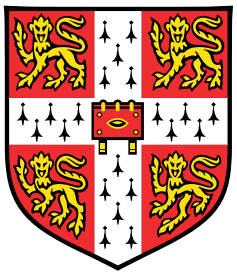
21st Century New Zealand English: A change of direction?

Vowel shift reversal and liquid changes in Wellington



Elizabeth C. Blackwell

MPhil in Theoretical & Applied Linguistics (by Thesis)
University of Cambridge

This dissertation is submitted for the degree of
Master of Philosophy

Newnham College 12 June 2025

Declaration

This thesis is the result of my own work and contains nothing which is the outcome of work done in collaboration with others, except as specified in the text. The thesis is 29,974 words in length, including footnotes.

Elizabeth C. Blackwell
12 June 2025

Acknowledgements

I am lucky enough to be thanking friends, family and colleagues across two hemispheres for making this research possible. To my family, friends and participants in Aotearoa New Zealand, ngā mihi nui. I would have no thesis without you, and I am so grateful that you donated your time to this project during an already busy season. A special thanks goes to my Aunt Margaret, who not only introduced me to several social networks of participants, but who was also a logistics superstar and a fantastic source of support throughout my time in Wellington.

At the other antipode, I would like to thank everyone in Cambridge who made this year far less of a hermitage than it otherwise could have been. To my fellow linguists Eve, Kitty and Ian, who joined me for countless lunches and endured many a manic graph show-and-tell; to my partner, for your faith and patience in me and my nerdery; to everyone at the phonetics lab, who provided such a supportive working environment; to my supervisor, Dr. Kirsty McDougall, whose guidance facilitated this entire thesis; and to everyone else who has been a part of this year: I am so very grateful to each and every one of you. My heartfelt thanks also go to the Philological Society, for funding my studies this year.

Finally, for support spanning both sides of the equator, I would like to thank my parents. Firstly for introducing me to New Zealand English at a very young age – but beyond that, for backing me throughout this entire process and being incredibly gracious whenever I made you self conscious about your accents! I am incredibly fortunate to have had you in my corner this year and all years.

Abstract

New Zealand English is canonically defined by its raised short front vowels, heavily vocalised rhyme /l/, and a lack of rhoticity in the standard variety. However, recent research in Tāmaki Makaurau/Auckland, the country's largest city, has suggested that there is an apparent lowering of vowels in the DRESS and TRAP lexical sets among speakers born around the turn of the millennium (Ross 2018, 2024; Ross et al. 2021, 2023). In addition partial rhoticity of the NURSE lexical set may be becoming a socially salient marker of identity in the Pasifika (Pacific Island diasporic) community in the north of the country (Starks and Reffell 2005; Gibson 2005; Marsden 2017; Ross 2024). This thesis examines speakers in the capital, Pōneke/Wellington, a city at the south of the North Island which has had relatively little sociophonetic attention in recent years, and investigates changes in younger speakers' vowel spaces and liquid realisations. Comparisons are made to contemporary findings in Auckland, Whakatū/Nelson, and Ōtautahi/Christchurch, and it is suggested that New Zealand English is not simply 'carrying on' the sound changes by which linguists define the dialect, but rather embarking on a new trajectory in the 21st Century.

Table of contents

List of figures

List of tables

Chapter 1

Introduction

1.1 A brief history of English in Aotearoa New Zealand

Aotearoa New Zealand, an isolated set of islands in the South Pacific, is the most recent major land mass to be undergo human settlement (Walrond, 2004). Figure 1.1 shows a map of the country, with relevant places marked.

1.1.1 New Zealand's changing demography

New Zealand English (NZE) is relatively young in terms of global Englishes. In the centuries prior to European colonisation, New Zealand was discovered and subsequently settled by tangata whenua (indigenous peoples) who had navigated across the Pacific Ocean and established themselves at least as early as 1300 AD (Mein Smith, 2011). It is the descendants of these navigators who form modern New Zealand's indigenous Māori population. Following the voyages of Captain James Cook in the late 18th Century, English-speaking settlers arrived and began to colonise New Zealand. In the mid-19th Century, after the signing of Te Tiriti o Waitangi/the Treaty of Waitangi in 1840, and later legislation such as the New Zealand Settlements Act of 1863, increasing amounts of land were purchased or seized by the Crown amongst rapidly climbing numbers of English-speaking arrivals (Orange, 1997).

The earliest planned colonial settlements were established by the New Zealand Company in the early 19th Century, and included Pōneke/Wellington, the country's capital city. These early settlers were largely from England, although records are not firm until later in the century. During the gold rush of the 1860s these demographics began to change, with large numbers of settlers also arriving from Ireland, China, California and Victoria (Hay et al. 2008; Mein Smith 2011). In the latter half of the 19th Century, immigration from the United

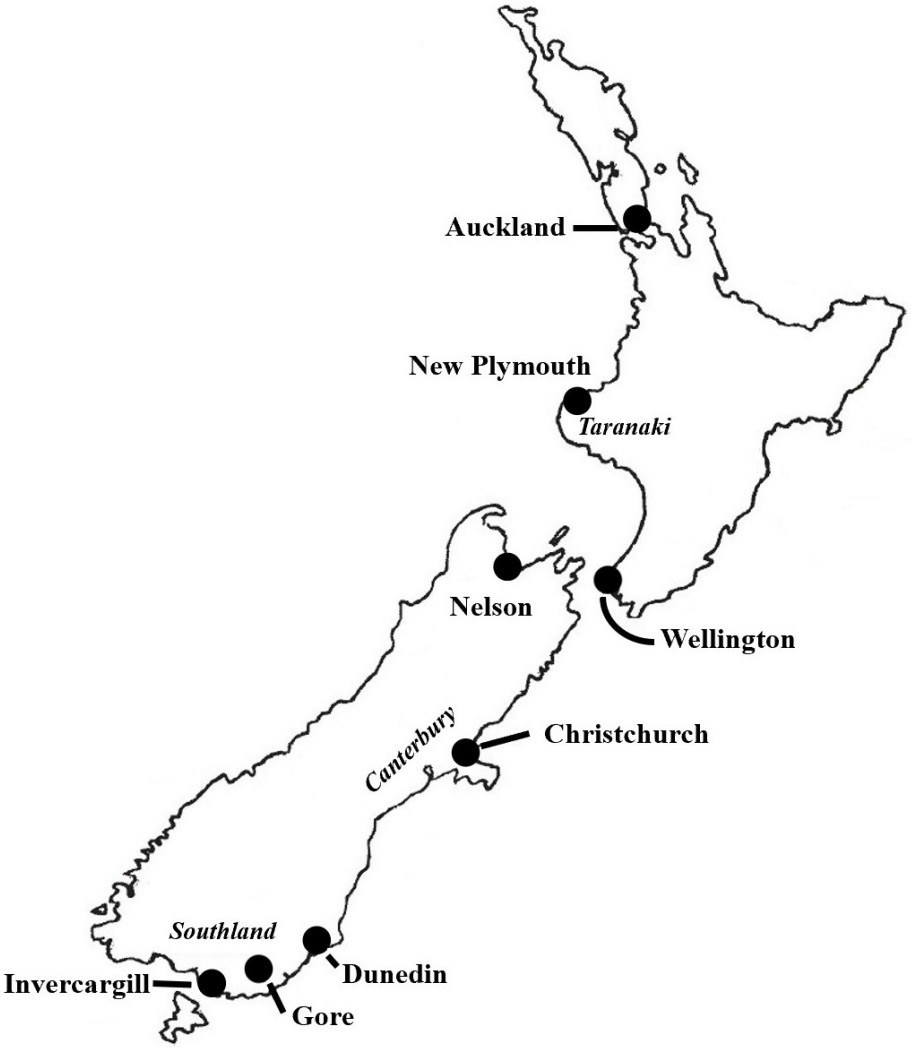


Fig. 1.1 A map of New Zealand, with linguistically relevant locations marked

Kingdom was actively encouraged by the government through heavily subsidised travel fares – passage to the colony from Europe was even free for part of the 1870s, and settlement boomed as result (Mein Smith 2011). Gordon et al. (2004) report that in New Zealand's 1871 census data, just over half (51%) of migrants to New Zealand were English, 27% Scottish, and 19% Irish, with other English-speaking arrivals also coming from Australia and North America. English migration was predominantly from the south, and statistics from the time include a large number of Cornish emigrants following the decline of the tin mining industry there (Arnold, 1981).

Immigration policy in New Zealand at this time was very prejudiced, with policies such as the 1881 Chinese Immigrants Act and the 1920 Immigration Amendment Bill continu-

ing to prioritise British migrants and discourage non-English speakers well into the 20th Century (Docker and Fischer 2000). These policies were introduced with the explicit aim of maintaining the majority status of New Zealand's British population, and this intention remained until the Immigration Act of 1987, which emphasised professional skills above country of origin (Smits 2019). Since this change of policy, there has been a major shift in immigrant demographics away from Europe and towards New Zealand's closer neighbours, with the number of Asian New Zealanders nearly doubling between 2001 and 2019 alone (Smits 2019). In 2023, the four most numerous groups of immigrants to New Zealand were citizens of India, the Philippines, China, and Fiji, and decreases in net migration from South Africa, Australia and the United Kingdom (Tatauranga Aotearoa/Stats NZ 2024c). Whilst Pākehā/European New Zealanders still form the majority of the population at, 67.8 percent, both Māori and Asian New Zealander populations have seen particularly rapid increases in recent years (Tatauranga Aotearoa/Stats NZ 2024a), representing a demographic shift towards a more culturally and linguistically diverse 21st Century New Zealand.

1.1.2 Dialect formation

The development of NZE has often been used as a case study for models of new-dialect formation due to its recency and the availability of recordings from early speakers (see section 1.2.1 below). One such model is Trudgill's framework of new-dialect formation (e.g. Trudgill 1986; 1998; 2004). By this account, NZE is a deterministic product of its input varieties, namely the English varieties spoken in the parts of Great Britain and Ireland (and, to a lesser extent, Australia and North America) which contributed to early immigration. Trudgill's model of new-dialect formation is largely influenced by evidence from the ONZE corpus of early NZE (section 1.2.1), and contains the following processes:

Trudgill's model of new-dialect formation, with examples from Trudgill (2004)

1. **Mixing**: Speakers of different dialects form a new linguistic community, with a diverse mixture of linguistic variants.

2. **Levelling**: Variants only used by a minority of the language community become lost. For example, Scots features such as /u:/ in *house* or *down*.

3. **Unmarking**: In cases where the existing pool of variants has no clear majority, the typologically 'unmarked' variant is retained and 'marked' variants lost.

4. **Interdialect development**: New forms arise that were not present in any of the 'parent' varieties, sometimes from hypercorrection: For example, inserting initial /h/ before stressed vowels.

5. **Reallocation**: Where multiple variants still survive in free variation, the optionality may be reanalysed as stylistically, socially, or phonologically conditioned. For example, Trudgill (1986) argues that 'Canadian Raising' is a reallocation of dialect variation in PRICE and MOUTH to allophonically conditioned variation.

6. **Focussing**: The newly koinéised variety moves towards homogeneity, stability and codification.

Another model of dialect formation is that of Schneider (2007), whose 'Dynamic Model' of postcolonial Englishes also draws frequently on NZE, among other varieties. In his model, the development of a new colonial English undergoes five distinct stages. These stages are broadly similar to Trudgill's model above, but continue past the process of codification:

Schneider's dynamic model of postcolonial Englishes (Schneider 2007)

1. **Foundation**: Initial contact and outpost-style settlements. Early koinéisation and lexical borrowing for place-names. Initial acquisition of English by some indigenous individuals in close contact with colonial settlements.

2. **Exonormative stabilisation**: Larger-scale colonisation and establishment of English-language administration. Bilingualism becomes more of a norm in indigenous communities.

3. **Nativisation**: More intense lexical borrowing into English. Increasing political independence, but linguistic prestige and influence still largely derive from British English. Language shift towards English in indigenous communities, with accompanying contact effects such as transfer and substrate influence.

4. **Endonormative stabilisation**: A new, independent cultural identity arises, and the variety becomes codified, homogenised, and used in prestigious contexts.

5. **Differentiation**: Sociopolitical identities become more diverse and internal divides more stable. New sub-varieties arise for regions and social groups, reflecting this new societal structure.

A major difference between these two models is the integration by Schneider of language shift in indigenous communities, as opposed to Trudgill's "tabula rasa" approach. Trudgill does acknowledge the influence of neologisms needed as a result of the new physical environment, and more general language contact with existing indigenous languages, but assumes the influence of te reo Māori (the Māori language) to be fairly minimal on NZE beyond lexical borrowing. Contact with te reo Māori has always been, and is to an increasing extent, a major part of New Zealand's linguistic landscape. Early contact with European settlers led to a number of loanwords from te reo Māori into English, often names for local flora and fauna such as 'kiwi' (the national bird), 'kererū' (New Zealand's endemic woodpigeon), or names for elements of Māori culture such as 'haka' (a ceremonial dance), or 'pā' (a fortified village). These are the instances of lexical borrowing accounted for by Trudgill, and were typical of early speakers of NZE.

However, since the late 20th Century te reo Māori loanwords have begun to enter English in contexts where an English translation exists, but a more nuanced cultural meaning is being invoked. An example of this is the word 'whānau', which superficially translates to 'family' but is more often used to refer to extended family and close community, and was even used to refer to the country as a whole during national efforts to reduce the transmission of Covid-19 during the recent pandemic (Braunias 2020). In a corpus-based study of te reo Māori loanwords in official contexts (e.g. parliamentary debates, national newspapers), Macalister (2006) finds a sharp increase in loans from te reo being used for 'social culture' concepts from the 1970s, whereas earlier loans had largely been of the proper noun type described above. The number of New Zealanders who can speak te reo Māori is increasing, rising by 15% between 2018 and 2023 alone (Stats NZ/Tatauranga Aotearoa 2024b). Increasingly, codeswitching between English and te reo is used to signal affiliation with Māori community and practices, especially in official or symbolic institutions such as the national museum, Te Papa Tongarewa (Schneider 2007:131), or by New Zealanders who wish to express a positive relationship to Māori culture (Thompson 1990).Younger New Zealanders are increasingly likely to have had some education in te reo Māori, and have larger working vocabularies than older generations of New Zealanders as well as a broader familiarity with linguistic properties such as phonotactics and word formation (Oh et al. 2020, 2023; Mattingley et al. 2024). Therefore, when approaching contemporary NZE, the influence of te reo Māori, especially on lexical features, should not be underestimated.

Another difference between Schneider's and Trudgill's models is the proposed stage of development for contemporary NZE, since Trugdill's stage of 'Focussing' broadly corre-

sponds to Schneider's 'Endonormative Stabilisation'. Trudgill explicitly states that NZE has undergone all stages in his model - the new dialect *has formed*, and he suggests that completion of these six processes had occurred by the generation of speakers born in 1890 (2004:113). However, Schneider (2007) places NZE in the middle of the 'Differentiation' stage: social and ethnic variation have been demonstrably arising since the 20th Century (see sections 1.3.2 and 1.3.4 below), but regional variation is minimal (aside from the partially imported Southland dialect, discussed in section 1.3.1 below). Nevertheless, Schneider predicts confidently that "This is likely to change in the near future" (2007:133), a hypothesis that will be discussed in section 1.3.1.

1.1.3 "Nu Zilland": Early discourse surrounding New Zealand English

Folk awareness of New Zealand's developing dialect was often couched in criticisms in the early and mid-20th Century. Gordon et al. (2004) give as an example a 1948 extract from the New Zealand Listener (a popular weekly magazine), where a speech examiner from Trinity College, London, notes that "as a race, you are not very good at short vowels [...] I observe that, as a whole, New Zealand tongues are idle [...] Is it to be 'New Zealand' or 'Nu Zilland'?". The rather infamous book "New Zealand English: How it Should be Spoken" (Wall 1938) represents a general effort at the time to keep the speech of New Zealanders closely associated with British English, in particular Received Pronunciation (RP), the prestige variety in England during this period. Gordon et al. (1990) describe a culture of school inspectors in the early 20th Century discouraging the developing "colonial twang", and into the late 20th Century, RP remained a strong leader in New Zealanders' ratings of accent prestige (Bayard, 1990a, 1991; Abell, 1980).

1.2 Major corpora of New Zealand English

1.2.1 The Origins of New Zealand English project (ONZE)

As mentioned above, NZE is unusual in that recordings of its linguistic infancy are available to linguists today. Because the history of NZE is not much older than the advent of audio recording, the speech of some early settlers can still be heard in interviews made in the 1940s by the National Broadcasting Company. These recordings were discovered by Gordon and colleagues at the University of Canterbury, and compiled as part of a corpus of early NZE named the 'Mobile Unit', which represents 250 speakers from across the country born between 1851 and 1910. A second corpus, the 'Intermediate Corpus', consists of interviews with 130 speakers born between 1890 and 1930, conducted by a social historian in the 1990s.

The third, most recent corpus has been collected by linguistics researchers at the University of Canterbury, and consists of interviews with speakers born from 1935 onwards, mostly in the Canterbury area. Together, these three corpora form the 'Origins of New Zealand English' dataset (Gordon 1998; Maclagan et al. 1999; Gordon et al. 2004). With the eldest speakers born only a decade after the Treaty of Waitangi, the project represents the majority of NZE's main period of development, and has provided data for many of the canonical accounts of NZE's history (e.g. Gordon et al. 2004; Maclagan and Gordon 1996, Trudgill et al. 1998; Brand et al. 2021).

1.2.2 The New Zealand Spoken English Database (NZSED)

Whilst the ONZE corpora, particularly the later corpus, largely consists of speakers from the Canterbury area in Te Waipounamu/the South Island, the New Zealand Spoken English Database represents speakers in and around Wellington, the country's capital city, and Kirikiriroa/Hamilton, a city in the central North Island. The corpus is not yet complete, but recordings were made from 1999-2002 by researchers at Victoria University in Wellington (Warren 2002), and data from the corpus have been used in some subsequent phonetic research (e.g. Warren 2006, 2018).

1.2.3 The Auckland Voices Project (AVP)

Until recently, Tāmaki Makaurau/Auckland was under-represented in NZE research, despite being the country's largest city, home to a third of the national population (Stats NZ/Tatauranga Aotearoa 2025a). The Auckland Voices Project (AVP) seeks to address this under-representation in NZE research (e.g. Watson et al. 2018, 2019; Meyerhoff et al. 2021; Ross 2018, 2024; Ross et al. 2023). Auckland has long been ahead of the curve of New Zealand's increasing demographic diversity: 42.9% of Auckland residents were born overseas as of 2018, compared to 27% nationally (Stats NZ Census data 2025a, 2024b), placing Auckland amongst the most diverse cities in the world (Lee and Guadagno 2015). The interviews for the AVP were undertaken in 2017-2018 with 70 speakers aged 18 years and upwards, born and raised in three of the city's suburbs (Mount Roskill, Papatoetoe and Titirangi), and represented speakers in Auckland's Māori, Pākehā and Pasifika communities.

