributed to ethnicity may be beginning to emerge at schools which themselves have predominantly Pākehā students, but which are located in regions with relatively high Māori or Pasifika populations.

Statistical analyses for rhotic NURSE outside of Otago and Southland suggest that ethnicity is a primary factor in the variant's distribution. In effect, however, rhotic NURSE is restricted to four Northland schools in the data set, along with one school in South Auckland. These schools all have relatively large Māori populations (or Pasifika in the case of the South Auckland school), ranging from 29 percent to 92 percent of their total enrolments. There are, however, six further schools with Māori enrolments within this range – located in the Central North Island, East Cape, Hawke's Bay, and as far south as Picton – none of whose pupils appear to rhotacise the vowel. Both region and ethnicity are required to explain these findings, which is perhaps best described as regional variation within Māori and Pasifika Englishes.

Returning to the dialect regions proposed by Bauer and Bauer (2003), it is interesting to note that the two Northland schools with the highest frequencies of rhotic NURSE also constitute Bauer and Bauer's West Northland subregion. Their study found significant vocabulary differences between participating schools in West Northland and East Northland. There is no way to evaluate the relative importance of ethnicity and the proposed dialect boundary using the available data, but either would satisfactorily explain the documented variation. It is also possible that ethnicity is the source of Bauer and Bauer's dialect division: West Northland schools have some of the highest Māori populations in the data set. Bauer and Bauer do not specifically discuss Māori populations at schools participating in their research.

The second pattern of variation described above, wider distribution than predicted by ethnicity data, is exemplified most clearly by findings for TH-fronting. The highest frequency of TH-fronting is recorded at the data set's Pasifika-majority school in South Auckland. Fronted variants are also significantly more frequent for students at two other schools in the data set, however neither have notable Pasifika student numbers. Importantly, both of these schools are within 150 kilometres of South Auckland. This suggests that TH-fronting could be becoming a dialect feature of the Auckland region, with Pasifika populations a catalyst for the innovation.

Additional factors also appear to influence <th> realisations across the data set. Socio-economic class is identified as a possible factor, and, because TH-fronting is relatively salient for many NZE speakers, this interacts with issues of linguistic prestige. These factors are discussed in Sections 7.4 and 7.6.2 respectively; both are compatible with the interpretation offered here.

A similar case for regional variation emerging from ethnicity-related variation is possible for the distribution of linking /r/ in the data set. (In this instance, a separate argument is possible for linking regional effects to social class; this is set out in Section 7.5.) According to the findings presented in Chapter 3, linking /r/ is less frequent for speakers at low decile schools with high Māori populations (these characteristics are highly correlated in the data set). However, among high and

middle decile schools, linking /r/ is also less frequent for speakers in Auckland and Hawke's Bay–Wairarapa. One possibility is that Māori populations provide the catalyst for the feature's distribution in these subregions. Absence of linking /r/ is a possible substratum feature of Māori English, and both Auckland and Hawke's Bay–Wairarapa have proportionally high Māori populations, particularly when compared to regions in the South Island (Statistics NZ 2004). This interpretation suggests, therefore, that non-Māori students at middle and high decile schools (these features, too, are highly correlated) are demonstrating linking /r/ distributions typical for Māori English speakers, but only in regions where there are substantial Māori populations. This effect, if it is valid, is relatively weak for the data set presented here: East Northland and the Central North Island are not identified in the relevant statistical analysis, and these too have high Māori populations relative to other subregions in the data set.

The patterns of variation described in this section indicate that ethnicity is a likely source for regional variation in NZE.

7.4. Variation linked to socio-economic class

Previous studies have documented socio-economic class variation in NZE for many of the features analysed as part of this research. Unfortunately the socio-economic class indicator available for the data set, schools' decile ratings, is imprecise, so only the strongest effects could be expected to emerge. Nonetheless, there is evidence of socio-economic class variation for two linguistic features, TH-fronting and linking /r/, which provides some support for relying on decile ratings in this capacity. Neither feature's distribution, however, is solely explained by socio-economic class: both are linked to ethnicity and potential regional variation in the data set. This section summarises the influence of socio-economic class on the two variables' distributions (potential interactions with regional variation are discussed in Section 7.5).

TH-fronting is significantly more frequent at low and middle decile schools than at high decile schools in the data set. This supports previous research on the variant in

NZE (Campbell & Gordon 1996). Campbell and Gordon's (1996) findings suggest that the innovative <th> variants are stigmatised in NZE. This is closely related to their socio-economic class variation, and a point I revisit in Section 7.6.2.

There are no previous findings with which to compare socio-economic class variation for linking /r/ in contemporary NZE. The results for this research indicate that linking /r/ is less frequent at low decile schools in the data set, but, as noted above, this is closely correlated with high Māori populations at these schools. Hay and Sudbury's (2005) study of linking /r/ in early NZE suggests that frequent linking /r/ is conservative for NZE speakers, and this is reflected in the high frequencies of linking /r/ at high and middle decile schools in the data set, and particularly in the South Island.

Socio-economic class is another factor that appears to account for variation among the New Zealand school children surveyed for this research.

7.5. Socio-economic class and regional variation

This section discusses two examples of socio-economic class interacting with region as explanations for variation in the data set. Unlike ethnicity, which is a possible source for many of the variables discussed in this research, socio-economic class appears to constrain potential linguistic innovations in NZE: students at high decile schools favour conservative variants for all relevant features.

Again, the results for linking /r/ exemplify this pattern of variation. According to the data presented on Map 4, linking /r/ is particularly frequent at a number of South Island schools in the data set, all but three of which are high and middle decile. This factor, coupled with low Māori populations in the South Island, could strengthen apparent linking /r/ variation between South Island schools and others in the data set.

Socio-economic class also appears to constrain regional variation in the TH-fronting data set. Fronted <th> is most frequent at three schools in the Auckland region, all low and middle decile, but not at a fourth Auckland school with a high decile

rating. For TH-fronting, socio-economic class has had the opposite effect to that described for ethnicity. Pasifika populations are put forward as a potential catalyst for the Auckland-centred variation, however their influence does not appear to extend to speakers at high decile schools in the region.