1.2.3.1 Nelson dataset

As part of her research into contemporary vowel variation in NZE, Ross (2024) has compared data from the AVP to data collected in Nelson, a small city of around 50,000 (Stats

NZ/Tatauranga Aotearoa 2025b) just south of the Cook Strait (see figure 1.1). Collection of the dataset was heavily impacted by pandemic lockdown measures, but in 2021, 18 speakers across two age groups (under 25 and over 40 years old) were interviewed. So far, the corpus has not formed the basis of research beyond that of Ross (2024).

1.2.4 QuakeBox

In 2010 and 2011, two earthquakes devastated the Canterbury area, causing significant loss of life and rendering large areas of the city uninhabitable due to liquefaction. Shortly after in 2013, the University of Canterbury launched the 'QuakeBox' project, aiming to document the experiences of Canterbury residents affected by the earthquakes in their own words. The 'QuakeBox' was a converted shipping container, moved between locations with a focus on the most severely impacted suburbs in east Christchurch. Participants were prompted to reccount their story in monologue to the microphone and, optionally, a video camera, and were also able to choose whether the researcher was present in the container. Over 700 individuals participated, and 587 stories were included in the publicly available corpus. 431 of these stories were told by self-identified New Zealanders – the project was not exclusively limited to NZE, or even English, as participants were given the option to also record their story in a second language. The corpus provides a broad snapshot of NZE in contemporary Canterbury, though participants were not necessarily born in, or even long-term residents of Canterbury. In 2019-2021, a public request was made by the QuakeBox team inviting those who had participated in 2013 to return and re-tell their stories for "QuakeBox Take 2: Kōrero Mai", allowing for longitudinal study of these speakers. Although the Canterbury Corpus section of the ONZE project is still being augmented, QuakeBox provides an even richer source of potential data for 21st Century NZE.

The QuakeBox corpus has contributed to recent research from the University of Canterbury. Blackwood (2022) investigates vowel realisations by kindergarteners (four to five year-olds) in the corpus, representing speakers born between 2008 and 2009. However, due to their young age, direct comparison to older speakers was not possible for vowel analyses. The corpus has also been used as a point of comparison to speakers in Gloriavale (a separatist Christian cult in the South Island) in a paper by Hurring and Clark (2025). In this latter study, statistical analysis of age-related change in QuakeBox vowels wass not undertaken, but it is plotted visually. Figure 1.2 reproduces this plot, which shows average normalised monophthong values for three generations of a subsection of QuakeBox participants:

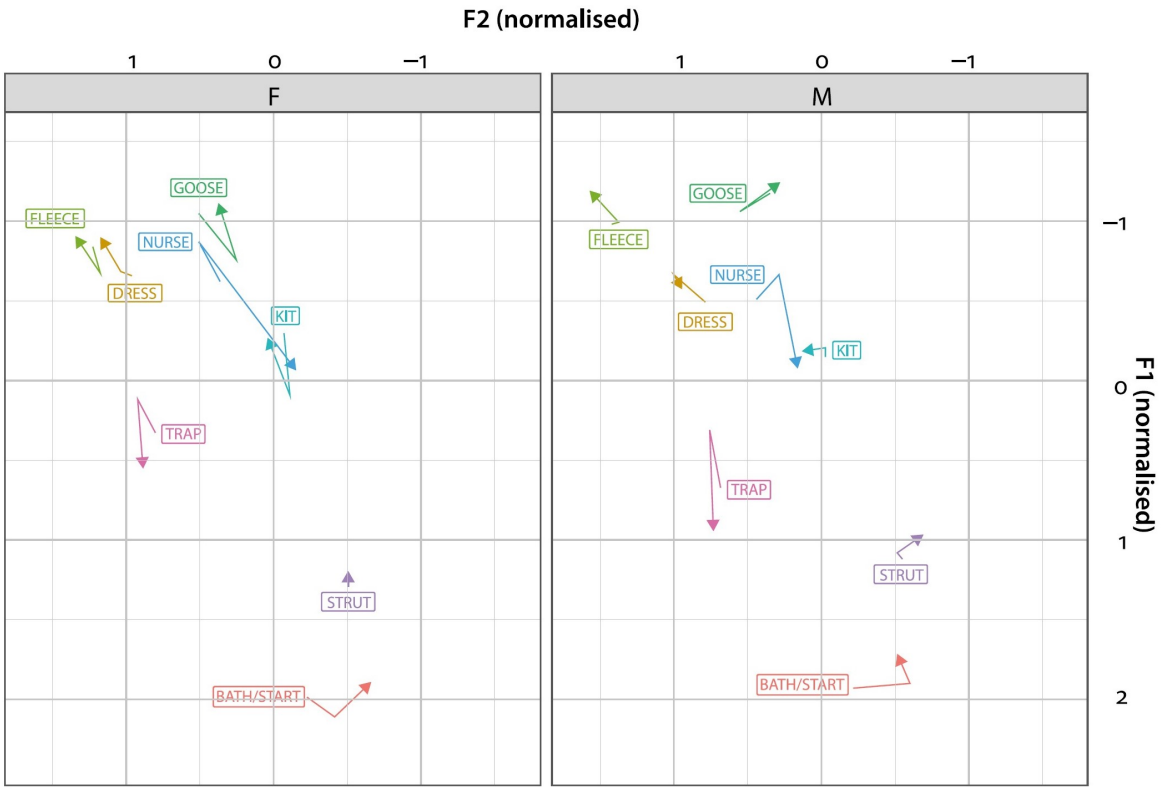


Fig. 1.2 Vowel change across three generations of QuakeBox speakers, reproduced from Hurring and Clark (2025:20)

In a further recent paper investigating patterns of covariation between the two recording periods, Hurring et al. (2025) undertook statistical analysis of the wider QuakeBox dataset, modelling age-graded variation within the QuakeBox corpus and including new analyses of LOT and THOUGHT.

1.2.5 Timeline of New Zealand English Corpora

Figure 1.3 shows a timeline of participant birthdates and recording times of the corpora above. Note the approximate lower ranges for the AVP datasets, and the extended range for QuakeBox's child participants, denoted with the asterisk.

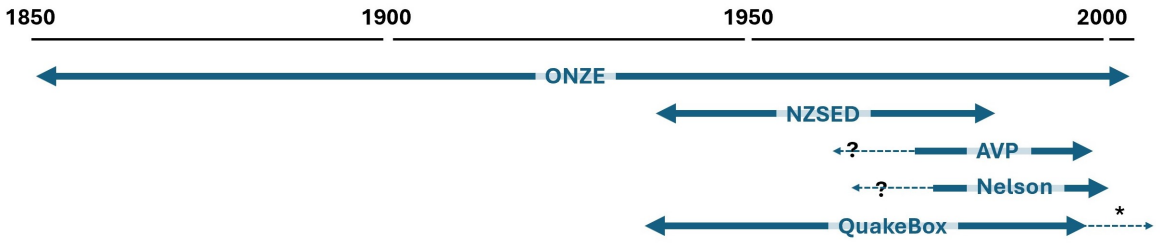


Fig. 1.3 Speaker years of birth for major New Zealand English corpora

It can be seen in this timeline that the only corpus representing Wellington, the NZSED, is also the only major corpus without representation of speakers born after the 1990s – there is little to no data available for analysis of Wellington speakers under the age of 35 years.

1.3 Sociolinguistic Variation in New Zealand English

1.3.1 Geographical variation

Though NZE has historically had little in the way of regional variation, the major exception to this is the dialect spoken in Southland, the south of New Zealand's South Island (Bayard 1990b; Bartlett 1992, 2002), which, despite prevalent folk convictions that there are many NZE regional dialects, is the only regional accent reliably identifiable by New Zealand residents, (Gordon 1997b; Nielsen and Hay 2005). Southland English is commonly understood to derive from the greater presence of Scottish settlers in this area of New Zealand, and the most salient feature of the dialect is its partial rhoticity (Bayard 1990b; Bartlett 1992, 2002; Gordon 2004:172). Southland English also resists the merger of /hw/ and /w/ more than non-Southland NZE, another feature attributed to Scottish influence (Bauer 1986:229; Gordon 2002).

In addition to the Southland dialect, there are persistent folk convictions that NZE has other regional varieties. Nielsen and Hay (2005), in a study of regional accent perception across the country, found that whilst Southland was the most frequently described regional variety, there were also descriptions of Canterbury accents as "English", Wellington accents as "official" or "sophisticated", and Taranaki accents as "farmer speech" with a slow speech rhythm. However, there is limited understanding of the extent to which linguistic variation contributes to these views, as opposed to regional stereotypes and other social factors such as class or ethnicity. As discussed in section (1.1.2), Schneider (2007) predicts the imminent development of regional variation in NZE, as has been happening in Australia in the past

several decades (e.g. Cox and Palethorpe, 2019, 2024:3). Bauer and Bauer (2002) undertook a large-scale project of investigating regional patterns of language use by asking children what names they use for particular playground games, with the reasoning that these words are subject to very little outside influence from parents or media and instead may reflect patterns of geographical diffusion in NZE. They sent questionnaires to 150 schools across the country, and identified a broad tripartite division to New Zealand's linguistic community. Figure 1.4 shows a map of New Zealand, with Bauer and Bauer's proposed linguistic regions superimposed.

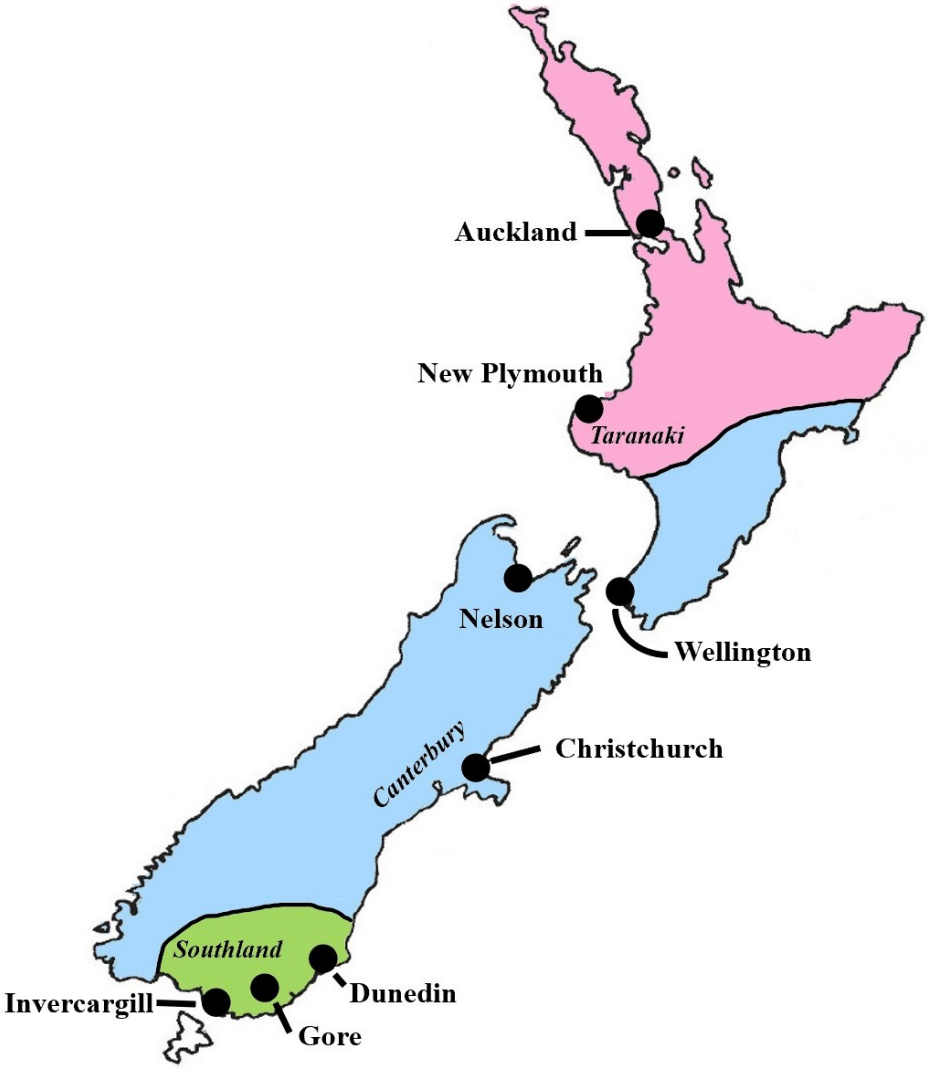


Fig. 1.4 Proposed dialect areas from Bauer and Bauer (2002)

Despite Aotearoa New Zealand's geographical division into two main islands, Bauer and Bauer's findings do not neatly reflect this: their 'central' region encompasses both the south

of Te-Ika-a-Māui/the North Island and the north of Te Waipounamu/the South Island. The presence of a Southland region is unsurprising, however, and the separation of Auckland from the south of the North Island is also expected, being so large and diverse compared to the national average (see section 1.2.3). Further to Bauer and Bauer's lexical variation findings, Ainsworth (2004) has identified some suprasegmental variation in NZE between the Wellington and Taranaki regions. As mentioned above, participants in the study by Nielsen and Hay (2005) often considered Taranaki locals to have particularly 'musical' speech, and Ainsworth's findings support this, with speakers in Taranaki tending to use more dynamic intonation patterns than their Wellington counterparts. Another variable that appears to have a degree of regional distribution in New Zealand is the pronunciation of *with*, which Kennedy (2006) found to be largely pronounced [wɪθ] in the South Island but [wɪð] in the north of the country. Whilst New Zealand may not yet have endogenous regional *varieties*, it seems that NZE does seem to be developing a degree of regional *variation*, as predicted by Schneider (2007).

1.3.2 Socioeconomic variation

When discussing socioeconomic variation in NZE, the "broad-general-cultivated" continuum is often used, following Mitchell and Delbridge's 1965 survey of variation across Australia. 'broad' NZE is typically associated with working class speech, as well as rural locations, 'general' NZE is the most prevalently spoken and represents a supraregional standard, and 'cultivated' NZE, spoken by New Zealanders with very high socioeconomic status, displays similarities to British RP. Broad NZE has particularly notable differences in diphthong realisations: in the early 20th Century, the diphthongs PRICE, MOUTH and FACE developed innovative variants that were of particular moral injury for prescriptivists such as Arnold Wall (see section 1.1.3). Gordon and Maclagan (2008) provide descriptions of these variants: [ɔe] for PRICE, as opposed to the IPA description of [ɑe] for general NZE by Bauer et al. (2007); [e̞ə] for MOUTH ([æo] in Bauer et al.), and [ɐe] for FACE ([æe] in Bauer et al.). The use of these broad variants has historically been stigmatised, especially for female speakers, for whom usage of these diphthongs is linked to heavily negative stereotypes by many NZE speakers (Gordon, 1997a). Gordon and Maclagan also include centralised productions of KIT and retraction of [tɪ̊] and [stɪ̊] to [tʃɪ̊] and [ʃtʃɪ̊] as features of broad NZE, and Kennedy (2006) also finds TH-fronting and r-liaison to be both subject to socioeconomic variation throughout New Zealand.

1.3.3 Gender and variation

As mentioned above, broad diphthong variants are particularly stigmatised for female NZE speakers (Gordon, 1997a). Maclagan et al. (1999) found that whilst realisations of FACE, PRICE and MOUTH were typically more conservative in female speakers compared to their male counterparts, realisations of TRAP, DRESS and KIT by these same speakers were not conservative and were in fact more innovative than the male speakers. Maclagan et al. interpret these findings as supporting the proposal of Labov (1990) that women tend to be more innovative in sound changes that escape stigmatisation, whilst being more conservative with respect to stigmatised variants. However, Ross (2024) suggests that the prestige status of some vowel variants may be changing, given the broad diphthong productions of some older female speakers in the Auckland Voices dataset. She also suggests that younger speakers in the Auckland Voices dataset show fewer gendered differences in pronunciation than the older generation.

1.3.4 Ethnicity and variation

The main ethnic variety that has been the focus of sociolinguistic research in New Zealand is usually described as 'Māori New Zealand English' (e.g. Warren and Bauer 2004), an inherently umbrella term due to the geographical and cultural breadth of New Zealand's Māori community. Warren and Bauer (2004) also note that much of what New Zealanders perceive to be 'Māori accents' is attributable to broad accent features, a result of the intersection of structural racism and economic deprivation in colonial New Zealand. However, features that Warren and Bauer do consider specific to Māori NZE include fronted KIT, retracted START, fronted GOOSE, and a more monophthongal FLEECE, as well as more frequent devoicing of [z]. Warren and Bauer propose that this fronted and raised KIT possibly stems from the phonology of te reo Māori, where <i> is pronounced [i] (2004:617). Additionally, Kennedy (2006) and Marsden (2017) both find lower use of linking /r/ by Māori participants in their research (see section 1.5.2)

An innovative variety of NZE is developing in Auckland's Pasifika community, which has grown dramatically in Auckland throughout the past century. In the late 2000s to mid 2010s, Starks and colleagues (Starks 2005, 2008; Starks et al. 2015) investigated the NZE spoken by Māori and Pasifika students at a school in Auckland. The recordings were made in 2001, and contain read speech from students aged 10-13 years. Many of the students demonstrate degrees of lowering in both DRESS and TRAP, as well as a high front variant of KIT, [i], by some speakers. Even the more centralised KIT tokens in their data are not entirely

typical for NZE, represented as [ɨ̞], with none so centralised as [ə] or [ʌ]. They interpret their results as a shift in the direction of canonical NZE by successive generations of Pasifika New Zealanders, with KIT at a more advanced state than either DRESS or TRAP. This fronted and raised KIT, similarly to the variant found in Māori NZE discussed above, may be the product of contact with the vowel systems of Polynesian languages: all students participating in the research by Starks and colleagues were enrolled in bilingual education programs, and in addition to NZE spoke at least one Polynesian language (Niuean, Samoan, Tongan, Cook Island Māori, or New Zealand Māori), each of which have a close front short vowel with a realisation similar to [i]. Outside of vowel variation, Kennedy (2006) also found TH-fronting and lower usage of linking /r/ to be a feature of Pasifika teenagers in the Auckland region. Another feature which is becoming particularly associated with Pasifika New Zealanders is rhoticity in the NURSE lexical set, which is discussed in more detail in section 1.5.3.

1.4 Vowel features of New Zealand English

The vowel system of NZE is arguably the most salient feature of the dialect to both naïve listeners and linguists. Figure 1.5, adapted from the IPA illustration of NZE by Bauer and colleagues (2007:98), shows the monophthong system of standard NZE, with IPA representation and lexical set description (from Wells 1982).

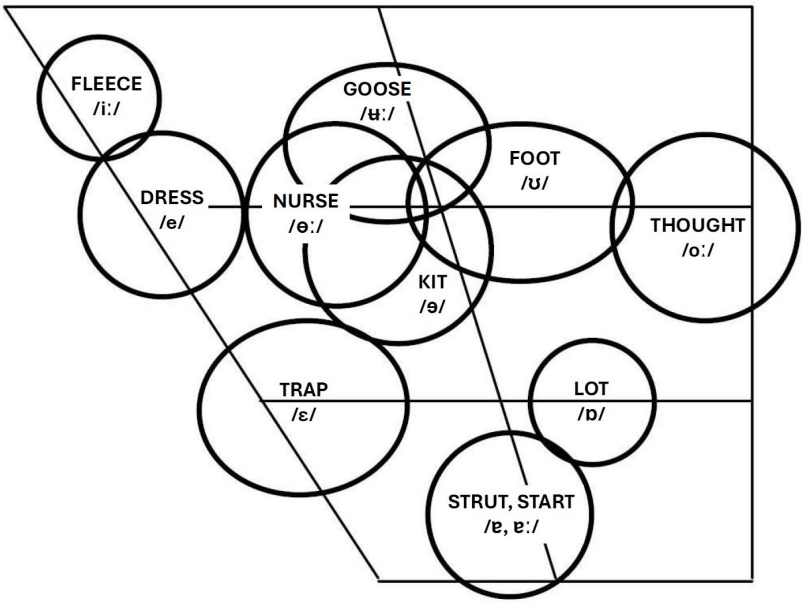


Fig. 1.5 Monophthongs of standard NZE, adapted from Bauer et al. (2007:98)

1.4.1 Short front vowels

Figure 1.6 shows a schematisation of the approximate developments of NZE monophthongs during the 19th and 20th Centuries:

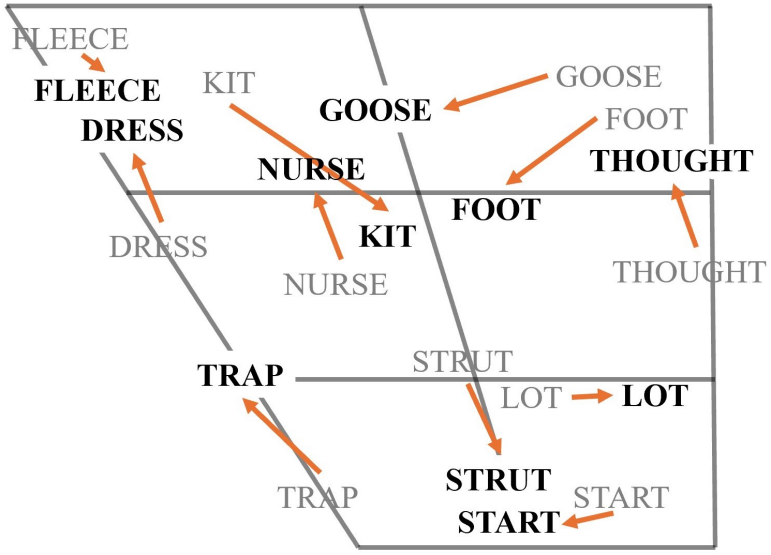


Fig. 1.6 Approximate developments of monophthongs during the course of dialect formation

The short front vowels of NZE are markedly different from those of British and American Englishes. This is largely due to a push-wise chain shift which occurred early in the accent's development. Gordon et al. (2004) propose that this push-chain began with the fronting of START and raising of TRAP, followed by the raising of DRESS, and centralisation of KIT. Brand et al. (2021) provide an impressive visualisation of the movements of the short front vowels throughout the ONZE corpus speakers, reproduced in figure 1.7 overleaf.

1.4.1.1 TRAP

The raising of TRAP in early NZE is the first stage of the short front vowel shift that is observable in speakers from the ONZE corpus. Raised TRAP in NZE appears to have arisen from the raised TRAP vowel present in the south of England in the 19th Century (Gordon et al. 2004:102). Gordon et al. argue for this push-chain ordering due to the prevalence of TRAP raising in early speakers in the ONZE corpus, compared to other vowels affected by the shift (DRESS and KIT). Brand et al. (2021) show this ordering with acoustic analysis: as can be seen in figure 1.7, the raise in F1 frequencies for TRAP in speakers born c.1860-1890 is steeper in gradient than the raising of DRESS, and the rise also plateaus in speakers born from 1975 onwards.

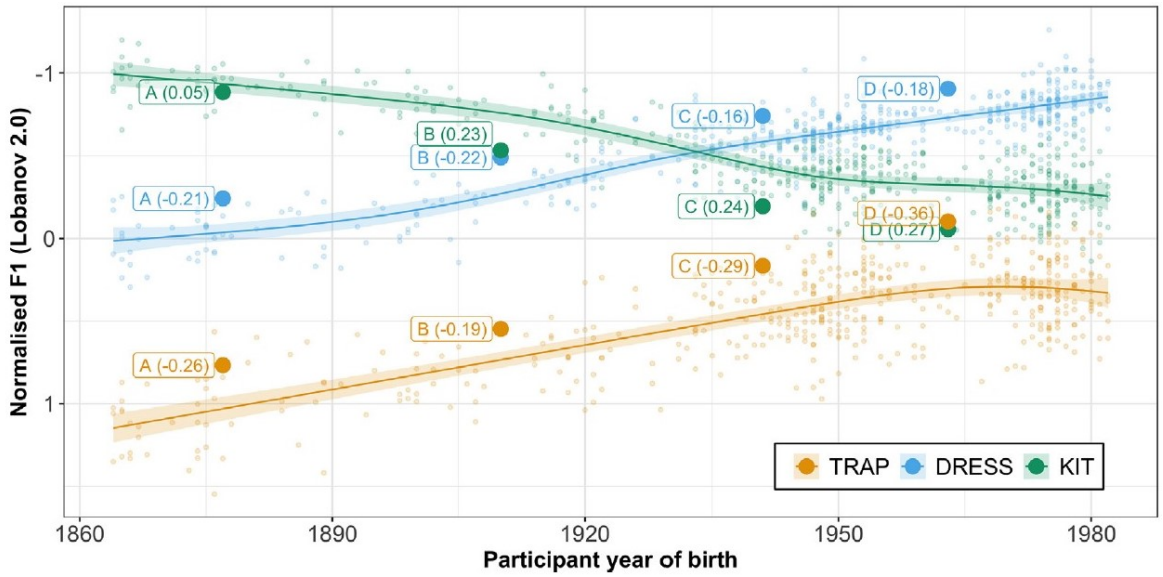


Fig. 1.7 The short front vowel shift, reproduced from Brand et al. (2021:9)

The plateauing of TRAP height visible in figure 1.7 is also noted by Ross and colleagues in the AVP's young Auckland speakers (Ross 2018, 2024; Ross et al. 2021, 2023), where TRAP is not only plateauing, but is beginning to lower in younger speakers. This same lowering is visible in the QuakeBox speakers visualised by Hurring and Clarke (2025) in figure 1.2, but was not found to be statistically significant in the later analyses by Hurring et al. (2025), meaning that TRAP-lowering in the Canterbury area is not clearly demonstrable. Ross (2024) also investigates the height of TRAP in her young Nelsonian speakers, with ambiguous results: they are not producing TRAP significantly differently from older Nelsonian speakers (at $p = 0.024$, this result is marginally above Ross's significance level of $p = 0.01$), but the value of TRAP for young speakers in Nelson is not significantly different from their Auckland counterparts Ross concludes that TRAP in Nelson may be beginning to lower, but to a lesser level than in Auckland.

Starks and colleagues interpret the lowered and retracted TRAP in their Pasifika participants (see section 1.3.4) as being a non-NZE feature that is lost over successive generations after migration to New Zealand. Alternatively, Ross et al. (2021) suggest that these vowel features are in fact the result of speakers' status as linguistically innovative Aucklanders, rather than being a feature of a more conservative Pasifika NZE.

1.4.1.2 DRESS

Following TRAP-raising in early NZE, DRESS became significantly raised (see figure 1.7). This raising is already present in the earlier speakers in the ONZE corpora, but to an impressionistically lesser extent than raising of TRAP (Gordon et al. 2004:114). Though Bauer et al. (2007) represent DRESS as lower than FLEECE in their IPA illustration (see figure 1.5), DRESS is as raised as FLEECE for many (particularly female) speakers (Maclagan and Hay 2004, 2007; McKenzie 2005). In the QuakeBox speakers from figure 1.2 (Hurring and Clark 2025), FLEECE and DRESS can be seen to have near-identical normalised height in the youngest speakers (born around 1995), and in Hurring et al. (2025), DRESS was found to still be raising in speakers from this age group. DRESS-raising was also found by Viollain and Durand (2020) to be continuing in speakers born between 1990 and 1992. Therefore in the south of the country, the most recent acoustic studies show DRESS as still raising, or at the very least plateauing.

However, Ross (2018, 2024; Ross et al. 2021, 2023) presents evidence that DRESS may not still be raising in Auckland speakers. She finds statistically significant lowering of DRESS in her under-25 Aucklander group, and interprets this as an apparent reversal of DRESS-raising in NZE. Whether this is a regional feature of Auckland only is unclear, since there is little investigation of DRESS vowels in speakers born in the 21st century, with QuakeBox being the only notable exception (see figure 1.3). Ross (2024) does not find any evidence of DRESS-lowering in her Nelson dataset, though once again the DRESS vowels of young Nelsonians were not found to be statistically significantly different to DRESS vowels of young Aucklanders. Unlike TRAP, however, the cross-generational difference in DRESS vowels in Nelson was not even marginally significant. Therefore, Auckland is currently the only location in New Zealand with any demonstrated lowering of DRESS.

1.4.1.3 KIT

Following the DRESS-raising and TRAP-raising described above, KIT began to centralise in NZE, becoming significantly lowered and retracted compared to other English varieties. In the earliest speakers of the ONZE corpus, Gordon et al. (2004:188) show lower rates of KIT-centralisation, with only 7% of speakers producing KIT with a centralised quality. They suggest that centralised KIT, which became much more prevalent in the 20th Century, is therefore not a result of original dialect input during settlement, but rather the result of the shifts in TRAP and DRESS. KIT-centralisation is a feature of 'broad' NZE (see section 1.3.2), and as a result has faced stigmatisation in a way that the changes to DRESS and TRAP have

not. Indeed, Ross (2024) finds that while older Nelsonian speakers have a very centralised KIT vowel, lower than their TRAP realisations, this is not the same for younger Nelsonian speakers or either age group of Auckland speakers, suggesting that younger speakers are avoiding the stigmatised central variant.

Unlike the other short front vowels, KIT does not appear to be undergoing any reversal of direction in Auckland. Though the hyper-centralised variant is not present in the AVP speakers, there is no sign that the more general centralised variant is becoming fronted or raised by younger speakers (Ross 2018, 2024; Ross et al. 2021, 2023). However, in the recent analysis by Hurring et al. (2025), KIT was found to be fronting and raising in younger speakers from the QuakeBox corpus, particularly younger women. Also investigating the QuakeBox dataset, Blackwood (2022) found that some kindergarteners (born 2008-9) had uncharacteristically high front KIT vowels, but only those who attended kindergarten in an area with relatively high proportions of Māori and Pasifika residents.Indeed, as noted in section 1.3.4, fronted and raised KIT is a notable feature of both Māori and Pasifika Englishes in New Zealand. Findings for KIT in Auckland and Christchurch conflict – if KIT were participating in a reversal of the short front vowel shift, then reversal should be present in Auckland, but this does not appear to be the case. Conversely, in Nelson and Christchurch, two locations that as of yet are not clearly participating in any reversal of DRESS- or TRAP-raising, KIT appears to be reversing in direction. The presence of fronted and raised KIT in Māori and Pasifika speakers, as well as the association of hyper-central KIT with stigmatised broad accents, set KIT apart from TRAP and DRESS, which do not carry such socially indexed variation.

1.4.1.4 Short front vowel lowering: a cross-dialectal change?

The lowering of TRAP and DRESS in NZE is mirrored in a set of changes taking place across the Anglophone world. As is noted by Gordon et al. (2004), raised TRAP was present in British English in the 19th and early 20th Centuries, reaching qualities approximating [ɛ] in RP speakers. Wells (1982) notes that some younger speakers of RP have a lowered TRAP vowel, with realisation closer to [a] than the expected mid-20th Century [æ]. TRAP- and DRESS-lowering in RP/Southern Standard British English (SSBE) were shown in an apparent time study by Hawkins and Midgley (2005), with TRAP-lowering demonstrably advanced compared to DRESS-lowering (2005:186). This vowel lowering can also be seen longitudinally in the Christmas addresses of the late Queen Elizabeth II, whose speech shifted gradually away from 'ultra-conservative' RP over the course of her reign (Harrington et al.

2000), and can also be seen lowering in the pronunciations of British classical singers in both Cambridge and Glasgow over the past 80-100 years (Marshall et al. 2024).

This same lowering of TRAP and DRESS is very well evidenced in NZE's closest relative, Australian English (AusE). Cox (1996) notes TRAP-lowering in speakers born in the late 20th Century, and Cox and Palethorpe (2008) show significant TRAP- and DRESS-lowering in female speakers born after 1975. In further investigations, Cox et al. (2024) show the lowering to still be progressing in speakers born from the mid-1980s and later. Much like the findings for RP/SSBE, TRAP is shown to lower before DRESS in AusE: Cox et al. (2024:9) show TRAP to be lowered between the 1960s and 1990s, while DRESS is still raising to a significant level in this time period, only lowering post-1990.

Short front vowel lowering is also documented in further varieties of English, including Californian English (Eckert 2008), Canadian English (Clark et al. 1995; Boberg 2005), South African English (SAE) (Chevalier 2016), Irish English (Hickey 2003, 2016), and Scottish English (Holmes-Elliot and Smith 2018). Hickey (2018) describes the change as 'supraregional', and suggests that it is diffusing outwards from California as a result of American English's cultural capital in the global age. However, this does not account for TRAP-lowering in RP/SSBE in the early 20th Century, so a single-origin diffusion pattern seems unlikely.

1.4.2 START and STRUT

START and STRUT form a length pair in NZE (Warren 2006, 2018; Watson et al. 1998). The pair are more front in quality than in other varieties of English, including AusE, which also has the two vowels as a length pair (Watson et al. 1998; Easton and Bauer 2000). START fronted early in the history of NZE (Watson et al. 2000), to the point that even the earliest speakers in the ONZE corpus have a fronted START vowel (Brand et al. 2021). Trudgill (2004:63) provides evidence from the Survey of English Dialects showing that the retraction of START to [ɑː] in the early 19th Century was largely restricted to south-east England and Birmingham, whereas the majority variant elsewhere was still [aː]. Trudgill (2004:117) later argues that the absence of START-retraction in NZE and AusE is a direct result of the fronted variant's majority position during koinéisation.

Ross (2018, 2024) does not identify any change in START occurring in either Auckland or Nelson. However, the later ONZE speakers included in Brand et al. (2021), the visual data from QuakeBox (see figure 1.2), and the statistical analysis of QuakeBox by Hurring

et al. (2025) all suggest that in the last few generations, START has begun to retract. If this represents a point of regional variation, where more southern Christchurch is showing START-retraction but more northern Nelson and Auckland are not, then Wellington would be predicted to follow Auckland and Nelson, with no START-retraction.

Brand et al. (2021) show early speakers in the ONZE corpus to have a very central STRUT quality, which is lowered over apparent time to form the length pair with START. This lowering appears to have plateaued around 1950 in their data, and is not shown to continue in data from QuakeBox (Hurring and Clark 2025; Hurring et al. 2025). Indeed, in their recent analysis of the wider QuakeBox corpus, Hurring et al. (2025) show younger male speakers undergoing significant STRUT-retraction, visible in figure 1.2. Contrastingly, Ross (2024) finds significant STRUT-fronting in both Auckland and Nelson speakers, which she notes does not have precedent in any other established sound changes in NZE. Once again, Christchurch appears to be an outlier, and Wellington would be predicted to pattern with Auckland and Nelson in showing fronted STRUT, given Ross's findings.

1.4.3 NURSE

The NURSE vowel in NZE is raised, fronted and rounded compared to most other varieties of English. Maclagan et al. (2017) provide evidence that NURSE has been rounded in the variety for a long time, having been described by McBurney, an elocution teacher, in the late 1880s. However, it is not clear where this rounding came from, as NURSE-rounding has not been noted as a common feature in NZE's input varieties. Over the course of the 20th Century, NURSE fronted and raised significantly in NZE, to the point that for some speakers it appears to occupy the same position as GOOSE in the vowel space (Warren, 2018). There is little evidence of a NURSE-GOOSE merger, though Bauer and Warren (2004:591) note the existence of personalised numberplates like *2MIN8OR* that exploit the overlap of the two vowels. NURSE shows a significant amount of social variation in NZE: Warren (2018) shows that women consistently have a higher NURSE vowel than men – for female speakers in the NZSED of all age groups, NURSE tended to overlap with GOOSE, whereas males speakers in his study tended to have a lower NURSE quality that overlapped more with that of KIT. This same pattering of NURSE, GOOSE and KIT can also be seen visually in data from QuakeBox (see figure 1.2). This gender effect is generally taken to mean that women have led NURSE-raising in NZE (Warren 2018; Maclagan et al. 2017; Ross 2024). As well as gender variation, NURSE demonstrates some variation by ethnicity: NURSE in Māori NZE is considerably raised and fronted compared to the general NZE (Bell 2000), and some Pasifika

New Zealanders produce NURSE as a rhotacised vowel (discussed in further detail in section 1.5.3 below).

There is evidence to suggest that NURSE is beginning to lower in NZE. Ross (2018, 2024) shows significant NURSE-lowering in younger speakers in Auckland, with no significant gender differences. Interestingly, she also finds this NURSE-lowering in the older speaker group in Papatoetoe, a suburb with a very high proportion of Pasifika residents, but no lowering in their counterparts from Mount Roskill and Titirangi. She found no such suburb differences in the youngest speaker group. Ross (2024) also finds evidence of NURSE-lowering in her Nelson dataset, again without any apparent gender effect. In the visual data from QuakeBox (figure 1.2), NURSE can be seen to lower in the younger generation for both men and women, with a more noticeable retraction in the female speakers. This lowering is found to be statistically significant for both men and women in the recent analysis by Hurring et al. (2025). In the older generations, NURSE is higher for female speakers, but the younger speakers in QuakeBox appear to have very similar NURSE height in both gender groups. Therefore, for the three cities with contemporary corpora (Auckland, Nelson and Christchurch), it appears that NURSE is lowering for both young men and women. Since there is no contemporary corpus for Wellington, it remains to be seen whether the lowering is also occurring there. NURSE has also lowered in younger speakers of AusE (Cox et al. 2024), alongside the short front vowel reversal discussed in section 1.4.1.