This section has described one possible role of socio-economic class in emerging NZE regional variation. In these examples, feature distributions at higher decile schools appear to both contrast with and constrain potential regional innovations in the data set.

7.6. Non-demographic social factors in variation

This section describes three non-demographic factors that also appear to contribute to the linguistic variation described in this research. None have been statistically explored, but serve to highlight some of the many complexities involved in NZE sound change and potential dialect formation.

7.6.1. Borrowing

It is my experience that non-linguists often attribute change in NZE to American influence, particularly for young people. According to Gordon and Deverson (1998: 114) these opinions are not new: "Complaints about American English infiltrating this country have been voiced since at least the beginning of [last] century." Both vocabulary and pronunciation are cited in this connection, so that Bayard (1995: 206) reports more frequent pronunciations of *Z* as /zi/ rather than British English /zed/, and *clerk* as /klɜk/ rather than /klak/.

This thesis has presented two claims of American English influence on NZE: in the lexical item *weiner* and as an explanation for rhotic NURSE in the North Island. This is a separate phenomenon to Bayard's examples above. In both *Z* and *clerk* the American pronunciations use phonemes already found in all varieties of NZE, but this does not apply to rhotic realisations of NURSE and letter.

As it happens, there is little evidence of rhotic *weiner* in the children's speech (see Section 3.3), but rhotic NURSE is more difficult to evaluate. The argument for

American influence attributes North Island NURSE rhoticity to a strong hip hop culture among Māori and Pasifika New Zealanders, with the rhotic variant possibly adopted via New Zealand hip hop recordings (Gibson 2005). A caveat in this argument is that it does not explain why the highest frequencies of rhotic NURSE are found in rural areas of Northland and not in Auckland's urban area where we might expect hip hop music to have its greatest influence. We would need to know more about hip hop culture among residents of Kaitaia and Kaikohe to properly evaluate this claim.

In my view, the process of innovation within peer groups described in Section 1.4 is the mostly likely source of NURSE rhoticity in Northland and South Auckland. In that scenario, a well-liked speaker adopts a particular variant, which then becomes standard for others in their peer group and, later, their community. The ultimate source of the variant is relatively unimportant, as its distribution primarily develops within the new speech community. This process could account for both regional and linguistic restrictions on NURSE rhoticity among North Island speakers in the data set.

7.6.2. Stigma and prestige

It is well established in sociolinguistic discourse that stigma or prestige attached to a linguistic variable can affect its distribution in a variety. A feature is often described as having 'overt prestige', where it is considered desirable by a dominant social group, or 'covert prestige', where it functions as an in-group marker among less powerful social groups (Trudgill 1972).These concepts are useful in explaining aspects of the variation found in this research.

Both covert prestige and stigma are possible factors in the distribution of TH-fronting in the data set. TH-fronting is generally more frequent among speakers at low decile schools, so unlikely to be overtly prestigious for NZE speakers, however Pasifika students in South Auckland and students at two other schools in that region use the variant more frequently than others of similar socio-economic class. This suggests that fronted <th> has covert prestige among Pasifika students and other speakers living near Pasifika populations. TH-fronting is also a feature of the

variety used by Pasifika characters on the cartoon *bro'Town* (Andy Gibson p.c.) which may reinforce its status as a marker of Pasifika English (although this cartoon was not broadcasting when the interviews were conducted). TH-fronting is not frequent at high decile schools in the data set, including one in Auckland, which suggests that the variant may be stigmatised for these speakers.

The attitudinal status of rhotic NURSE for Otago and Southland speakers is more difficult to evaluate. As cited above, Bartlett (1992) has suggested that NURSE rhoticity has covert prestige among young speakers in the Southland province itself. The results of this study confirm that the variant remains frequent for young Southlanders. Bayard (1995: 108), however, has spoken with Southlanders in Dunedin who believe that rhoticity is stigmatised in the local variety and who avoid using rhotic variants. The wider than expected distribution of NURSE rhoticity in this data set indicates that Bayard's comments may not be representative of the young speakers surveyed in this research. It is possible that rhoticity has gained wider prestige as an identity marker for lower South Island speakers. This is clearly a topic for continued study (see Section 7.10).

7.6.3. Geographic isolation

Geographic isolation is analogous to Bauer and Bauer's discussion of rural and urban schools in their study. Bauer and Bauer (2003: 64) found that a number of items, particularly Americanisms and TV-related items, tend to be more common for urban children than rural children. (The terms 'urban' and 'rural' are defined by the number of schools in a settlement.)

Schools' rural/urban status was included in the factor analyses presented in the previous chapters, but did not emerge as significant for any of the variables. It is likely that the binary division is too broad to capture the patterns shown in the pronunciation data sets. However, for at least one data set, rhotic NURSE, it appears that speakers' isolation is still a factor in its distribution. In the findings for both the North Island and for Otago and Southland, the highest frequencies of NURSE rhoticity are found at the most isolated and often the least populated areas. Frequencies of NURSE rhoticity decrease at schools further north in the South Island

and further south in the North Island. Importantly, however, attributing rhotic NURSE in the North Island to both isolation and ethnicity describes only part the results presented here. A participating school in the North Island's East Cape has a high number of Māori students and is notably isolated, yet there is no evidence of rhoticity among its students. 'Geographic isolation' is a useful term for these interesting findings.

7.7. Variation without evidence of social or regional distribution

Some of the features investigated as part of this research show no patterns of social or regional variation. (All are variable, however, as this was a condition for inclusion in the study.) On most occasions, I have attributed these finding to a lack of appropriate data (see Section 7.9).

Features with evidence of 'general' variation among the young NZE speakers surveyed for this research include phonemic alternations in *either* and *says*, and the presence of innovative *a* before vowels. Features where the results indicate an overall tendency or direction of innovation among the young speakers include FOOT and THOUGHT before /l/, where there is evidence of merger across all speakers, and the contrast between <w> and <wh>, which is almost entirely absent in the data set.

7.8. Linguistic factors in variation

While the primary aim of this research is to document social and regional variation among young NZE speakers, the mismatched data set meant that it was necessary to simultaneously investigate linguistic factors that might also explain the findings. This section outlines some of these factors.

7.8.1. Non-pre-vocalic /r/

Linguistic factors affecting the distribution of non-pre-vocalic /r/ in the data set are clearly documented in previous sections: non-pre-vocalic /r/ appears to be restricted to the context of NURSE and some examples of lettER, where it is realised as a rhotic

vowel. As a consequence, the analyses presented above are limited to tokens of <r> following NURSE.

7.8.2. Linking /r/

The frequency of collocations containing linking /r/ is a significant factor in the feature's realisation. Linking /r/ is more likely to be pronounced in high frequency collocations, a factor previously identified by Sudbury and Hay (2005). Another of their linguistic factors, presence of an adjacent back vowel, was included in the statistical model for linking /r/, but did not emerge as significant.

7.8.3. TH-fronting

The analysis of TH-fronting considers three possible linguistic explanations for the variant's distribution: Campbell and Gordon (1996) suggest that TH-fronting is less likely in function words than in content words, Starks and Reffell (2005) claim that the variant is less common in voiced <th> segments than in voiceless segments, while Trudgill (1998) notes that British English TH-fronting is possible in all environments except items with word-initial voiced <th> segments.

In Section 4.1.1, I suggest that Trudgill's explanation can account for both of the findings reported in the New Zealand studies. A high proportion of the non-fronted tokens reported by both pairs of researchers appear to involve word-initial /ð/, which is common among high frequency function words in English. With all word-initial /ð/ tokens excluded from the data set for this research – for which there were no instances of the innovative variant – neither content/function status nor segment voicing emerges as significant in the distribution of TH-fronting. This result suggests that the restriction reported by Trudgill (1998) for British English might also apply to the NZE data presented here.

7.8.4. *With* voicing

The statistical model for *with* variation considered just one potential linguistic variable, voicing of the following sound, which did not emerge as a significant factor in the variants' distribution. The data set included the lexical item *without*, which also had variable pronunciations.

7.8.5. Vowel neutralisation before /l/

There are a number of linguistic factors potentially affecting vowel measurements in this data set, many of which could not be satisfactorily controlled or evaluated (see Section 5.1.1). Section 5.2.4, however, explores potential interaction between /l/ vocalisation and pre-lateral vowel neutralisation in more detail. According to this analysis, FOOT and THOUGHT are significantly distinct before consonantal /l/ but appear to be merged before vocalised /l/. I suggest that this result may reflect an early stage of pre-lateral vowel neutralisation, which is then generalised to contexts before other allophones of /l/ (cf. Thomas 2004: 83). Given its frequency throughout the data set, it is unlikely that /l/ vocalisation is a factor affecting potential regional or social variation, none of which is identified for this variable.

7.8.6. Final /k/ epenthesis in *anything, everything, nothing,* and *something*

According to the data set presented in Section 6.4, epenthetic final /k/ in {-thing} items is significantly more likely before a vowel than before a consonant or pause. This suggests that /k/ is functioning as a syllable onset for some speakers, analogous to linking /r/.

7.9. Limitations

The data set for this research is limited. The most obvious limitation is the number of tokens of each feature and the uneven distribution of tokens across schools. Thirty tokens of each variable for each speaker is considered an ideal in sociolinguistic research (Milroy 1987: 134-135). This figure is frequently unavailable for entire schools in the research presented here.

A second limitation of the data set is its variable quality. This has already been discussed in connection to vowel measurements. Where auditory analyses were used, it was frequently problematic to differentiate between variants. Some recordings were noisy with a lot of speaker overlap, and others problematically quiet. Poor quality data also contributed to the small number of tokens available for

analysis. As outlined above, tokens were analysed blind on two occasions and omitted if the analyses did not agree.

The limitations of the data set are reflected in the ways results are presented and discussed throughout this thesis. All results sections use the phrases 'more likely' and 'less likely' to discuss variation between the schools' feature distributions; the descriptor 'significant' is only used for results found to be statistically significant through CART analyses or Pillai scores. Where numeric results are included – mostly attached to the thesis as appendices – these are consistently displayed alongside the number of tokens included in the calculations.

7.10. Future research

There are numerous opportunities for future research linked to the findings presented in this thesis. A full scale survey of nationwide NZE variation is probably unrealistic, but the following topics could be particularly rewarding:

- A more detailed study of rhoticity in the lower South Island, including comparison with older speakers in Otago. It would be interesting to explore Otago rhoticity as a potential change in progress.

- A comparison of TH-fronting, rhotic NURSE and linking /r/ loss among Māori, Pasifika and Pākehā speaker communities in the upper North Island. The high proportion of non-Pākehā residents in this region would allow more detailed study of linguistic transfer between Pākehā, Pasifika and Māori speaker groups, which this thesis proposes to be a key source for potential regional variation.

- A further investigation of potential links between pre-lateral vowel neutralisation and /l/ vocalisation. It would be possible to set up a controlled experiment comparing pre-lateral vowel mergers at different stages of completion in NZE.

- A more thorough study of *with* voicing across New Zealand. The regional variation presented for this feature is very interesting, but is reliant on a considerably smaller data set than others in this study.

7.11. Conclusion

This thesis has presented a complex survey of selected linguistic variables in the speech of New Zealand school children. Though clearly limited by its source data, the research has found forms of variation not encountered in previous studies, and contributed to a number of ongoing discussions regarding better known NZE variables.

The potential for regional variation in NZE has been a central focus for the research. Three sources for regional variation are identified, all supported by the study's findings. Māori and Pasifika populations are linked to innovative language features in the data set, and there are indications that these features are being adopted by Pākehā speakers in regions with high Māori and Pasifika populations. Moreover, speakers in regions with higher socio-economic class populations instead appear to avoid the innovative variants, leading to increased linguistic contrasts in the data set. Lastly, it is possible that existing regional variation – rhoticity in Southland – is continuing to develop and may be expanding among lower South Island speakers. A number of additional sociolinguistic factors also seem to contribute to the findings, including borrowing, stigma and prestige, and geographic isolation.

NZE variation is far more complicated than the depiction presented in this thesis. It is hoped, however, that this research serves as a sketch of linguistic variation among young New Zealanders in the early twenty-first century, and may even predict something about the NZE spoken in the future.