1.4.4 FOOT and LOT

FOOT is one of the least frequent monophthongs in NZE (Watson and Marchi 2014). As a result, it has been excluded from several of the major studies of NZE due to low token numbers, including that of Brand et al. (2021), the Nelson speakers in Ross (2024), and the analyses of QuakeBox in Hurring and Clark (2025) and Hurring et al. (2025). The only contemporary observations of FOOT are found in analyses of the AVP dataset, where Ross (2024) shows fronting of FOOT by younger speakers. However, Ross notes that FOOT has two distinct realisations in NZE: the first, conservative variant is closer to [ʊ], whereas the second, innovative variant is represented by Bauer and Warren (2004:589) as closer to [ɨ], notably in the word 'good', as shown orthographically in the prototypical kiwi greeting 'gidday'. Whether this variant is diffusing lexically or allophonically is unclear – Bauer and Warren (2004) suggest that the change is diffusing from 'gidday' to other uses of the word 'good', but make no comment on other lexical items, whereas Ross (2024:16) suggests that the conservative [ʊ] variant is largely found pre-laterally in NZE. However, due to the

exclusion of FOOT from several recent studies of NZE, it is still not clear what the exact phonetic environments for fronted FOOT are, beside the word 'good'.

LOT has remained in a fairly stable position throughout the development of NZE, changing very little in height but backing slightly (Brand et al. 2021). Ross (2018) notes that LOT shows particularly high inter- and intra-speaker variation, which she later suggests may be the result of LOT's relative lack of close neighbours in the vowel space (2024:16). Whilst LOT is not undergoing any demonstrable change in Auckland (Ross 2018, 2024), Ross does find that in her Nelson speakers, LOT is significantly fronted. She does not present an explanation for this fronting, which does not have any analogues in other recent NZE research. In the analysis of QuakeBox speakers by Hurring et al. (2025), LOT was not found to demonstrate any significant age variation in either men or women.

1.4.5 FLEECE, GOOSE and THOUGHT

During the development of NZE, FLEECE has remained at the high front corner of the vowel space (Gordon et al. 2004; Bauer and Warren, 2004; Bauer et al. 2007; Brand et al. 2021). However, FLEECE has developed an onglide that is equally pronounced as that of AusE (Watson et al. 1998), leading Maclagan and Hay (2004, 2007) to suggest that as DRESS raises, FLEECE becomes more diphthongal. They cite Labov's 'upper exit principle' (Labov 1994:602), where in the event of a high-mid vowel encroaching on a high vowel, the high vowel may develop an onglide to maintain phonological contrast. This diphthongisation of FLEECE as DRESS raises is also found by McKenzie (2005) and Warren (2018), though none of these studies demonstrate a direct correlation between DRESS-raising and FLEECE-diphthongisation at the individual speaker level. Ross (2024) shows FLEECE-diphthongisation to be reducing in younger speakers in Auckland and Nelson, though in Nelson this only appears to be occurring in her female participants (2024:125). She also notes that older speakers in Nelson have much more dynamic FLEECE vowels than their Auckland counterparts, suggesting that FLEECE-diphthongisation may be a feature of broader NZE.

As has happened in multiple varieties of English in the 20th Century, GOOSE in NZE has fronted, especially in Māori NZE (Warren and Bauer 2004). Brand et al. (2021) show GOOSE rapidly fronting in speakers born between 1850 and 1925, after which the fronting plateaus considerably. Similarly to FLEECE, GOOSE in NZE has an increasingly present onglide (Watson et al. 1998, Easton and Bauer, 2000, but this diphthongisation is not as prevalent as for FLEECE; Ross (2024) shows little dynamism in either age group of Auckland

speakers, with GOOSE-diphthongisation only present in older Nelsonian speakers and younger Nelsonian men. Again, like FLEECE, this suggests that GOOSE-diphthongisation is a feature of broad varieties and is reversing in younger speakers.

THOUGHT has raised and backed in the development of NZE, to the point that it is now at the high back corner of the variety's triangular vowel space (Gordon et al, 2004:210). Brand et al. (2021) show that in the last 100 years, THOUGHT-raising has plateaued, and has in fact begun to gradually front in speakers born post-1925. THOUGHT has also developed an offglide for some speakers, especially in open syllables and phrase-final position (Bauer and Warren 2004:590). Ross (2024) finds no change in either Auckland or Nelson for THOUGHT.

1.4.6 Diphthongs and unstressed vowels

NZE's diphthongs have also undergone significant change since early settlement. One particularly salient development is that of the NEAR/SQUARE merger, a change that rapidly progressed during the late 20th Century and that was captured in near-real time by Gordon and Maclagan (1989, 2001; Maclagan and Gordon 1996). Interestingly, in the early period of observation, it seemed like the merger was converging on [eə] for both lexical sets (Holmes and Bell 1992), and yet soon after it was clear that SQUARE was, in fact, raising to [iə] and merging with NEAR (Rae and Warren 2002). The merger was not fully complete by the start of the 21st Century, and the pair seem to be more distinct in perception than production (Warren and Hay 2006). It is generally assumed that the merger has continued to progress since the early 2000s, but as Ross (2024) notes, more recent studies of the merger (Ross 2018; Wollum 2020) have investigated relatively small datasets, and so claims about the merger's subsequent completion in the younger generation must be investigated further.

NZE has undergone a merger of the unstressed vowels [ɪ] and [ə], often called the 'villagES–villagERS' merger (Bauer et al. 2007). Bauer and Warren (2004) suggest that this has come about due to the centralisation of KIT to a schwa-like quality. However, Trudgill (2004:199) argues that the merger instead occurred due to the [ɪ/ə] distinction being marked and therefore levelled during new dialect formation. In addition to /ə/ in unstressed syllables, Bauer and Warren (2004) and Bauer et al. (2007) argue for an additional unstressed vowel, being the product of vocalised syllabic /l/. This 'treacLE' lexical set is described as having variable realisations including [ɯ], [o̞], [o], [ʊ], [u], and [ɤ].

1.5 Liquid features in New Zealand English

1.5.1 L-vocalisation

Many English varieties, including SSBE (Wells 1982; Johnson and Britain 2007), AusE (Borowsky and Horvath 1997), and New Zealand English (Bauer et al. 2007), have some form of 'clear-dark' allophony of /l/, regulated by syllable position. In varieties with this allophony, /l/ in the syllable onset is 'clear', produced canonically as [l] with little to no secondary articulation[1], whereas /l/ in the rhyme is 'dark', often represented as velarised [ɫ]. The acoustic and articulatory correlates of l-darkening are complex and not entirely clear, though often appear to involve manipulation of the tongue dorsum (Sproat and Fujimura 1993; Turton 2017; Strycharczuk et al. 2020). In varieties with clear-dark /l/ allophony, [ɫ] often then undergoes vocalisation, losing consonantal articulation and becoming closer to a high back vowel. Rhyme /l/ is becoming more vocalised in multiple varieties of English, including Southern British Englishes (Wells 1982; Hughes et al. 2012; Tollfree 1999; Johnson and Britain 2007; Cole 2022), Glasgow English (Stuart-Smith 1999; Stuart-Smith et al. 2006, 2013), Singapore Colloquial English (Sim 2023), some non-standard dialects of the United States (Pederson 2001), and AusE (Borowsky and Horvath 1997; Horvath and Horvath 1997, 2001, 2002). Since /l/-darkening occurs in any syllable position other than the syllable onset, this means that /l/-vocalisation can appear in the following contexts:

1. Syllabic /l/, for example 'table', 'people'

2. Coda /l/, for example 'feel', 'pull'

3. Cluster /l/, for example 'milk', 'pulp'

L-vocalisation is far from a recent innovation in English's phonological history. From the 17th Century onwards, rhyme /l/ became vocalised in cluster contexts when following a back vowel (Lass 2000), yielding modern standard English words such as 'talk' [tɔːk], 'folk' [fəʊk], or 'palm' [pɑːm].

Outside these contexts, l-vocalisation in English varieties with clear-dark /l/ allophony is still an ongoing change, and is variable across speakers, contexts and registers. Johnson and Britain (2007) present a study of l-vocalisation in East Anglian 'Fenland English', a collection of varieties where clear-dark /l/ allophony is a comparatively recent arrival. They find evidence that l-vocalisation is rapidly progressing in the area, with adolescents producing

[1] In AusE, onset /l/ is not pronounced [l], but is argued by McDougall and Jones (2011) to be 'neutral' in quality, still contrasting with darker /l/ in the syllable rhyme described by Borowsky and Horvath (1997).

around 80% of rhyme /l/ tokens vocalically, as opposed to 25% of tokens for speakers over 50 years. Neighbouring the Fenlands, l-vocalisation is well established in English varieties of London (Tollfree 1999) and Essex, where vocalisation is described as "near-categorical" by Cole (2022). AusE, NZE's close relative, demonstrates low but increasing levels of vocalisation, at 15% of syllabic contexts (Horvath and Horvath 2001:42)

The social stratification of l-vocalisation has not often been investigated, with a handful of exceptions. Horvath and Horvath (2001:40) state that gender is "only weakly associated" with variability in l-vocalisation, though they note "some indication" (p55) of a slightly higher rate among women. Their results report 33% and 32% vocalisation for women and men respectively, a difference below the level of significance. There is no mention of gender in the discussion of Johnson and Britain (2007), Wright (1989), or Tollfree (1999), but Ellingsæter (2014) finds higher rates of vocalisation by men in young Surrey speakers. L-vocalisation in Cambridge English was shown by Wright (1989) to be more frequent in less formal speech styles, and l-vocalisation is generally assumed to be a feature of casual speech across varieties.

Johnson and Britain (2007) find relatively little effect of preceding consonant on the rate of l-vocalisation in Fenland English, although labial consonants are accompanied by l-vocalisation slightly more often in their dataset. In Southend and Colchester, Spero (1996) found no conclusive effect of preceding consonant, aside from the children in the dataset (born from 1985 onwards) who vocalised more frequently after dorsal consonants. For following context, Johnson and Britain observe that there were only two tokens of vocalised /l/ before vowels, with Fenland speakers preferring a clear 'linking' /l/ in contexts such as 'all over'. As they note, this contrasts with London English (Tollfree 1999) and Cambridge English (Wright 1989), as well as AusE and NZE (Horvath and Horvath 2001), where speakers where speakers optionally produce vocalised /l/ in pre-vocalic environments.

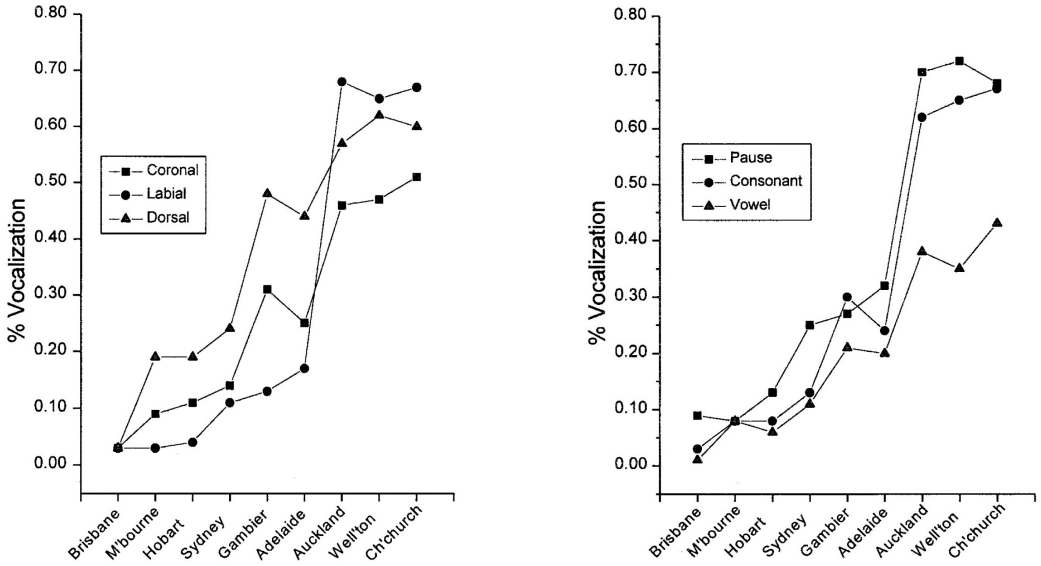
1.5.1.1 L-vocalisation in New Zealand English

L-vocalisation in NZE is suggested by Trudgill (2004:79) to have largely been a post-settlement phenomenon, rather than a transplanted variant from British varieties. The evidence for this claim, once again, is from the early speakers in the ONZE corpus, described by Trudgill as having very minimal l-darkness and "little or no" l-vocalisation. However, vocalisation has been considered a standard feature of the dialect for some time (Bauer 1986, 1994; Bauer and Warren 2004; Bauer et al. 2007), and appears to have been described in a

phonetic account of 1920s NZE, recently rediscovered by Ross (Thompson 1921; quoted in Ross 2024).

Though often mentioned in conjunction with AusE, l-vocalisation appears to be a more established change in NZE. In the early 2000s, Horvath and Horvath (2001, 2002) showed significantly higher rates of vocalisation in speakers in Wellington, Auckland, and Christchurch than six major Australian cities (Sydney, Melbourne, Brisbane, Adelaide, Mount Gambier, and Hobart). They also note that syllabic /l/ is most likely to be vocalised in NZE, at 58% of tokens, as opposed to AusE, at 15% of tokens (2001:41). Kennedy (2006:67) suggests that Horvath and Horvath's figures for overall vocalisation rate in NZE may remain an underestimate, finding in a study of teenagers born in 1989-1990 that 84% of coda /l/ tokens were vocalised in her dataset, drawn from informal interviews at schools around the country.

Horvath and Horvath (2001) show that rates of l-vocalisation by syllable position vary between AusE and NZE. Syllabic and clustered /l/ are far more likely to be vocalised by New Zealand speakers than AusE, where coda /l/ is the most frequently vocalised. Horvath and Horvath also found the effect of preceding and following environment to differ substantially between Australian and NZE, reproduced in figure 1.8 below.



(a) Preceding environment (b) Following environment

Fig. 1.8 L-vocalisation by environment in AusE and NZE (Horvath and Horvath 2001:46-47)

Preceding labials are the most preferred vocalisation environment in NZE, but the least preferred environment in AusE. After labial consonants, Horvath and Horvath find that

dorsal consonants are the next most preferred vocalisation environment in NZE, and coronal consonants the least preferred. Following environment did not differ drastically between varieties, with pauses being the most frequent vocalisation environments and vocalisation before vowels being comparatively dispreferred. However, vocalisation before following vowels still occurred around 40% of the time in NZE, a rate that is far higher than Johnson and Britain's findings for Fenland English, and that is more comparable to London and Essex speakers.

As a result of their findings for phonetic environment and overall vocalisation levels, Horvath and Horvath propose a "path of development" for l-vocalisation (2001:42), using their results from the nine cities across Australia and New Zealand and placing Christchurch, the city with the highest rate of total vocalisation, at leading end of the 'pathway'. They suggest that increaed overall rates of vocalisation are is connected to higher vocalisation rates of syllabic and clustered /l/, as well as vocalisation before vowels, and a stagnation in the rate of coda /l/ vocalisation.

Vocalised /l/ appears to be interacting with other phonetic features of NZE, especially pre-lateral vowel mergers such as the *salary-celery* merger, and variable mergers of back vowels, sometimes including centralised KIT (Bauer and Warren 2004:584). In addition, Bauer and Bauer (2002) tentatively suggest that the merger of pre-lateral FOOT and THOUGHT is particularly advanced in central New Zealand, since the popular playground game 'bull-rush' is increasingly spelled as 'ball-rush' in this region. Bauer et al. (2007:99) describe vocalised /l/ as the "usual" realisation in their IPA illustration of NZE, above velarised [ɫ]. They also propose a new phonemic diphthong: GOLD lexical set, with canonical realisation /ɒɯ/, though once again it is noted that impressionistically the vocalised /l/ occupies a wide variety of vowel space locations between speakers.

Despite its high prevalence, there remains little folk awareness of vocalised /l/ amongst New Zealanders. Hay et al. 2008:35) note that aside from the occasional prescriptivist letter from disgruntled readers of the NZ Listener, such as a complaint about seeing "Warnuts for sale" on a roadside sign in 1995, speakers seem largely unaware of l-vocalisation as a phenomenon, and there appears little, if any, social stigma attached to vocalised variants. However, there is a relationship between social class background and use of vocalised /l/, at least in the Canterbury Corpus. Gordon and Maclagan (2008) give the estimate that women from a higher social class background in the corpus produce /l/ consonantally around 60% of the time in the wordlist data, but that younger speakers from lower social class backgrounds

use the vocalised variant in around 70% of instances in wordlist data. In line with Wright (1989) and Horvath and Horvath (1997, 2001, 2002), as discussed above, they also state an effect of speech style, suggesting l-vocalisation rates to be higher in casual speech, though they provide no figure here. In post-interview discussion with participants in the present study, speakers appeared unaware of their own production of /l/, and didn't generally offer any opinions on vocalised /l/, whereas they did to a much greater extent on vowel sounds or rhoticity when asked about these features.

1.5.2 R-liaison

R-liaison is a phenomenon common to many English varieties that have experienced a decline in rhoticity, such as non-rhotic British Englishes (Bauer 1984; Brown 1988; Foulkes 1997; Allerton 2000), AusE (Cox et al. 2014; Penney et al. 2024) and NZE (Sudbury and Hay 2002; Hay and Sudbury 2005; Hay and Maclagan 2012). The liaison involves the production of post-vocalic /r/ in vowel hiatus contexts and where this post-vocalic /r/ is etymological (i.e. would be pronounced by fully rhotic speakers), this is referred to as 'linking /r/'. For example, the phrase *car alarm* would be produced [kɐːɹəlɐɹm] by a rhotic speaker, but [kɐːəlɐːm] by a non-rhotic speaker with linking /r/. R-liaison can also occur following non-high vowels in open syllables where there is no etymological /r/, such as in the phrases *law and order*, or *fella over there*. R-liaison in these contexts is referred to as 'intrusive /r/', due to its non-etymological origins.

R-liaison is considered almost categorical in some varieties, such as Norwich English (Trudgill 1974) and in Derby (Foulkes 1997). However, in some British Englishes it appears that r-liaison is undergoing a slight decrease, with an increase in glottal stops replacing /r/ as hiatus resolution strategies (e.g. [kɐːɹʔəlɐːm]). Foulkes (1997) notes that in Newcastle English, where linking /r/ is falling out of usage, this glottal variant is more common when the second word is stressed. Allerton (2000) finds a decrease in linking /r/ in British news presenters throughout the 1990s, again with glottal stops being used increasingly often. In a further study of BBC newsreaders between 1999 and 2009, Mompéan and Garzon (2011) find that on average, around 60% of linking opportunities involved /r/, with around 30% being glotallised instead. In AusE, linking /r/ usage does not seem to be changing in this direction (Cox et al. 2014; Penney et al. 2024), though Cox and colleagues do find a slight trend away from linking /r/ in the same prosodic environment as Foulkes (1997), where the second word is stress-initial.