Appendices

Appendix A: Additional data for /r/ variables

Table 0.1: Pilot data set: tokens of non-pre-vocalic /r/ following vowels other than NURSE

School Number	General Location	Number of potential non-pre-vocalic /r/ tokens after vowels other than NURSE	Number of realised non-pre-vocalic /r/ tokens after vowels other than NURSE
1	Kaitaia	75	0
3	Whangarei	153	0
6	Auckland	128	0
10	Hamilton	109	0
11	Rotorua	56	0
17	Rangitikei Plains	70	0
19	Lower Hutt	183	0
22	Nelson	140	0
26	East Christchurch	61	0
31	Dunedin	84	0
33	Rural Southland	81	0
Total		**1140**	**0**

Table 0.2: Total data set for <r> following NURSE

School Number	General Location	Speakers	Total NURSE tokens before <r>	Rhotic NURSE tokens	Average rhotic NURSE across speakers (%)
1	Kaitaia	8	29	12	40
2	Kaikohe	9	32	13	43
3	Whangarei	11	51	6	9
4	Rural Northland	9	69	3	10
5	Helensville	6	41	0	0
6	Auckland	13	58	0	0
7	South Auckland	5	37	10	20
8	Hauraki Plains	12	26	0	0
9	Tauranga	8	33	0	2
10	Hamilton	14	52	0	0
11	Rotorua	11	92	2	2
12	Te Kuiti	6	20	0	0
13	East Cape	6	28	0	0
14	Northern Hawke's Bay	17	76	6	3
15	New Plymouth	15	66	0	0
16	Hastings	13	39	0	0
17	Rangitikei Plains	17	59	1	1
18	Dannevirke	12	27	0	0
19	Lower Hutt	14	34	0	0
20	Wellington	10	78	0	0
21	Picton	10	40	0	0
22	Nelson	18	64	0	0
23	Westport	8	31	0	0
24	Greymouth	12	55	0	0
25	North Canterbury	13	13	0	0
26	East Christchurch	8	25	1	0
27	Central Christchurch	6	21	0	0
28	Timaru	7	63	0	0
29	Queenstown	22	84	11	16
30	Maniototo	11	39	4	12
31	Dunedin	12	41	10	25
32	Gore	12	69	47	74
33	Rural Southland	8	26	21	77
Total		**363**	**1518**	**147**	

Table 0.3: Schools with evidence of rhoticity: tokens of non-pre-vocalic /r/ after vowels other than NURSE

School Number	General location	Number of potential non-pre-vocalic /r/ tokens after vowels other than NURSE or lettER	Number of realised non-pre-vocalic /r/ tokens after vowels other than NURSE or lettER	Number of potential non-pre-vocalic /r/ tokens after lettER	Number of realised non-pre-vocalic /r/ tokens after lettER
1	Kaitaia	52	0	23	0
2	Kaikohe	35	0	26	0
3	Whangarei	94	0	57	0
4	Rural Northland	92	0	66	0
7	South Auckland	32	0	22	2
29	Queenstown	102	0	74	0
30	Maniototo	35	0	24	0
31	Dunedin	52	0	32	0
32	Gore	35	0	63	9
33	Rural Southland	66	0	25	0
Total		**687**	**0**	**412**	**11**

Table 0.4: Total data set for linking /r/

School Number	General Location	Transcripts	Potential linking /r/ tokens	Average realised linking /r/ across transcripts (%)
1	Kaitaia	1	16	17
2	Kaikohe	3	16	25
3	Whangarei	4	44	42
4	Rural Northland	3	34	60
5	Helensville	2	37	39
6	Auckland	4	48	42
7	South Auckland	1	27	11
8	Hauraki Plains	5	38	32
9	Tauranga	2	18	42
10	Hamilton	5	39	65
11	Rotorua	3	38	60
12	Te Kuiti	3	14	43
13	East Cape	2	19	55
14	Northern Hawke's Bay	7	33	51
15	New Plymouth	6	38	65
16	Hastings	4	46	52
17	Rangitikei Plains	6	58	56
18	Dannevirke	5	8	56
19	Lower Hutt	5	22	45
20	Wellington	4	52	70
21	Picton	5	33	30
22	Nelson	6	38	50
23	Westport	7	14	78
24	Greymouth	5	41	60
25	North Canterbury	5	31	67
26	East Christchurch	2	17	38
27	Central Christchurch	3	13	77
28	Timaru	2	25	80
29	Queenstown	11	52	61
30	Maniototo	6	33	67
31	Dunedin	4	32	47
32	Gore	6	31	68
33	Rural Southland	3	13	20
Total		**140**	**1018**	

Appendix B: Additional data for <th> variables

Table 0.5: Total data set for TH-fronting

School number	General Location	Transcripts	Total <th> tokens	Average innovative <th> across transcripts (%)
1	Kaitaia	1	20	25
2	Kaikohe	3	30	5
3	Whangarei	4	58	1
4	Rural Northland	3	71	4
5	Helensville	2	43	29
6	Auckland	4	49	7
7	South Auckland	1	28	43
8	Hauraki Plains	5	25	32
9	Tauranga	2	34	0
10	Hamilton	5	50	5
11	Rotorua	3	59	27
12	Te Kuiti	3	24	6
13	East Cape	2	23	18
14	Northern Hawke's Bay	7	54	13
15	New Plymouth	6	52	4
16	Hastings	4	39	14
17	Rangitikei Plains	6	51	26
18	Dannevirke	5	26	28
19	Lower Hutt	5	38	1
20	Wellington	4	78	13
21	Picton	5	51	1
22	Nelson	6	54	17
23	Westport	7	20	19
24	Greymouth	5	34	9
25	North Canterbury	5	32	10
26	East Christchurch	2	14	0
27	Central Christchurch	3	21	0
28	Timaru	2	36	17
29	Queenstown	11	34	0
30	Maniototo	6	26	0
31	Dunedin	4	50	5
32	Gore	6	26	9
33	Rural Southland	3	20	2
Total		140	1270	

Table 0.6: Total data set for *with* voicing

School Number	General Location	Number of voiced *with* tokens	Number of voiceless *with* tokens	Total *with* tokens
1	Kaitaia	5	4	9
2	Kaikohe	2	3	5
3	Whangarei	8	4	12
4	Rural Northland	2	1	3
5	Helensville	6	4	10
6	Auckland	7	2	9
7	South Auckland	4	2	6
8	Hauraki Plains	0	1	1
9	Tauranga	6	0	6
10	Hamilton	2	4	6
11	Rotorua	2	3	5
12	Te Kuiti	5	0	5
13	East Cape	1	3	4
14	Northern Hawke's Bay	4	3	7
15	New Plymouth	6	4	10
16	Hastings	4	4	8
17	Rangitikei Plains	7	3	10
18	Dannevirke	0	2	2
19	Lower Hutt	2	2	4
20	Wellington	5	7	12
21	Picton	4	1	5
22	Nelson	3	9	12
23	Westport	0	2	2
24	Greymouth	1	5	6
25	North Canterbury	1	5	6
26	East Christchurch	0	1	1
27	Central Christchurch	1	2	3
28	Timaru	1	6	7
29	Queenstown	2	4	6
30	Maniototo	1	4	5
31	Dunedin	1	6	7
32	Gore	1	5	6
33	Rural Southland	0	6	6
Total		**94**	**112**	**206**

Appendix C: Additional data for vowel analyses

Table 0.7: Total data set for FOOT analyses

School Number	General Location	Total GOOSE tokens	Total FOOT tokens	Total THOUGHT tokens
1	Kaitaia	7	7	6
2	Kaikohe	21	1	8
3	Whangarei	15	13	23
4	Rural Northland	13	6	4
5	Helensville	12	14	12
6	Auckland	20	7	13
7	South Auckland	1	4	3
8	Hauraki Plains	10	10	6
9	Tauranga	7	3	7
10	Hamilton	14	9	12
11	Rotorua	25	9	8
12	Te Kuiti	13	3	1
13	East Cape	10	5	3
14	Northern Hawke's Bay	6	7	9
15	New Plymouth	16	5	13
16	Hastings	17	3	4
17	Rangitikei Plains	22	17	12
18	Dannevirke	11	4	5
19	Lower Hutt	26	12	10
20	Wellington	15	11	7
21	Picton	12	4	10
22	Nelson	15	8	14
23	Westport	14	12	2
24	Greymouth	7	9	5
25	North Canterbury	8	6	7
26	East Christchurch	9	7	7
27	Central Christchurch	9	5	3
28	Timaru	6	4	4
29	Queenstown	11	4	10
30	Maniototo	11	5	10
31	Dunedin	20	3	15
32	Gore	8	5	7
33	Rural Southland	6	5	5
Total		**417**	**227**	**260**

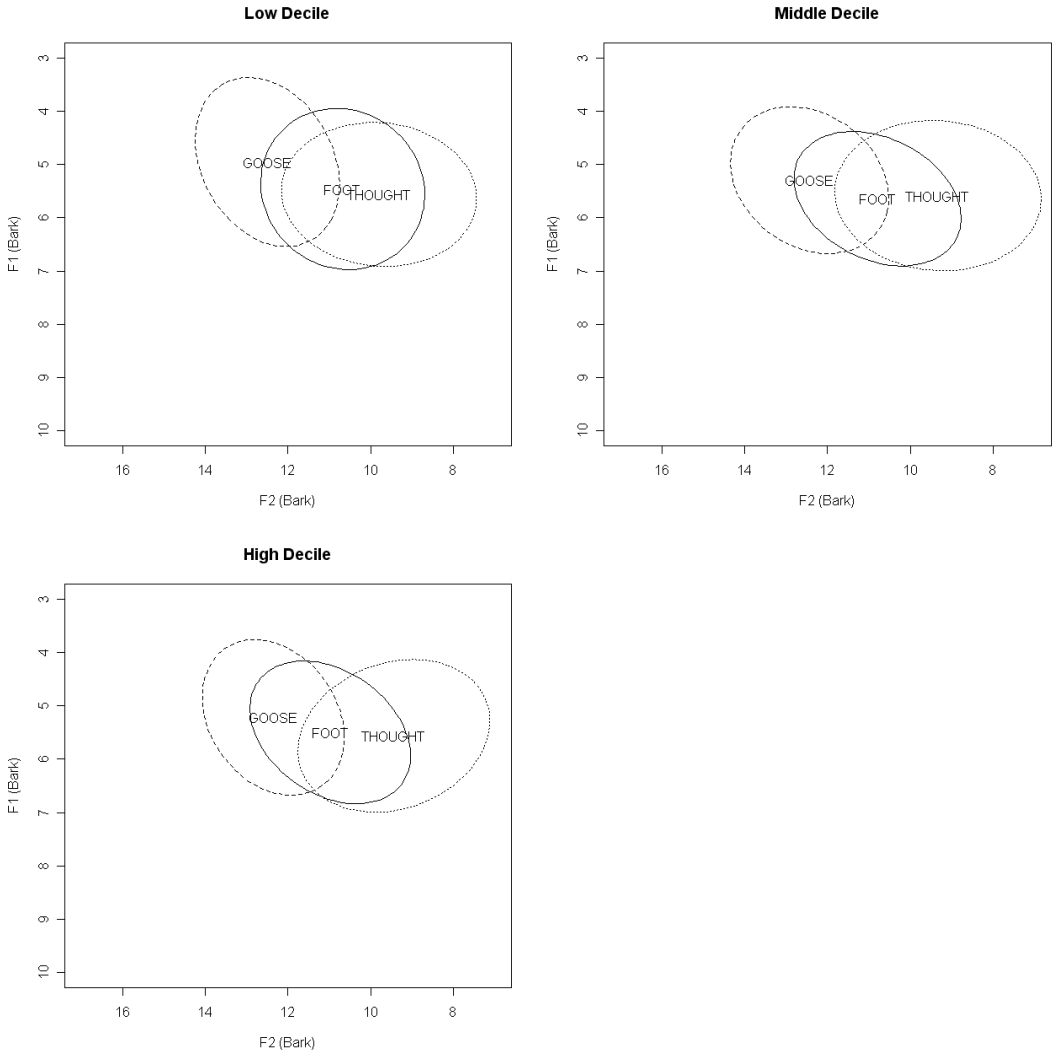


Figure 0.1: Vowel ellipses for GOOSE, FOOT and THOUGHT for low, middle and high decile students.