Bauer (1984:77) claims that linking /r/ is not distributed in a "Labovian" way, with "little evidence" for socially conditioned variation by gender, age or style found in his data. However, as discussed above, some British dialects do demonstrate age variation, and Foulkes (1997) also found an effect of social class on r-linking rates in his Newcastle speakers, with middle-class speakers producing higher rates of linking /r/. Foulkes does not find any effect of gender in his study, but Bauer (1984) does have a marginally significant gender trend in his study, with men producing slightly more linking /r/. Style has been shown to have an effect on r-liaison, with both linking and intrusive /r/ being less frequent in careful speech (Allerton 2000; Mompéan and Garzon 2011). Though linking /r/ is not a stigmatised variant, Bauer (1984) suggests that intrusive /r/, being non-etymological, is stigmatised, and that suppression of intrusive /r/ in careful speech can lead to lower production of linking /r/.

1.5.2.1 R-liaison in New Zealand English

Sudbury and Hay (2002; Hay and Sudbury 2005, 2012) follow the emergence of r-liaison in NZE through the ONZE corpora. Their findings show that as general levels of rhotacism declined from the mid-19th Century onwards, non-prevocalic /r/ declined to a lesser extent in linking contexts, eventually plateauing. They also find that amongst these early speakers, men were significantly more likely to produce /r/ in linking contexts, though this figure does not distinguish between rhotic and non-rhotic speakers. There is also an effect of lexical frequency, where more common words and collocations demonstrated a higher rate of linking /r/ in the corpus.

Marsden (2017) also investigates linking /r/ in her study of rhoticity in regional towns in the North Island. She finds that teenagers (born around the turn of the millennium) tend to produce fewer instances of linking /r/, at around two-thirds of all opportunities, compared to older adult speakers who articulated around 80% of linking /r/ opportunities. Marsden finds no effect of gender, but does find an effect of location, with the more southern of the two towns producing significantly more linking /r/. She also finds that there is a significant inverse correlation between a speaker's production of rhoticity and their production of linking /r/, and suggests that they may be in a causal relationship. Kennedy (2006), in her study of teenagers across New Zealand, finds that linking /r/ usage is best predicted by lexical frequency, followed by ethnicity and socioeconomic status. The highest proportions of linking /r/ usage were found in schools in economically privileged areas, or with low proportions of Māori and Pasifika students. Kennedy also suggests a slight effect of geography, with schools in the central North Island producing linking /r/ less often than their counterparts elsewhere.

Therefore, it seems that linking /r/ is subject to a degree of socially-stratified and geographic variation in NZE.

1.5.3 Rhoticity

1.5.3.1 'Non-rhotic' Englishes

Rhyme /r/ was lost in many dialects of British English during the early Modern period: on the basis of contemporary descriptions, Lass (2000) suggests this deletion to have been largely complete in London around the end of the 18th Century. Rhoticity is considered to have survived for much longer in other parts of Britain, and indeed in prestige speech from London. Trudgill (2004:70) collates evidence from dialect surveys of speakers born in the mid-19th Century, showing that in 1860 most of England was still rhotic, with the exception of London, parts of Norfolk, and areas in the Northeast and East Midlands. Since then, most varieties in England have lost their post-vocalic /r/, with rhoticity becoming increasingly stigmatised.

Although SSBE, SAE, AusE and NZE are typically considered "non-rhotic", /r/ can still be produced post-vocalically in liaison contexts, as discussed above. This contrasts with some dialects in southern America, where r-liaison is not present, and /r/ can even be deleted in intervocalic position before unstressed vowels, such as in the words *very* or *parent* (Harris 2013:333). On the basis of this non-binary distribution of rhoticity and r-liaison, Harris proposes a tripartite typology of rhoticity in English. The three systems are:

R1 "basic rhotic": Post-vocalic /r/ before consonants and pauses.

R2 "narrow non-rhotic": Post-vocalic /r/ only before vowels.

R3 "broad non-rhotic": No post-vocalic /r/, some deletion of intervocalic /r/.

Under this typology, SSBE, AusE, NZE and SAE would all typically be considered to be in system R2, though if SSBE is indeed moving away from r-liaison then it could be said to be approaching system R3.

Progression along Harris's de-rhotacisation cline is not always unidirectional. In several American dialects, rhoticity has historically been lost. Many of these varieties have since experienced a 're-rhotacisation' due to contact with General American English, the prestige variety in the United States. Labov (1966, 1972) famously investigated this phenomenon in New York City, showing an association between the perceived prestige of certain department

stores and the level of rhoticity used by their staff. More prestigious locations were associated with higher rhoticity, as were citation-form style repetitions of the phrase *fourth floor*. Since then, rhoticity has been increasing in the city, with younger female speakers leading the change (Becker 2014). Similar re-rhotacisation effects have been shown in Boston by Irwin and Nagy (2007) and Alabama (1990), and in all three locations speakers with higher socioeconomic status appear to be leading the change. Another consistent pattern across these three locations is that the NURSE lexical set leads in re-rhotacisation, whilst unstressed lettER lags behind. Similarly to de-rhotacisation, re-rhotacisation diffuses along both social and linguistic pathways.

1.5.3.2 Rhoticity in New Zealand English

NZE has not always been non-rhotic. Due to the presence of Irish, Scottish and Cornish immigrants as well as some remaining rhoticity in other non-standard British dialects, early European New Zealanders were more likely rhotic than not. Trudgill (2004:68) states that 92% of the Mobile Unit speakers in the ONZE corpus had "some degree" of rhoticity, a figure that would suggest a high prevalence of rhoticity in the first-generation immigrants who arrived from Britain. However, the lower limit for what Trudgill considers "some degree" of rhoticity is unspecified. In a later paper, Trudgill and Gordon state that a speaker who produces even 1% possible tokens of non-prevocalic /r/ is "most definitely rhotic" (2006:240). If this is how Trudgill reaches his 92% figure, then this is perhaps not so shockingly high. In Hay and Sudbury's analysis of 65 speakers from the same dataset, only five speakers produce postvocalic /r/ in over 30% of possible environments, and the majority have rhoticity levels under 10% (Hay and Sudbury 2005:806). In the early generations of NZE, optional rhoticity does appear to have been present in most speakers, but non-rhoticity was nevertheless the majority form.

As discussed in section 1.3.1, rhoticity has been retained in Southland NZE, and is generally attributed to the influence of Scottish language and culture on the region. However, rhoticity in Southland is undergoing change, moving gradually towards the distribution of rhoticity in standard NZE (i.e., Harris's system R2). Bartlett (2002) provides evidence that younger speakers of Southland English (born from 1980 onwards) are losing postvocalic /r/ in most phonetic contexts (following NORTH, START, NEAR, SQUARE, PRICE, FACE, MOUTH, and CURE), with the exception of NURSE in stressed syllables and lettER in unstressed syllables. Barlett (2002:118) also notes that the apparent increase in rhoticity for younger speakers in urban Southland (Invercargill) is almost exclusively driven by a rise in

frequency of NURSE-rhoticity, similar to the pattern noted in dialects of American English with re-emergent rhoticity discussed above.

In other parts of New Zealand, there are also changes occurring with post-vocalic /r/. In a small study of a school in South Auckland with a high proportion of Māori and Pasifika students, Starks and Reffell (2005) found infrequent but present post-vocalic /r/ in a read passage. Tokens were largely in the name *Arthur*, raising questions of orthographic influence due to the lack of spontaneous speech data in the study. Though Starks and Reffel noted only a small proportion of rhoticity in their study (3.6%), the presence of NURSE-rhoticity in a Pasifika hip-hop album was found by Gibson (2005) to be near-categorical, at 94% of tokens. NURSE-rhoticity was also found to be a regionally and ethnically distributed feature in Kennedy's (2006) analyses of young teenagers' speech in South Auckland and Northland (a rural region north of Auckland), in schools with a higher percentage of Māori and Pasifika students. Kennedy (2006:31) also tentatively suggests that sporadically rhotic lettER tokens found in some of her South Auckland data may represent an innovation in this region, as opposed to the conservative nature of rhotic lettER in Southland. More recently, Ross (2024:201-207) describes some speakers in her Auckland dataset as being semi-rhotic, also largely due to NURSE-rhoticity, further supporting the notion of increasing rhoticity in NZE extraneous to Southland. Marsden (2017), in a discussion of NZE's sporadic rhoticity, notes that American loanwords such as *gangster* and, intriguingly, the proper name *Ireland*, are often produced with non-prevocalic /r/ by otherwise non-rhotic speakers. In her study of two North Island towns, 39 of her 54 speakers (72.2%) had at least one instance of non-prevocalic /r/, but overall token numbers were very low and represented around 1% of all possible contexts. She suggests that general NZE's status as 'non-rhotic' should be reevaluated, especially given Trudgill and Gordon's aforementioned assertion that producing even 1% of possible /r/ tokens constitutes rhoticity (Trudgill and Gordon 2006).

1.6 Interim summary and research questions

1.6.1 Monophthongs

NZE's development as a new dialect has been largely characterised by its vowel systems, especially the changes to the short front vowels, the raising and rounding of NURSE, and the development of a triangular vowel space cornered by FLEECE, START and THOUGHT. However, there is evidence that TRAP, DRESS and NURSE are lowering in Auckland, and potentially beginning to lower elsewhere, suggesting that the canonical developments of 20th Century NZE are not necessarily being continued forward by the youngest generations of New Zealanders. Conflicting findings for START and STRUT between Christchurch and Auckland/Nelson are difficult to reconcile without proposing a regional division that would contradict Bauer and Bauer's proposed linguistic areas for New Zealand (see section 1.3.1). As there is no major corpus from the Wellington area that features includes speakers born post-1990, it is currently unclear to what extent vowel lowering is occurring in Wellington.

Monophthongs: Research questions

1.1 Are short front vowel changes such as TRAP- and DRESS-lowering occurring in younger Wellington speakers, and what does this reveal about the progression of short front vowel lowering through New Zealand?

1.2 Can an investigation of START and STRUT in Wellington reconcile the conflict between findings of STRUT-fronting in Auckland and Nelson, and potential STRUT- and START-retraction in Christchurch?

1.3 Does 21st Century Wellington English behave comparably to other recent findings elsewhere in New Zealand? For example, does it exhibit NURSE-lowering, FOOT-fronting, and stability in other monophthongs?

1.6.2 L-vocalisation

The progression of l-vocalisation through NZE has seen relatively little documentation since the early 2000s, when it was estimated to occur at high levels (80% or above) in casual speech, and it is assumed by many to be approaching categorical status, as has happened in some British varieties. However, much like short front vowel raising, it may be worth examining whether this change, assumed to be unidirectionally advancing in NZE, is indeed progressing in the same manner as 20 years ago.

L-vocalisation: Research questions

2.1 Are rates of l-vocalisation still increasing in Wellington?

2.2 Does l-vocalisation in Wellington demonstrate gendered or stylistic variation?

2.3 How does l-vocalisation interact with syllable position and phonetic environment in Wellington?

1.6.3 R-liaison

NZE is generally considered to belong to Harris's (2013) "R2" system, with no pre-consonantal or pre-pausal coda /r/, and r-liaison in vowel hiatus contexts. Use of linking /r/ has been suggested by Marsden (2017) to be decreasing in NZE, and r-liaison has also been shown to vary by social factors throughout NZE's development and into the modern day.

R-liaison: Research questions

3.1 Are rates of linking /r/ changing in Wellington?

3.2 Does linking /r/ usage in Wellington demonstrate with gendered or stylistic variation?

1.6.4 Rhoticity

Despite most canonical accounts of NZE stating that the variety is non-rhotic north of Southland, NURSE-rhoticity is a major innovative feature of Pasifika NZE in the north of the North Island, and sporadic rhoticity in particular lexical items is noted for many NZE speakers. Wellington is not an area of New Zealand typically considered to have any rhoticity, but it has also not been represented in corpora for the past two decades, roughly the same period in which partial rhoticity has become well-established in some Auckland speakers.

Rhoticity: Research questions

4.1 Do any speakers in Wellington demonstrate rhoticity that conflicts with New Zealand English's description of "non-rhotic"?

4.2 If so, how do they compare to rhotic speakers in the far north and south?

Chapter 2

Method

2.1 Recruitment

Participants were initially recruited through the author's social network, and subsequently recruited through flyers shared by previous participants in their workplaces and church communities, on local notice boards, and through social media. Participants were aware that the study was investigating "Wellington accents" but were not informed about any particular aspects of language under investigation.

2.2 Participant group

The sample group for this project consists of 37 speakers, all of whom were asked to confirm prior to participating that they were "raised in Wellington and had spent most of their life in Wellington". 17 participants had lived elsewhere as adults, both elsewhere in New Zealand (nine participants), and overseas (eight participants). Of these 17 participants, the average time away from Wellington was around four years. seven participants had lived outside Wellington during childhood, either elsewhere in New Zealand (three participants), or in either the UK or US (four participants). Of these seven participants, the average time away from Wellington as a child was 2.2 years.

Participants were asked to fill in their age and gender in the pre-interview demographic questionnaire. Age ranged from 19 to 84 years, with a mean of 41.6 years and a median of 35 years. The ten youngest speakers were all below 28 years old, and the ten oldest speakers were all over 50 years old. Gender was left as an open question rather than a 'male/female'

tick box, though no identities outside male or female were expressed by the participants. In total, 15 male speakers (40.5%) and 22 female speakers (59.5%) were interviewed.

The first five participants were asked to fill in "Ethnicity" on the initial demographic questionnaire, but nearly all of these participants expressed strong views on the redundancy or divisiveness of ethnicity as a concept in contemporary New Zealand. Though these views may not have been shared by all participants, the more neutral and open ended question "describe your cultural and linguistic background" was used for the remaining interviews, as the first approach had largely led to vague answers. If any participants asked for clarification about this question, it was then elaborated as asking about the community in which they grew up, any heritage language backgrounds, and anything else social that they felt may be relevant to their accent. Among the 29 participants who mentioned a particular ethnicity in their answer to this question, the demography of Wellington (Stats NZ/Tatauranga Aotearoa 2025c) was mostly reflected, though Pākehā/New Zealand European participants were slightly over-represented (72% of sample compared to 66% in census data) and Maori participants slightly under-represented (7% of sample compared to 15% in census data). Wellington's most numerous minority ethnic groups (European, Samoan, Indian, Chinese and South East Asian) were also each represented in the dataset. Eight further participants described themselves as either New Zealanders or Wellingtonians. All demographic information for the speakers can be found in Appendix B.

Figure 2.1 shows the timescale of the present study in comparison to the corpora in section 1.2.

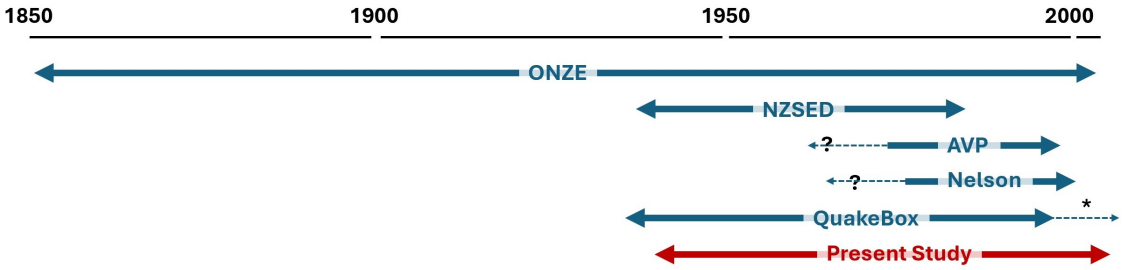


Fig. 2.1 Speaker years of birth for the present study and existing corpora

2.3 Interviews

The study was conducted with the approval of the Research Ethics Committee of the Faculty of Modern and Medieval Languages and Linguistics at the University of Cambridge. Two elicitation tasks were carried out: a picture description task and a reading task. Interviews were conducted in several locations. Around half of the participants were interviewed in quiet rooms in their own homes, but interviews were also conducted in meeting rooms in local churches, libraries, and civil service offices. These alternative locations were used at the suggestion of interviewees and were therefore familiar spaces to the participants, with the exception of two interviews conducted in Te Awe public library at the author's arrangement when no other space could be arranged. Recordings were made using a Zoom H4N microphone, in stereo mode. Care was taken to keep recording volume and microphone positioning similar across participants, although the range of locations did not make it possible to use a completely identical set-up for each interview.

2.3.1 Picture description task

The first task, aimed at eliciting semi-spontaneous speech, was a picture description task. To set a more informal tone, pictures were hand drawn by the author[1]. Participants were told that their interpretation of the pictures was not being investigated. There were ten pictures in the task, and each picture contained several objects or actions with names typically ending in rhyme /l/. Not all participants used all of the target words during the task, and other words containing rhyme /l/ that participants produced spontaneously in their picture descriptions were also counted as tokens for analysis. In total, 485 different lexical contexts were produced by participants, with the ten most frequent target words being *people, well, little, table, all, couple, middle, ball,* and *angels*. An example of a picture used in the first task is given in figure 2.2; the remainder of the prompt images are provided in Appendix A.

2.3.2 Reading task

The second task, intended to elicit read speech, required participants to read a list of around fifty sentences. Whilst it was expected that the read speech would be in a somewhat more formal register than that of the picture description task, participants were reassured that it was not a test of reading skill, that there were no correct or incorrect pronunciations, and that they should speak however felt most comfortable or natural to them. This was in particular to avoid the kind of register that was actively taught in mid-20th Century New Zealand

[1] with questionable artistic quality

Fig. 2.2 Example of a picture description item, with target words
people, puddle, table, couple

schooling, where students were encouraged to speak with a heavily RP-influenced accent, as discussed in section 1.1.3.

Three sets of sentences were included in the reading task, though spliced together so as to minimise drawing participants' attention to any patterns. The first set was the same wordlist used for data collection in the NZSED corpus (Warren 2002). This set was composed mostly of /h (d)/ wordlist items, as well as some targeting unstressed vowels (commA, Ahead), and some further items that have variable pronunciation in NZE (*foyer, tour, our*). All wordlist items were embedded in the sentence structure 'say *X* please' in order to control placement of the target word within the intonational phrase. The second set contained items aimed at investigating the unstressed vowel merger, also referred to as the *villagers/villages* merger, though this variable was not pursued further during analysis. The third set of sentences targeted rhyme /l/, embedded in full sentence contexts so as not to draw the speakers' attention to the variable under investigation. Appendix A contains the reading task given to each participant.

2.4 Data collection

675 minutes of spontaneous speech and 113 minutes of read speech were recorded, an average per speaker of 18 minutes and 3 minutes respectively. Overall recording session lengths were fairly consistent, ranging from 18 minutes to 27 minutes. All speech was annotated in *Praat* (Boersma and Weenink 2025), where a TextGrid object with six tiers was created for each speaker. The first tier was used for noting the lexical context of variables, and the next four were used for the variables under investigation: monophthongs, rhyme /l/, linking /r/ presence/absence, and post-vocalic /r/. The final tier was used to mark the transition point between the two tasks and associated speech styles.