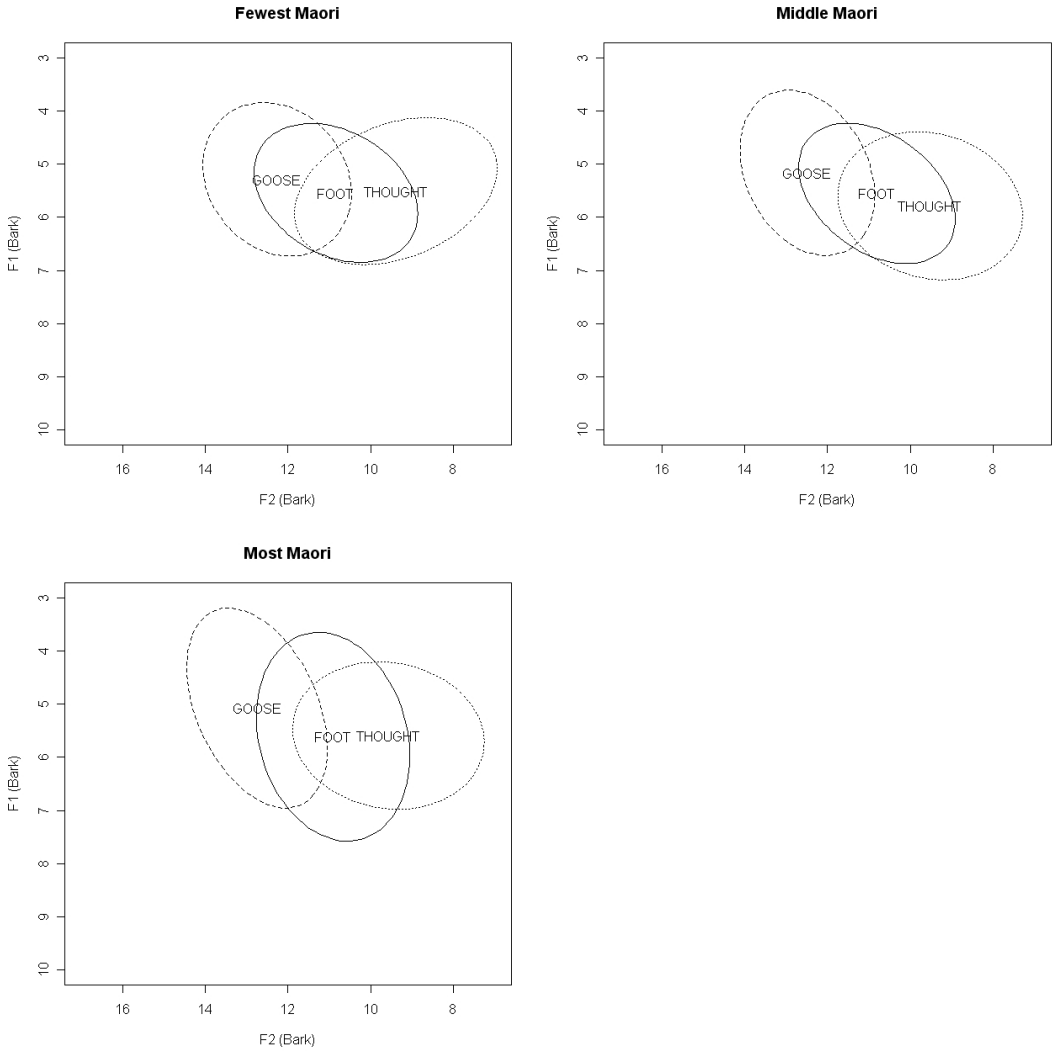


Figure 0.2: Vowel ellipses for GOOSE, FOOT and THOUGHT for schools with few, mid and most Māori students.

Table 0.8: Total data set for pre-lateral FOOT and THOUGHT

School Number	General Location	Total pre-lateral FOOT tokens	Total pre-lateral THOUGHT tokens
1	Kaitaia	2	1
2	Kaikohe	6	7
3	Whangarei	5	11
4	Rural Northland	8	9
5	Helensville	3	5
6	Auckland	9	8
7	South Auckland	5	4
8	Hauraki Plains	1	4
9	Tauranga	8	7
10	Hamilton	6	1
11	Rotorua	5	10
12	Te Kuiti	3	4
13	East Cape	2	5
14	Northern Hawke's Bay	6	10
15	New Plymouth	4	12
16	Hastings	7	5
17	Rangitikei Plains	8	18
18	Dannevirke	3	2
19	Lower Hutt	6	28
20	Wellington	5	9
21	Picton	8	11
22	Nelson	9	24
23	Westport	6	5
24	Greymouth	6	7
25	North Canterbury	0	8
26	East Christchurch	7	7
27	Central Christchurch	3	3
28	Timaru	6	3
29	Queenstown	8	6
30	Maniototo	12	3
31	Dunedin	6	9
32	Gore	6	7
33	Rural Southland	2	6
Total		**181**	**259**

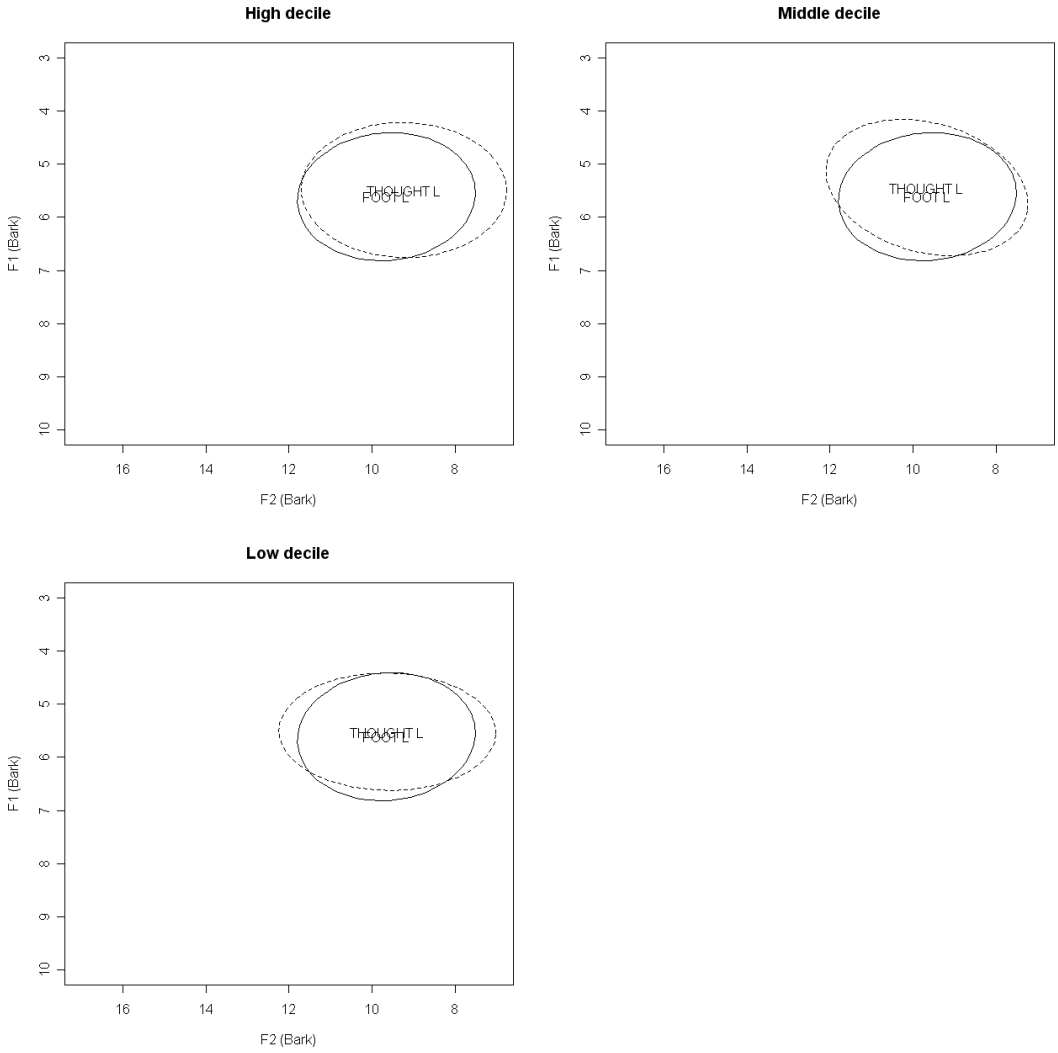


Figure 0.3: Vowel ellipses for FOOT (solid line) and THOUGHT (dotted line) before /l/ for low, middle and high decile students.

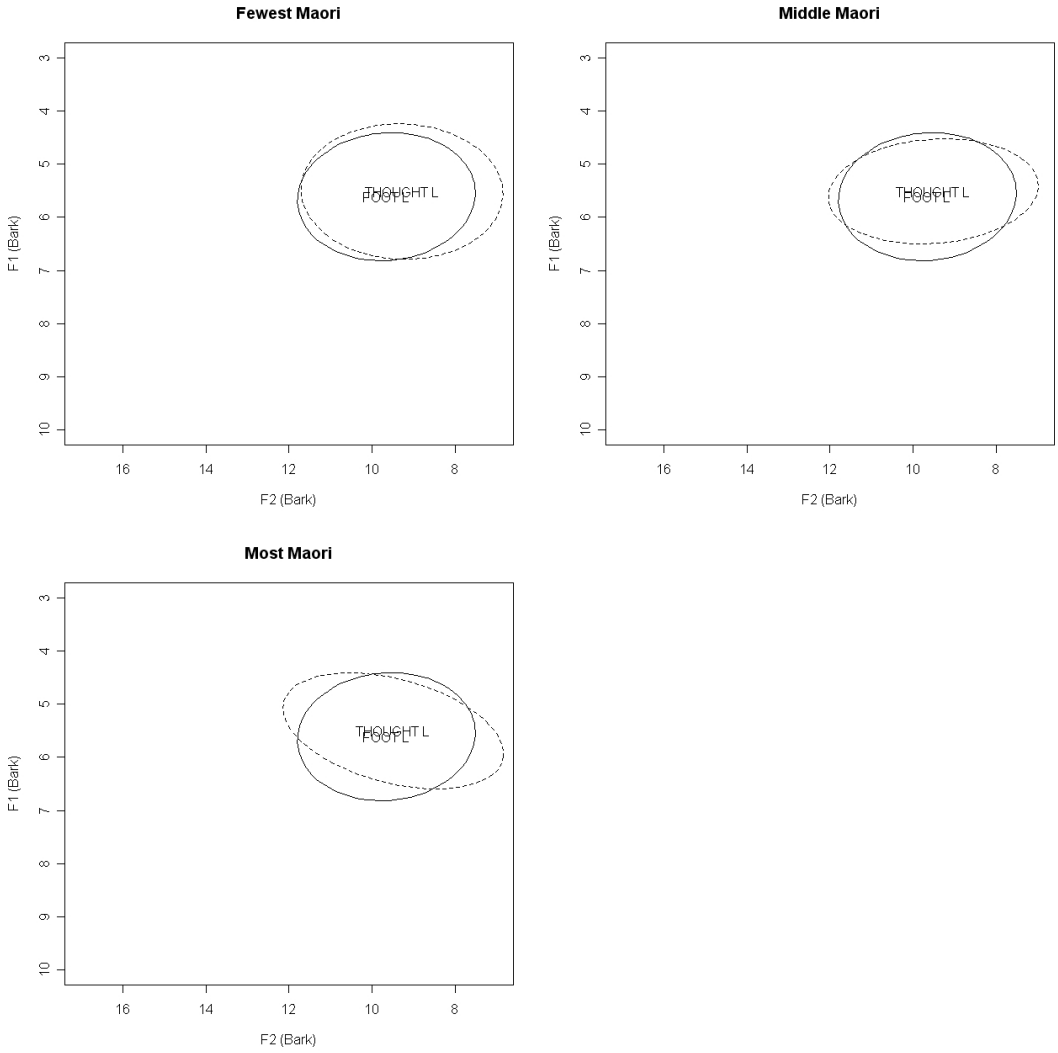


Figure 0.4: Vowel ellipses for FOOT (solid line) and THOUGHT (dotted line) before /l/ for schools with few, mid and most Māori students.