For the monophthong analysis, all tokens were taken from the picture description task. Tokens were only annotated in contexts where there were no major consonantal coarticulation effects, meaning nasal, rhotic and lateral environments were excluded. The start and end points of each monophthong were marked, and measurements of F1-F3 frequencies were taken at the midpoint of the interval using a *Praat* script adapted from Stanley and Lipani (2019). A few speakers had significant onglides in FLEECE or GOOSE, examples of which from the dataset are shown in figure 2.3 below.

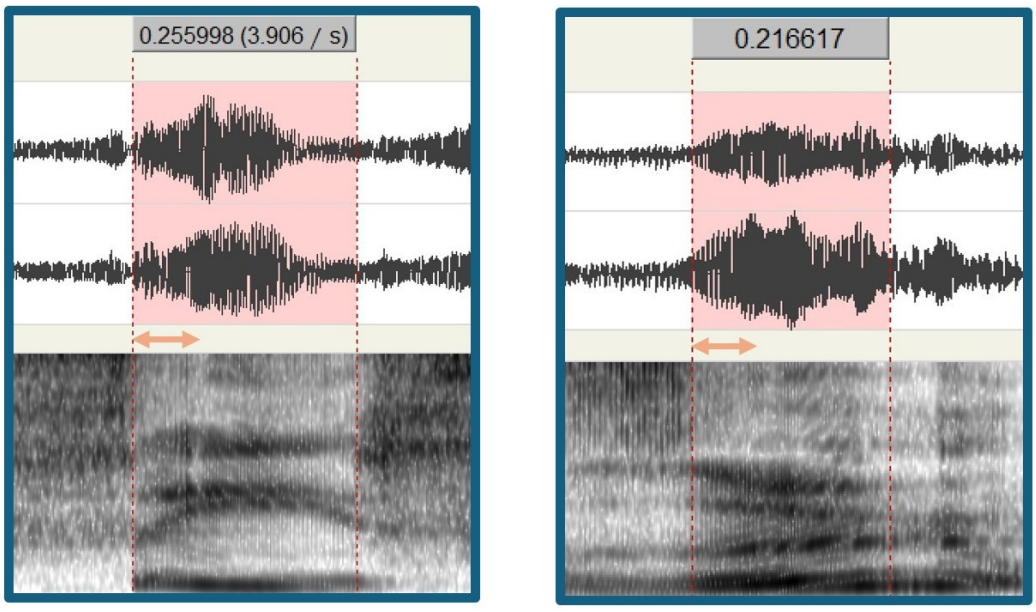


Fig. 2.3 Spectrogram examples of diphthongal FLEECE (left) and GOOSE (right), arrows denoting onglides

For these speakers, the interval marked for midpoint value extraction was delayed so that the 'midpoint' of the interval was slightly later than halfway, falling at the delayed vowel target.

Some speakers also produced THOUGHT with a significant offglide in open syllables. An example of this is given in figure 2.4 below.

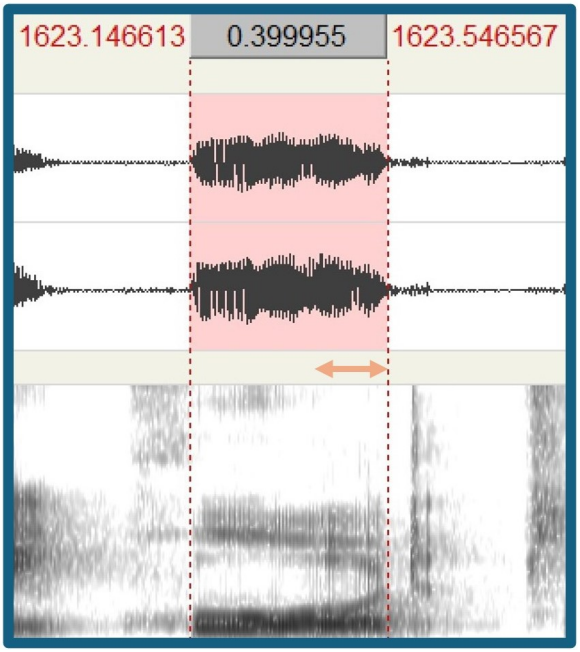


Fig. 2.4 A spectrogram example of THOUGHT, arrow denoting offglide

For these speakers, the interval marked for midpoint value extraction was brought foward so that the 'midpoint' was slightly earlier than halfway. This ensured that the vowel targets for these speakers were not misrepresented as centralised.

After all tokens had been extracted, raw F1-F2 frequencies were plotted for each speaker and visually inspected for outliers. Each outlier was then found in the *Praat* annotation and errors in formant tracking were either hand-corrected and re-measured, as was the case for roughly 100 tokens, or discarded if formant frequency values were not clearly discernible, which was the case for a very small minority of tokens. In total, 5,463 vowel tokens were included in further analyses. These tokens were not distributed equally across lexical sets: table 2.1 shows the count of tokens for each monophthong.

Table 2.1 Token counts for each of the eleven monophthongs

Lexical set	Tokens
FLEECE	395
DRESS	631
KIT	636
TRAP	617
STRUT	346
START	496
LOT	645
THOUGHT	406
FOOT	401
NURSE	455
GOOSE	435
Total	5463

Rhyme /l/ tokens were annotated with their syllable position (syllabic, coda, or cluster), and one of the three auditory categories "vocalised", "unvocalised", or "unclear". Tokens were coded as vocalised where there was no evidence of any articulatory constriction to airflow, and no formant transitions to following vowels that indicated the presence of an articulated [ɬ]. Tokens were coded as vocalised when clearly articulated [ɬ] was audible, or formant transitions to following vowels were indicative of such articulation. When none of these criteria were met, or the segment was ambiguous for other reasons, the token was coded as "unclear". Tokens were usually marked as "unclear" for one of four reasons: particularly rapid speech rate, non-modal voice quality, low speech volume (particularly phrase-finally), or nasal coarticulation that continued through the whole token.

Across the two tasks, 5660 rhyme /l/ tokens were annotated, 618 of which (10.8%) were marked as unclear. These unclear tokens were excluded from further analysis, leaving 5042 rhyme /l/ tokens in the dataset: 3861 tokens from the picture description task and 1181 tokens from the reading task. Figure 2.5 shows a vocalised /l/ as it appears on the spectrogram: note the [w]-like formant transition to the following vowel.

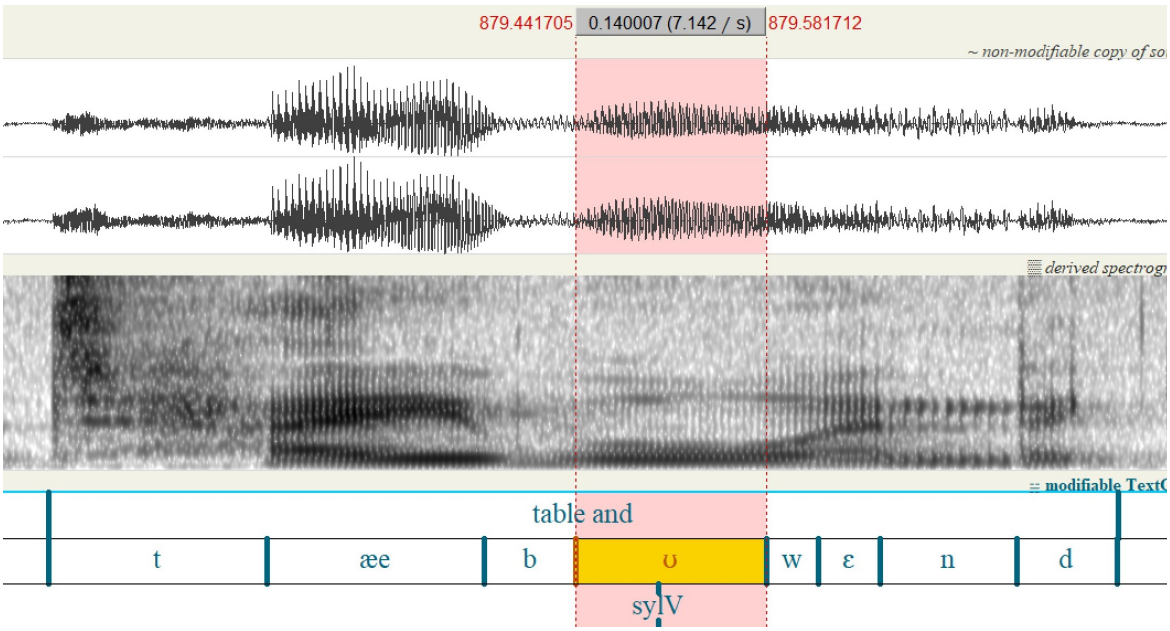


Fig. 2.5 A spectrogram example of vocalised syllabic /l/ in spontaneous speech

Linking /r/ presence and absence were recorded in a point tier. Tokens of intrusive /r/ were also annotated, but token counts were so low, at 34 tokens across 19 speakers, that it was decided that further investigation would not be possible. Tokens of post-vocalic /r/ were recorded in another point tier, along with their lexical context. The presence of /r/ was identified with respect to both auditory and spectrographic information such as formant dynamics. For the majority of speakers, absence of post-vocalic /r/ was not recorded as either they were categorically non-rhotic, or produced fewer than five tokens of post-vocalic /r/ during the interview. For speakers with more systematic use of post-vocalic /r/, a second pass of transcription was carried out and all non-rhotic tokens of the relevant lexical sets were also annotated in order to represent proportions of rhotacisation.

2.5 Vowel normalisation

Vowels were normalised across speakers using an adaptation of the Lobanov method devised by Brand et al. (2021), which they refer to as 'Lobanov 2.0'. The widely-used traditional Lobanov method, after Lobanov (1971), fits speakers' F1 and F2 frequency values across a Z-distribution by dividing the difference of each formant measurement from the sample mean and then dividing by the sample standard deviation (Equation 2.1).

$$F_{lobanov} = \frac{F_{raw} - \mu}{\sigma} \tag{2.1}$$

However, when token counts across categories are unequal, as is to be expected in spontaneous speech, this can skew the distribution towards more frequent vowels. Brand and colleagues adapt this method by first taking the mean and standard deviation of each vowel category, and then fitting measurements to a *Z*-distribution using the mean of means and standard deviation of means (Equation 2.2)

$$F_{lobanov2.0} = \frac{F_{raw} - \mu(\mu_{FLEECE}, \mu_{DRESS}, ..., \mu_n)}{\sigma(\mu_{FLEECE}, \mu_{DRESS}, ..., \mu_n)} \tag{2.2}$$

This second method was chosen for the present study because of the unequal distribution of tokens across the 11 monophthongs, as demonstrated in table 2.1 above. Figure 2.6 shows the effect of normalisation on tokens from male and female speakers.

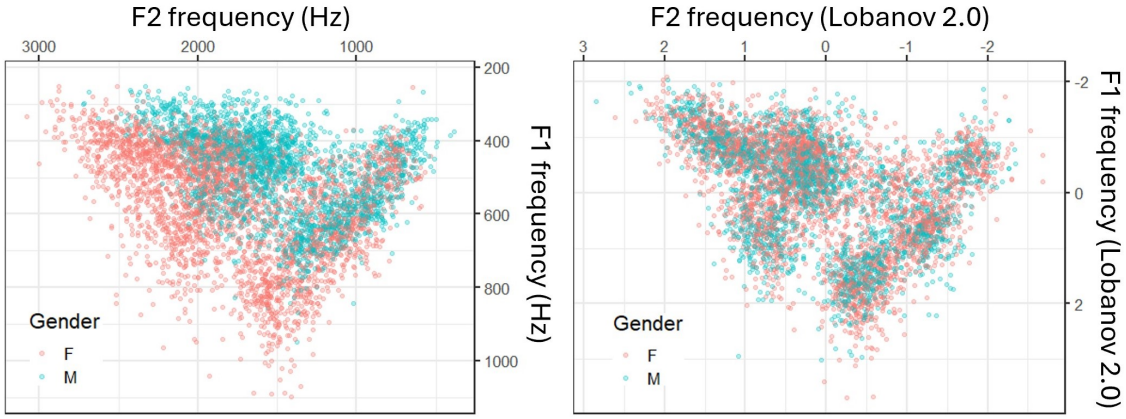


Fig. 2.6 Male and female speakers' vowel tokens before (left) and after (right) normalisation

2.6 Statistical analysis

All statistical analysis was undertaken in *RStudio* (Posit Team, 2023). For analysis of the monophthongs, linear mixed-effects models were used using the package `lme4` (Bates et al., 2015), with normalised F1 and F2 frequencies as the response variables. These models were structured as follows for each vowel:

```
model <- lmer(formant_lob2.0 ~ predictor + (1|ID))
```

Age was always modelled as a continuous variable, though the figures in chapters 3 and 4 are plotted with discrete groups for visual clarity. The decision was taken to use a random intercept for speaker ID due to the differences in token counts across speakers. Two models

were constructed for each vowel, for normalised F1 and F2 frequencies respectively. *p*-values below 0.01 were taken to be significant, due to the repetition of models. Where visual inspection suggested a significant gender difference, the model was updated to include an interaction effect of `(age*gender)`.

For r-liaison and l-vocalisation, generalised linear mixed effects models were used due to the binary response variables. Once again, a random intercept for speaker ID was included due to uneven token counts. Using the Akaike Information Criterion as an estimate of model fit (Akaike, 1974), random intercepts were added for gender and phonetic environment for analysis of l-vocalisation, and a random intercept was added for task in the analysis of r-liaison. *p*-values were considered to indicate statistical significance at 0.05 or below. The models for these variables were structured as follows:

```
model <- glmer(response ~ predictor + (1|ID) + (1|other intercepts),
 family = binomial)
```

2.7 Post-hoc testing for accommodation effects

Following the above analysis, it was decided that an investigation of speakers' vowels over the course of the interview would be necessary, to assess whether any of these reported results may in fact be accommodation to the author's SSBE vowel system. Figure 2.7 shows the group means of raw F1 and F2 frequencies for the female participants' monophthongs, together with the author's mean raw F1 and F2 frequency values for monophthongs.

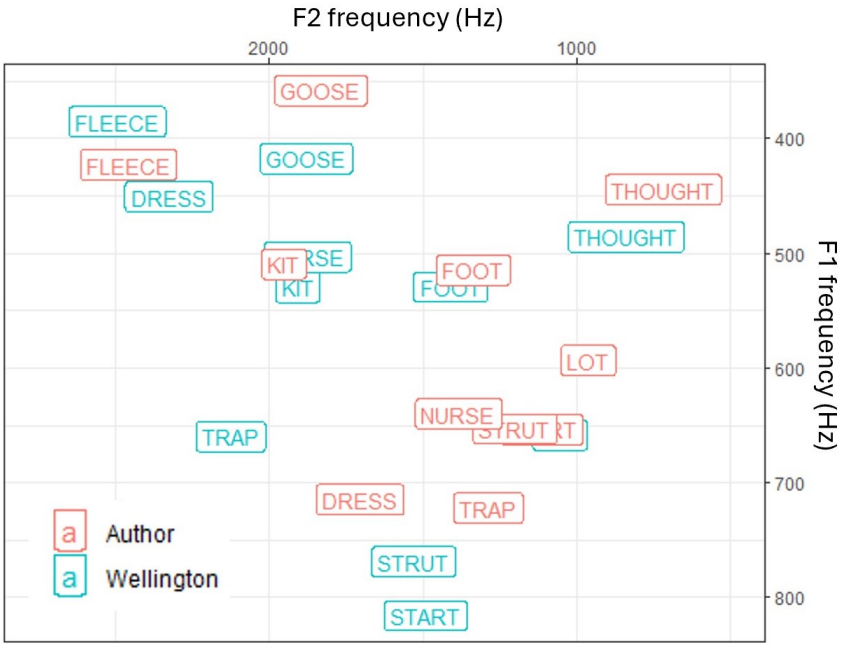


Fig. 2.7 Mean F1 and F2 frequencies for monophthongs from female Wellington speakers, compared to the author

Linear mixed effects models were constructed for each vowel following the structure described in section 2.6, with normalised time replacing age as the predictor variable. Figure 2.8 presents the movements of each monophthong over the course of the interview, with Generalised Additive Mixed-effects Models (GAMMs) generating the contours. The asterisk denotes statistical significance.

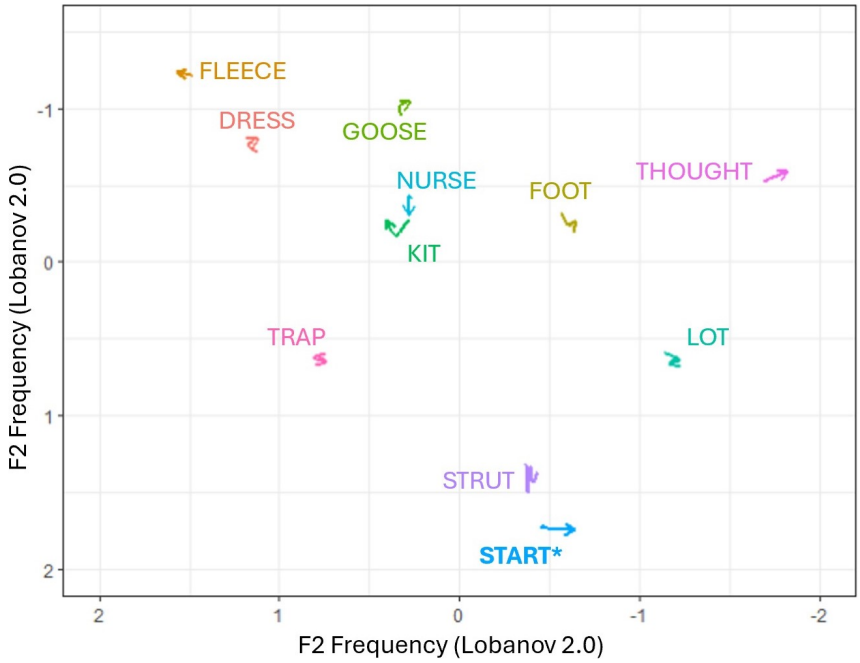


Fig. 2.8 Predicted normalised F1 and F2 frequency movements of each monophthong by normalised time throughout the interview

As evident above, movement over the course of the interview was generally minimal. The only significant movement is that of START, which significantly retracts throughout the interviews ($\beta = -0.08,\ p = 0.01$). There were two marginally significant accommodation effects further to START, being retraction of LOT ($\beta = -0.09,\ p = 0.02$), and retraction of THOUGHT ($\beta = -0.09,\ 0.037$). No other vowels showed significant change in F1 or F2 frequencies relative to normalised time.

Chapter 3

Monophthongs: Results and Discussion

3.1 Monophthong results

Figure 3.1 shows the normalised F1 and F2 frequencies of monophthong tokens for all speakers from the picture description task. Ellipses represent 95% confidence intervals.

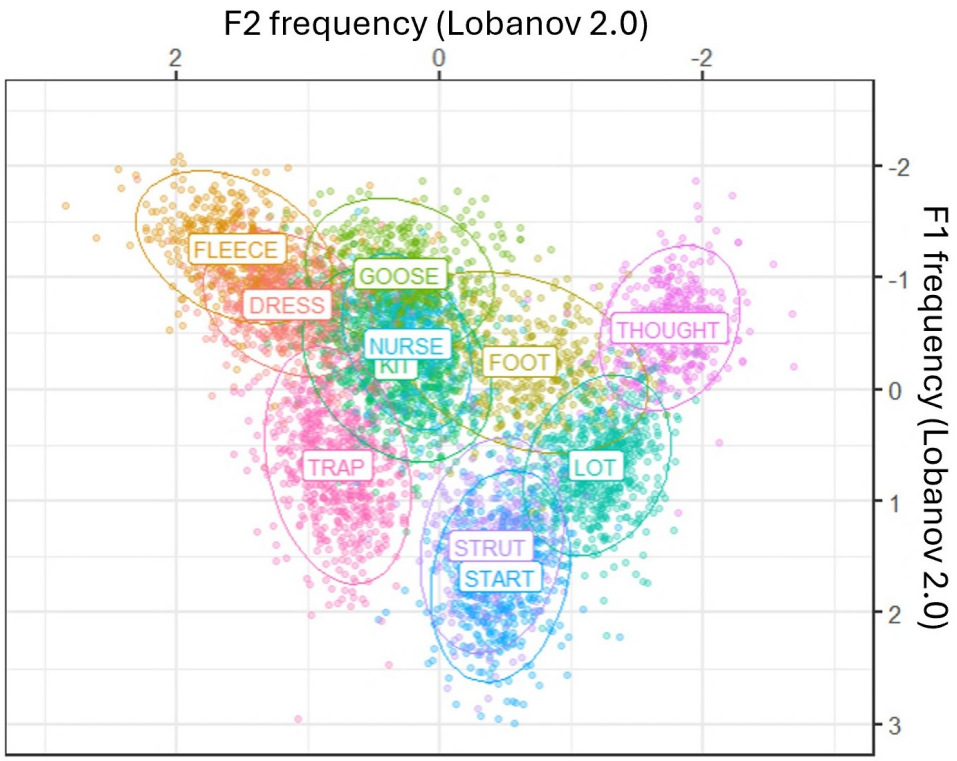


Fig. 3.1 Normalised F1 and F2 frequency for all speakers' spontaneous monophthong tokens

3.1.1 TRAP, DRESS and KIT

Figure 3.2 shows normalised F1 and F2 frequencies of spontaneous TRAP tokens, in the context of the full set of spontaneous monophthong tokens. The two ellipses represent 95% confidence intervals for speakers under 28 and speakers 50 years and older[1].

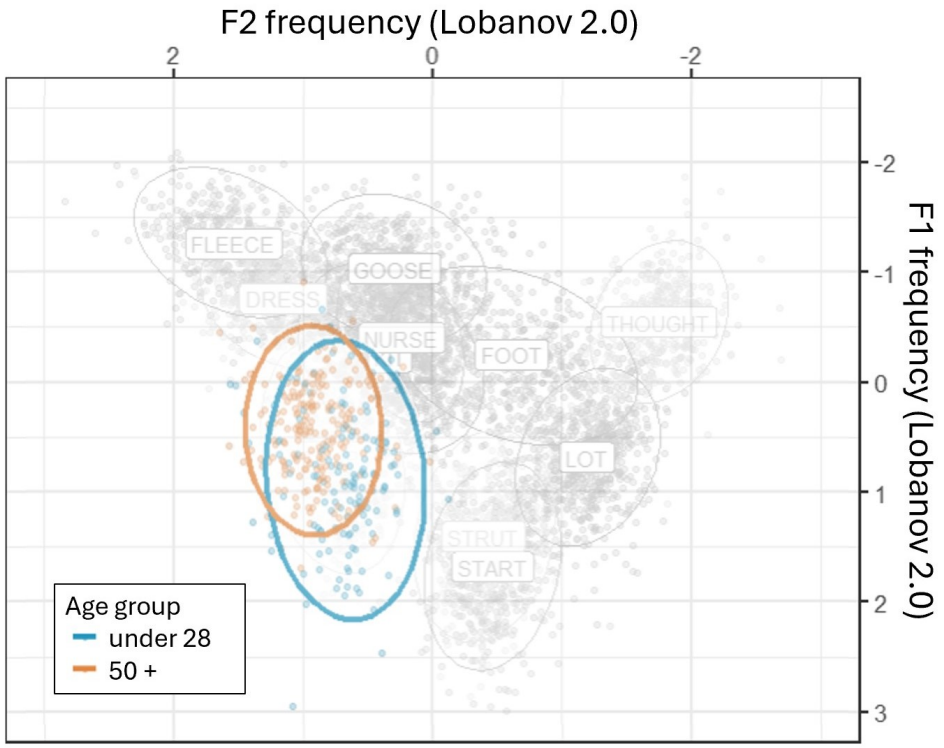


Fig. 3.2 Normalised F1 and F2 frequency of TRAP tokens by age group

TRAP is significantly lowered ($\beta = -0.012,\ p < 0.001$) and retracted ($\beta = 0.0048,\ p < 0.001$) for younger speakers.

[1] note that discrete age groups are only for visual clarity, and statistical results result from continuous modelling of age. β here represents estimated change per year of age.

Figure 3.3 shows normalised F1 and F2 frequencies of spontaneous DRESS tokens, in the context of the full set of spontaneous monophthong tokens. The two ellipses represent 95% confidence intervals for speakers under 28 and speakers 50 years and older.

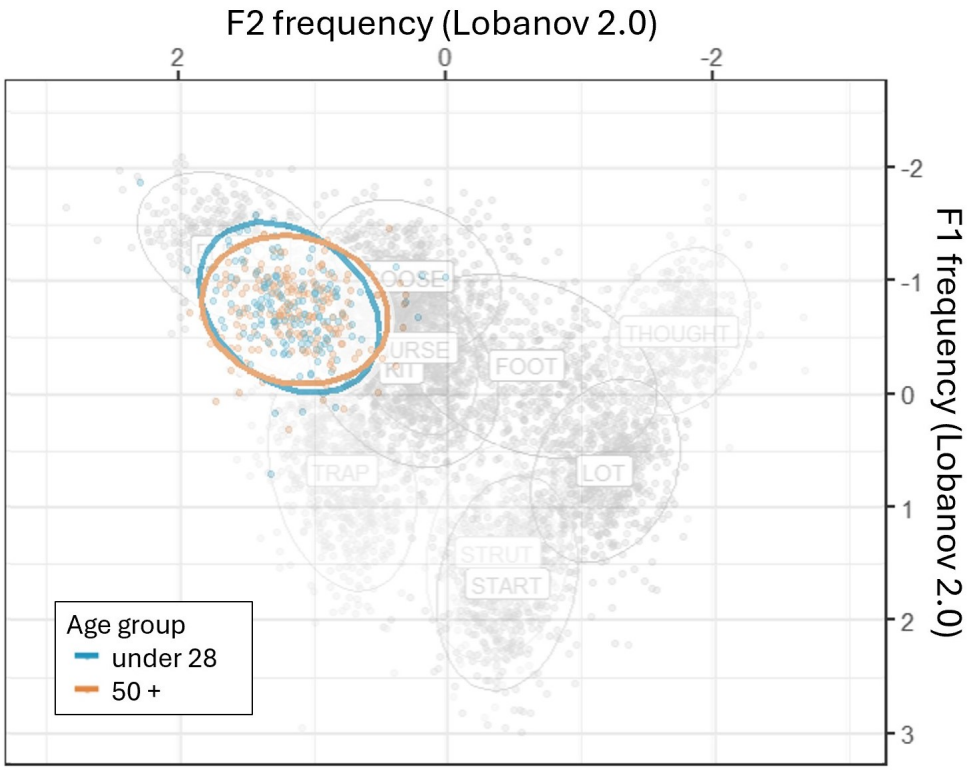


Fig. 3.3 Normalised F1 and F2 frequency of DRESS tokens by age group

DRESS does not show any such change by age, confirmed by null statistical results for both F2 ($\beta = -0.0011,\ p = 0.3$) and F1 ($\beta = 0.0024,\ p = 0.075$) frequencies.

Figure 3.4 shows normalised F1 and F2 frequencies of spontaneous KIT tokens, in the context of the full set of spontaneous monophthong tokens. The two ellipses represent 95% confidence intervals for speakers under 28 and speakers 50 years and older.

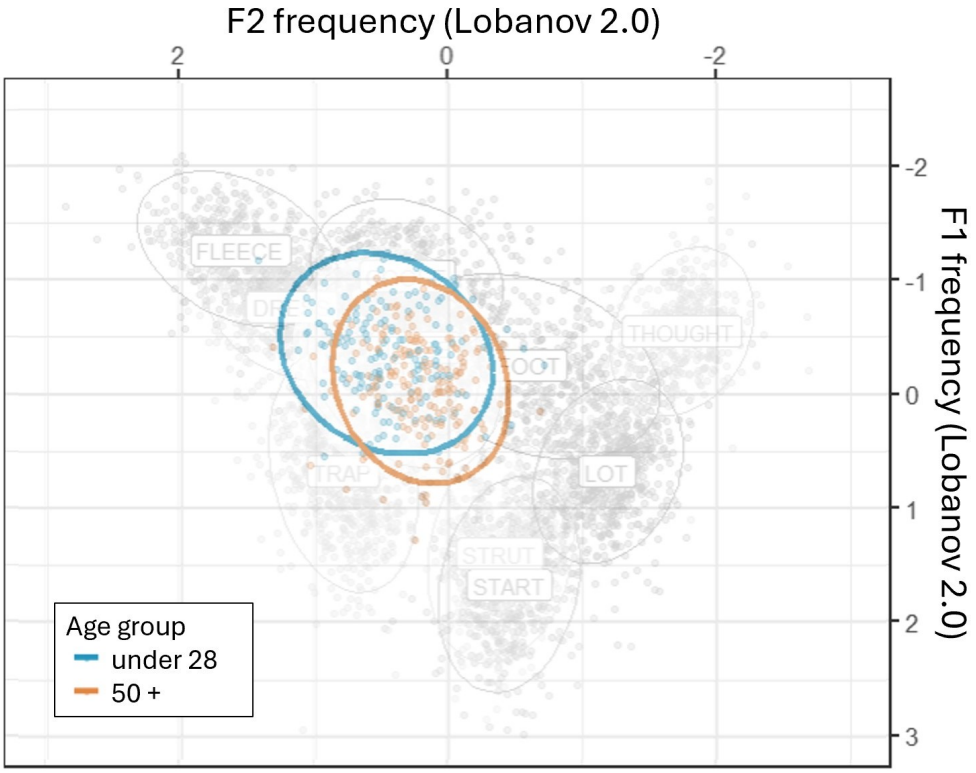


Fig. 3.4 Normalised F1 and F2 frequency of KIT tokens by age group

KIT is both raising ($\beta = 0.0069,\ p < 0.001$) and fronting ($\beta = -0.0062,\ p < 0.001$) in younger speakers. For KIT-raising, there was a marginally significant interaction of age and gender, with male speakers demonstrating less raising ($\beta = -0.0073,\ p = 0.046$). For KIT-fronting, men had marginally significant fronting compared to their female counterparts ($\beta = -0.308,\ p = 0.012$), and the interaction of gender and age was significant ($\beta = 0.0075,\ p = 0.006$).

3.1.2 START and STRUT

Figure 3.5 shows normalised F1 and F2 frequencies of spontaneous START tokens, in the context of the full set of spontaneous monophthong tokens. The two ellipses represent 95% confidence intervals for speakers under 28 and speakers 50 years and older. It is also noted in section 2.7 that START was subject to movement over the course of the interviews, retracting with respect to normalised time, suggesting a potential accommodation effect.

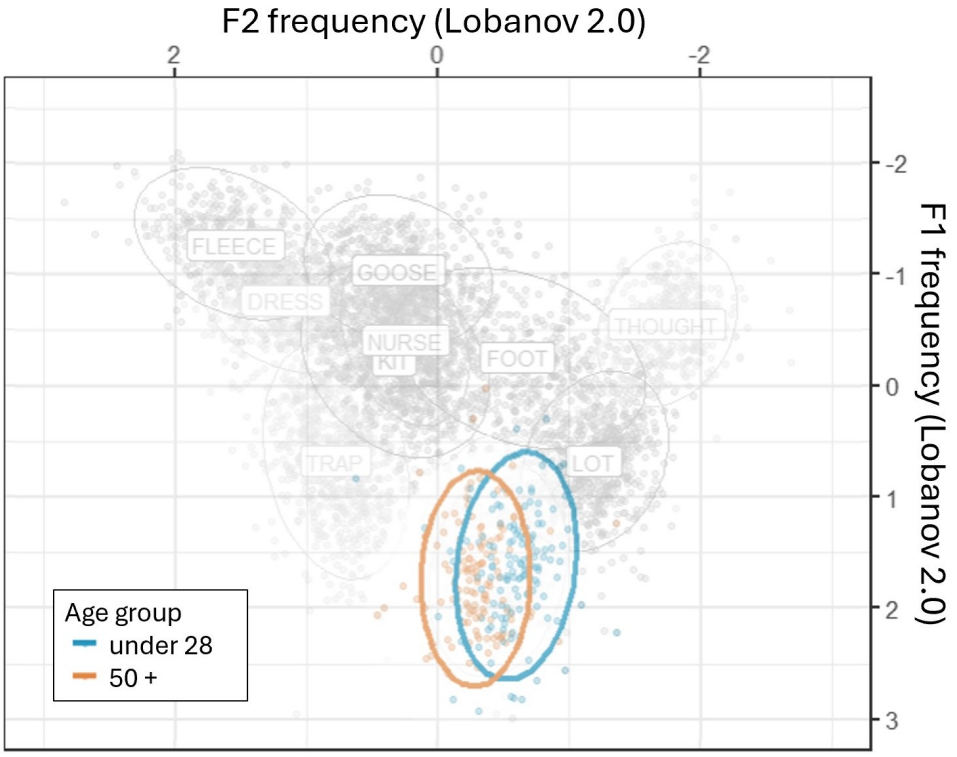


Fig. 3.5 Normalised F1 and F2 frequency of START tokens by age group

START is significantly more retracted in younger speakers ($\beta = 0.0062,\ p < 0.001$). Closer inspection showed this to only be true for female speakers ($\beta = 0.007,\ p < 0.001$), with male speakers showing no such effect ($\beta = -0.001,\ p = 0.4$).

Figure 3.6 shows normalised F1 and F2 frequencies of spontaneous STRUT tokens, in the context of the full set of spontaneous monophthong tokens. The two ellipses represent 95% confidence intervals for speakers under 28 and speakers 50 years and older.

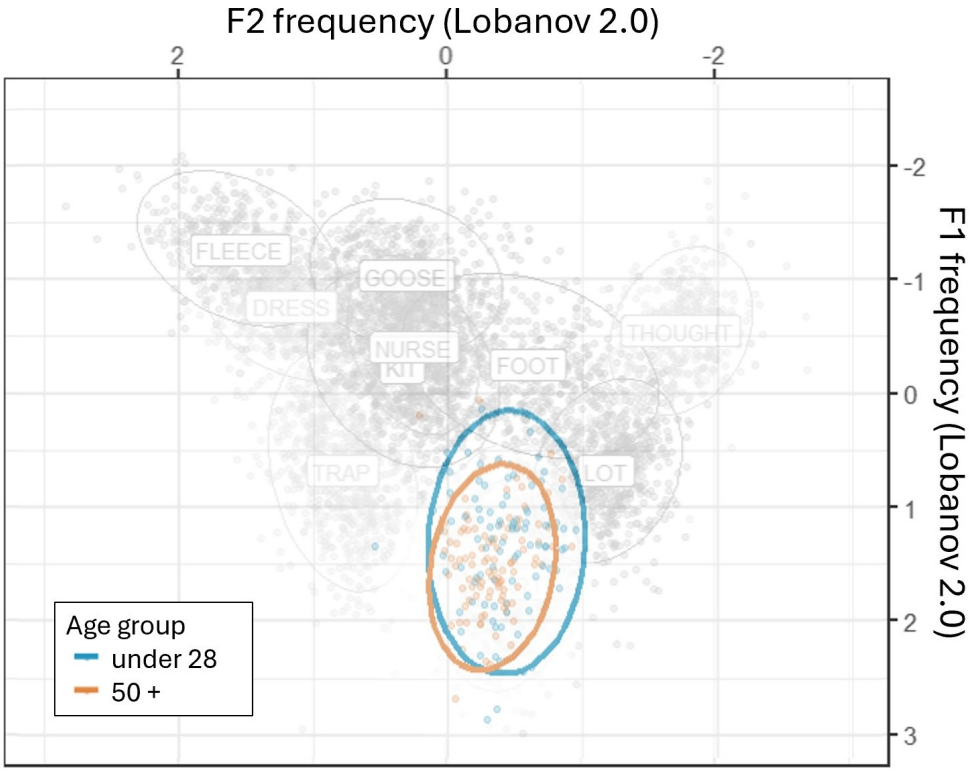


Fig. 3.6 Normalised F1 and F2 frequency of STRUT tokens by age group

STRUT is raised for younger speakers at a marginal significance level ($\beta = 0.0031$, $p = 0.029$). Though visually younger speakers' STRUT vowels appear slightly retracted, this is not statistically significant ($\beta = 0.0019$, $p = 0.093$).

3.1.3 NURSE

Figure 3.7 shows normalised F1 and F2 frequencies of spontaneous NURSE tokens, in the context of the full set of spontaneous monophthong tokens. The two ellipses represent 95% confidence intervals for speakers under 28 and speakers 50 years and older.