Table 0.9: Pillai scores and their significance levels for the distance between distributions of pre-lateral and non-pre-lateral FOOT and THOUGHT by subregion

Subregion	Pillai score for pre-lateral FOOT and THOUGHT	p-value	Pillai score for non-pre-lateral FOOT and THOUGHT	p-value
West Northland	0.041	0.314	0.612	0.000
East Northland	0.012	0.840	0.225	0.005
Auckland	0.040	0.038	0.477	0.000
Central North Island	0.019	0.544	0.215	0.000
Hawke's Bay - Wairarapa	0.039	0.079	0.163	0.129
Wellington	0.014	0.235	0.209	0.001
Nelson - Marlborough	0.023	0.477	0.468	0.000
South Island West Coast	0.039	0.167	0.615	0.000
Christchurch and most of Canterbury	0.017	0.804	0.283	0.005
Timaru and Central Otago Lakes District	0.020	0.429	0.533	0.149
Southland and East and South Otago	0.032	0.037	0.155	0.015
Mean	**0.027**	**0.360**	**0.359**	**0.028**

Appendix D: Additional data for lexical and miscellaneous features

Table 0.10: Total data set for *a* before vowels

School Number	General Location	Tokens of *a* before a vowel	Tokens of *an* before a vowel	Total tokens
1	Kaitaia	3	1	4
2	Kaikohe	2	0	2
3	Whangarei	3	5	8
4	Rural Northland	1	2	3
5	Helensville	0	1	1
7	South Auckland	3	1	4
9	Tauranga	0	1	1
10	Hamilton	0	3	3
11	Rotorua	5	3	8
12	Te Kuiti	1	0	1
13	East Cape	1	1	2
14	Northern Hawke's Bay	2	0	2
17	Rangitikei Plains	2	2	4
19	Lower Hutt	1	4	5
20	Wellington	0	5	5
21	Picton	1	2	3
22	Nelson	1	5	6
23	Westport	1	2	3
24	Greymouth	3	6	9
25	North Canterbury	0	1	1
26	East Christchurch	0	1	1
27	Central Christchurch	0	2	2
29	Queenstown	1	3	4
30	Maniototo	2	2	4
31	Dunedin	1	3	4
32	Gore	0	3	3
33	Rural Southland	1	0	1
Total		35	59	94

Table 0.11: Total data set for *either*

School Number	General Location	Tokens of /iðə/	Tokens of /aⁱðə/	Total *either* tokens
3	Whangarei	1	0	1
4	Rural Northland	0	2	2
6	Auckland	0	1	1
9	Tauranga	2	0	2
10	Hamilton	0	2	2
11	Rotorua	1	0	1
14	Northern Hawke's Bay	1	0	1
15	New Plymouth	4	3	7
18	Dannevirke	1	0	1
20	Wellington	1	0	1
22	Nelson	1	1	2
23	Westport	0	1	1
25	North Canterbury	1	0	1
28	Timaru	2	2	4
29	Queenstown	0	2	2
30	Maniototo	2	1	3
31	Dunedin	0	2	2
Total		**17**	**17**	**34**

Table 0.12: Total data set for *says*

School Number	General Location	Tokens of /sez/	Tokens of /sæ^{i}z/	Total *says* tokens
2	Kaikohe	4	1	5
3	Whangarei	2	5	7
4	Rural Northland	1	1	2
5	Helensville	5	1	6
6	Auckland	1	3	4
7	South Auckland	3	2	5
9	Tauranga	1	1	2
10	Hamilton	4	2	6
11	Rotorua	1	0	1
12	Te Kuiti	2	0	2
13	East Cape	2	0	2
14	Northern Hawke's Bay	2	4	6
16	Hastings	2	3	5
17	Rangitikei Plains	4	4	8
18	Dannevirke	0	1	1
19	Lower Hutt	2	0	2
20	Wellington	1	6	7
21	Picton	2	0	2
22	Nelson	1	2	3
23	Westport	2	0	2
24	Greymouth	1	0	1
25	North Canterbury	10	0	10
26	East Christchurch	2	0	2
27	Central Christchurch	3	0	3
28	Timaru	1	0	1
29	Queenstown	2	2	4
30	Maniototo	1	2	3
31	Dunedin	2	4	6
32	Gore	1	0	1
Total		**65**	**44**	**109**

Table 0.13: Total data set for epenthetic final /k/ in {-thing} items.

School Number	General Location	No of transcripts	Potential tokens of epenthetic final /k/	Average realised epenthetic final /k/ across transcripts (%)
1	Kaitaia	1	10	20
2	Kaikohe	3	12	17
3	Whangarei	4	20	27
4	Rural Northland	3	27	20
5	Helensville	2	29	8
6	Auckland	4	26	2
7	South Auckland	1	10	20
8	Hauraki Plains	5	10	10
9	Tauranga	2	16	13
10	Hamilton	5	33	2
11	Rotorua	3	39	26
12	Te Kuiti	3	11	47
13	East Cape	2	16	13
14	Northern Hawke's Bay	7	26	22
15	New Plymouth	6	41	7
16	Hastings	4	36	14
17	Rangitikei Plains	6	32	12
18	Dannevirke	5	17	5
19	Lower Hutt	5	26	21
20	Wellington	4	47	0
21	Picton	5	35	7
22	Nelson	6	36	4
23	Westport	7	26	26
24	Greymouth	5	41	24
25	North Canterbury	5	13	40
26	East Christchurch	2	16	0
27	Central Christchurch	3	16	0
28	Timaru	2	21	22
29	Queenstown	11	35	8
30	Maniototo	6	14	5
31	Dunedin	4	22	27
32	Gore	6	28	28
33	Rural Southland	3	12	0
Total		**140**	**799**	

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