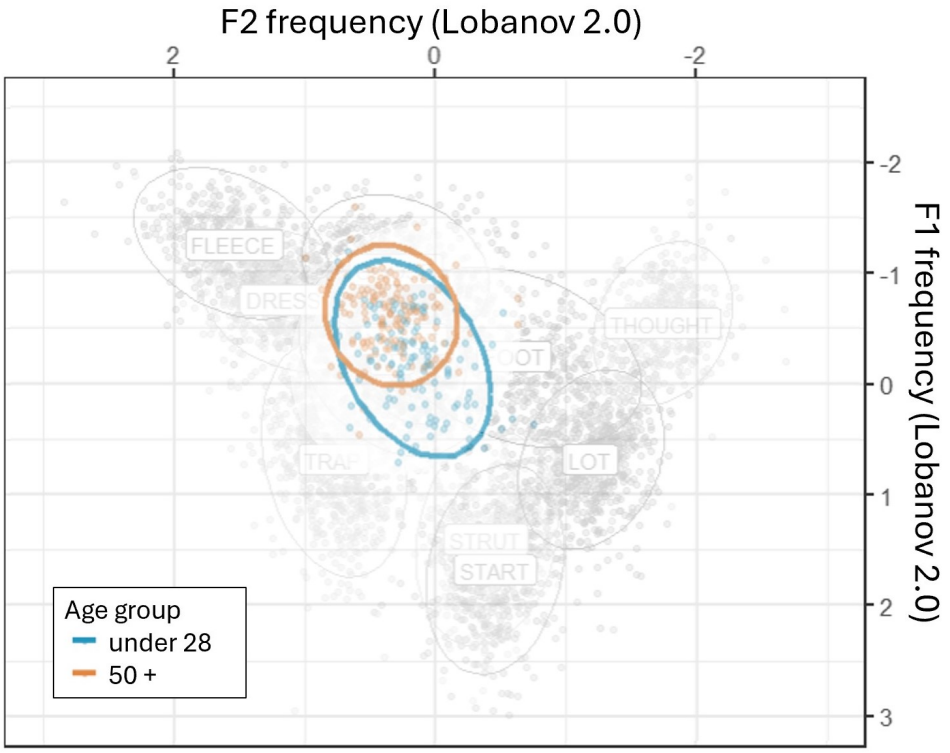


Fig. 3.7 Normalised F1 and F2 frequency of NURSE tokens by age group

NURSE is significantly lowered for younger speakers ($\hat{\beta} = 0.0093,\ p < 0.001$). However, this was found to be subject to gender variation. Figure 3.8 shows normalised F1 and F2 for all tokens of NURSE for speakers in the <28 group, with ellipses representing 95% confidence intervals for young men, young women and all speakers over 50 years old.

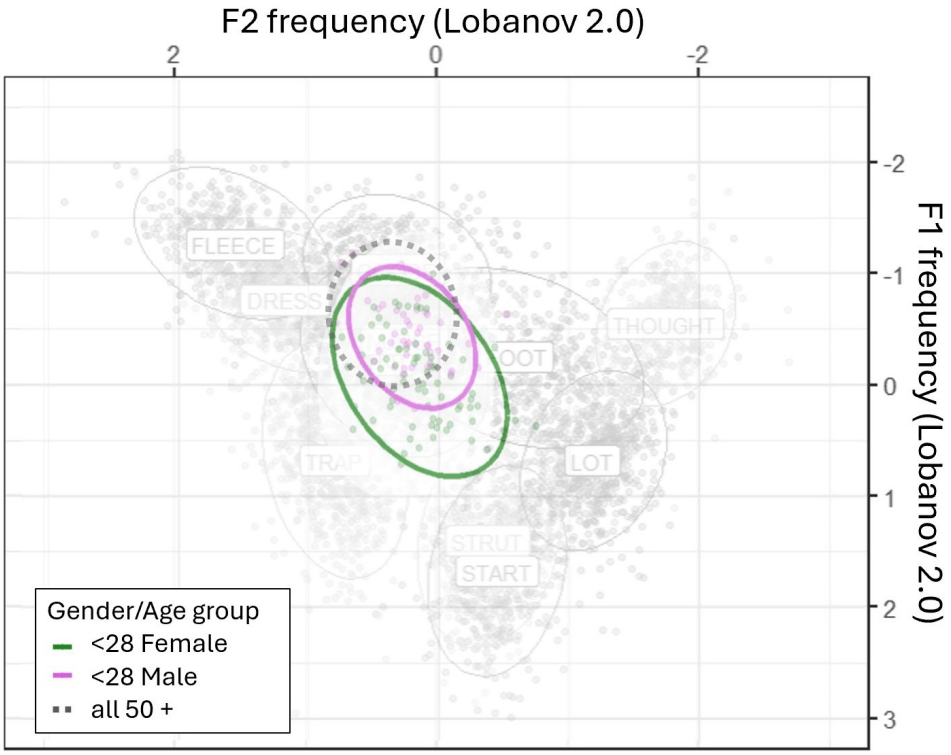


Fig. 3.8 Normalised F1 and F2 frequency of NURSE tokens from speakers under 28, by gender

Post-hoc tests confirmed that there is only significant lowering of NURSE among younger female speakers ($\beta = 0.012,\ p < 0.001$), and no significant lowering in younger male speakers ($\beta = 0.0037,\ p = 0.12$).

3.1.4 FOOT and LOT

Figure 3.9 shows normalised F1 and F2 frequencies of spontaneous FOOT tokens, in the context of the full set of spontaneous monophthong tokens. The two ellipses represent 95% confidence intervals for speakers under 28 and speakers 50 years and older.

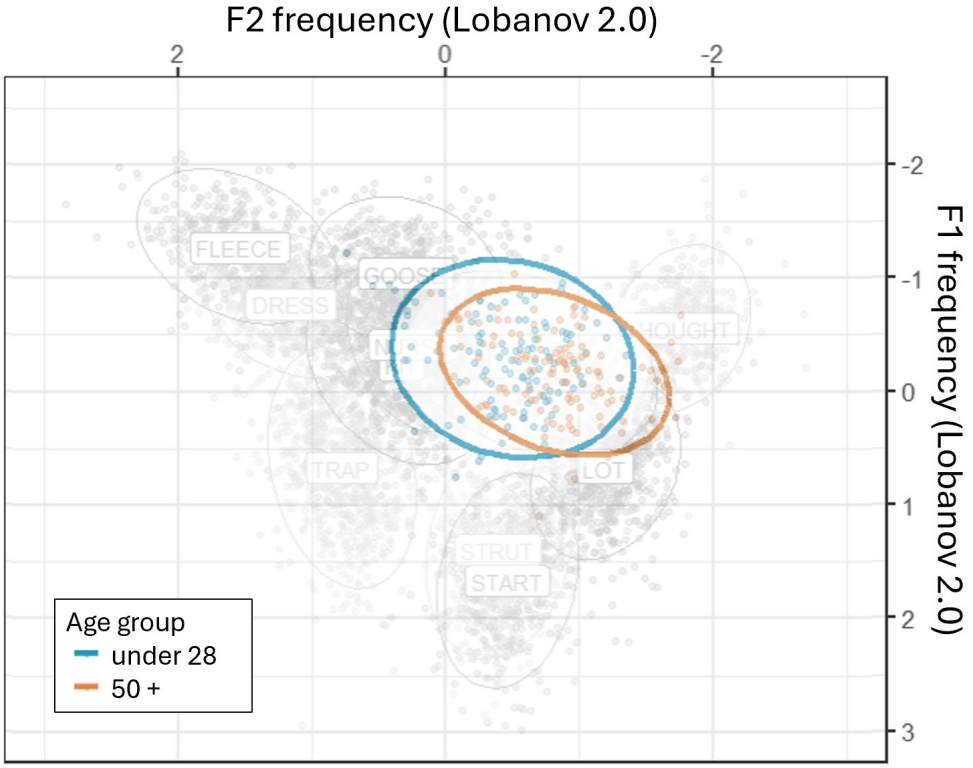


Fig. 3.9 Normalised F1 and F2 of FOOT tokens by age group

FOOT is significantly fronted by younger speakers ($\beta = 0.0072,\ p < 0.001$).

Figure 3.10 shows normalised F1 and F2 frequencies of spontaneous LOT tokens, in the context of the full set of spontaneous monophthong tokens. The two ellipses represent 95% confidence intervals for speakers under 28 and speakers 50 years and older.

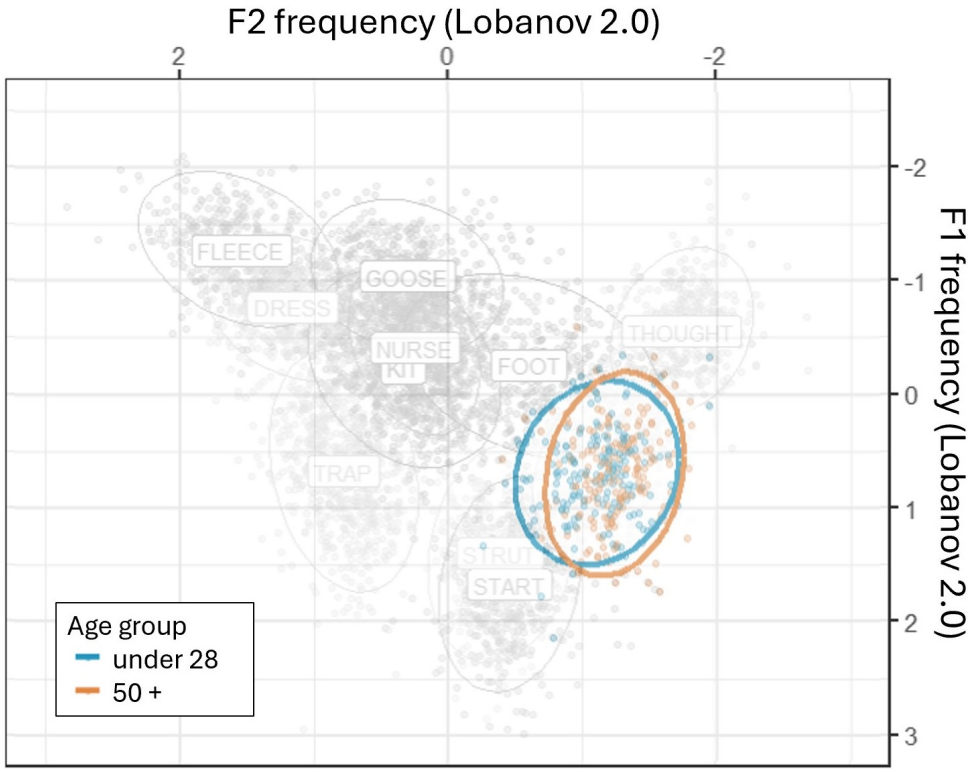


Fig. 3.10 Normalised F1 and F2 of LOT tokens by age group

LOT is marginally fronted in younger speakers ($\beta = 0.0024$, $p = 0.03$). There is no significant age variation in vowel height ($\beta = 0.0015$, $p = 0.3$).

3.1.5 FLEECE, GOOSE and THOUGHT

Figure 3.11 shows normalised F1 and F2 frequencies of spontaneous FLEECE tokens, in the context of the full set of spontaneous monophthong tokens. The two ellipses represent 95% confidence intervals for speakers under 28 and speakers 50 years and older.

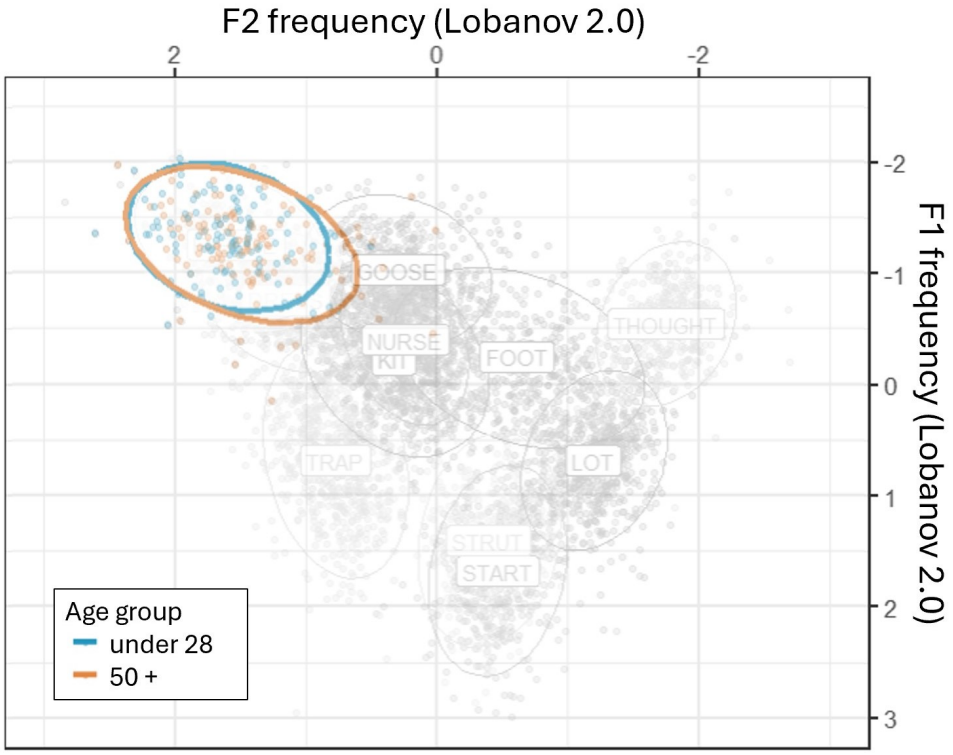


Fig. 3.11 Normalised F1 and F2 of FLEECE tokens by age group

Though FLEECE appears slightly fronted for younger speakers, this is not statistically significant ($\beta = 0.003,\ p = 0.076$), and there is no significant age variation in FLEECE height ($\beta = 0.0017,\ p = 0.2$).

Figure 3.12 shows normalised F1 and F2 frequencies of spontaneous GOOSE tokens, in the context of the full set of spontaneous monophthong tokens. The two ellipses represent 95% confidence intervals for speakers under 28 and speakers 50 years and older.

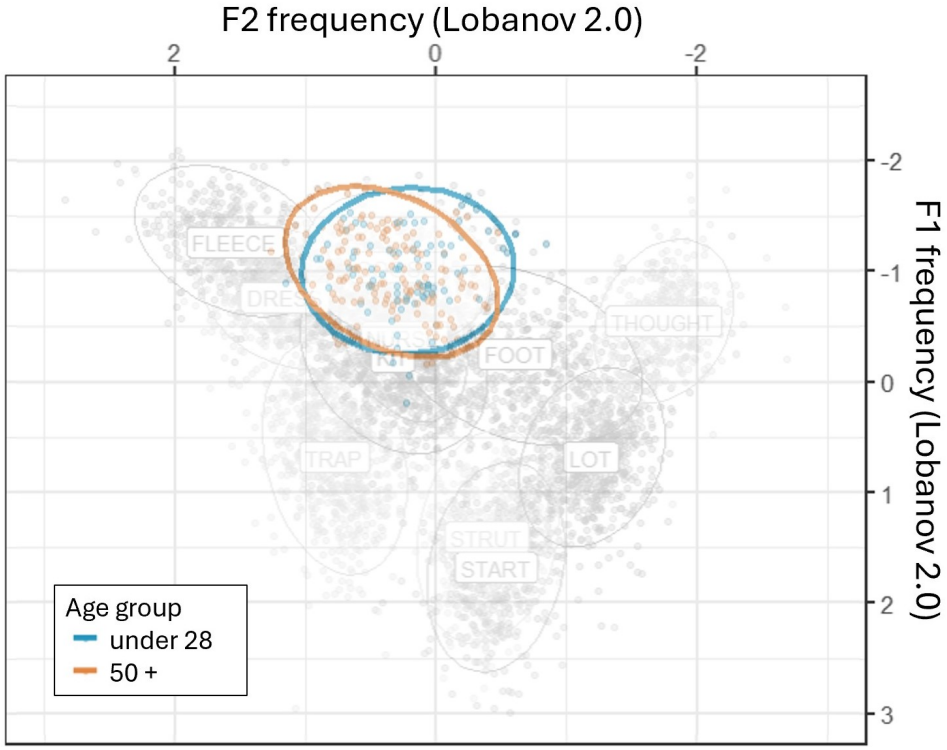


Fig. 3.12 Normalised F1 and F2 of GOOSE tokens by age group

There is no significant age variation in GOOSE, neither in vowel height ($\beta = 0.0012$, $p = 0.3$) or backness ($\beta = 0.00093,\ p = 0.5$).

Figure 3.13 shows normalised F1 and F2 frequencies of spontaneous THOUGHT tokens, in the context of the full set of spontaneous monophthong tokens. The two ellipses represent 95% confidence intervals for speakers under 28 and speakers 50 years and older.

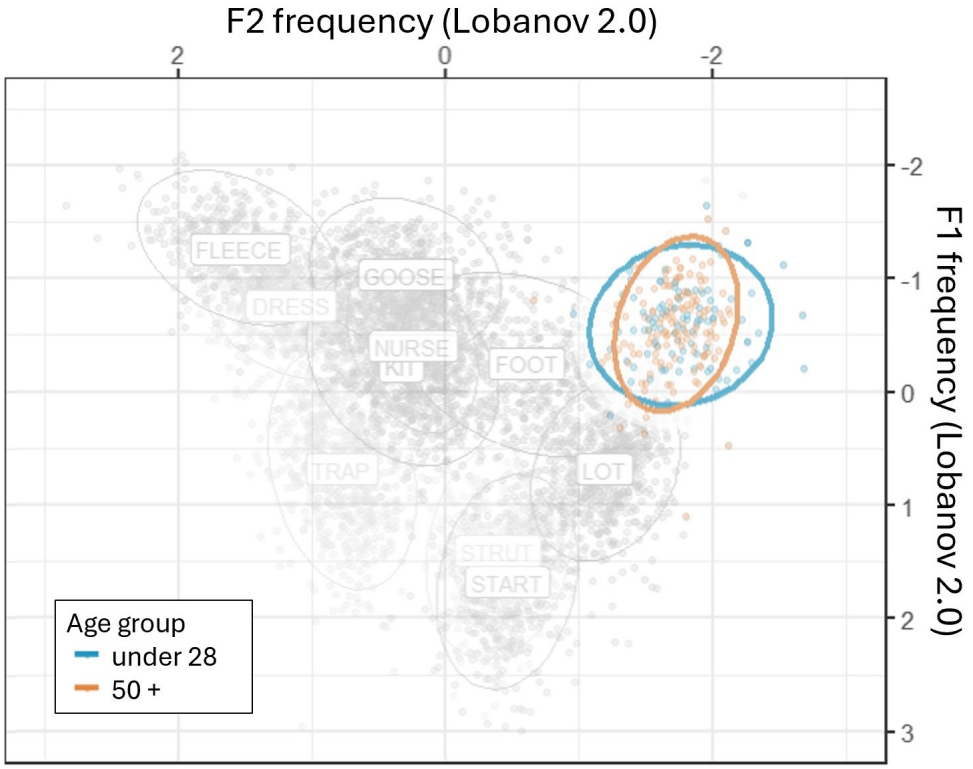


Fig. 3.13 Normalised F1 and F2 of THOUGHT tokens by age group

There is no significant age variation in THOUGHT, neither in vowel height ($\beta = 0.001$, $p = 0.5$) or backness ($\beta = 0.0015,\ p = 0.2$).

3.1.6 Summary of monophthong changes

Figure 3.14 below shows the predicted movement of monophthongs in the present study by year of birth, with contours generated by generalised additive mixed models. Arrowheads represent the direction towards younger speakers, and asterisks denote statistically significant results.

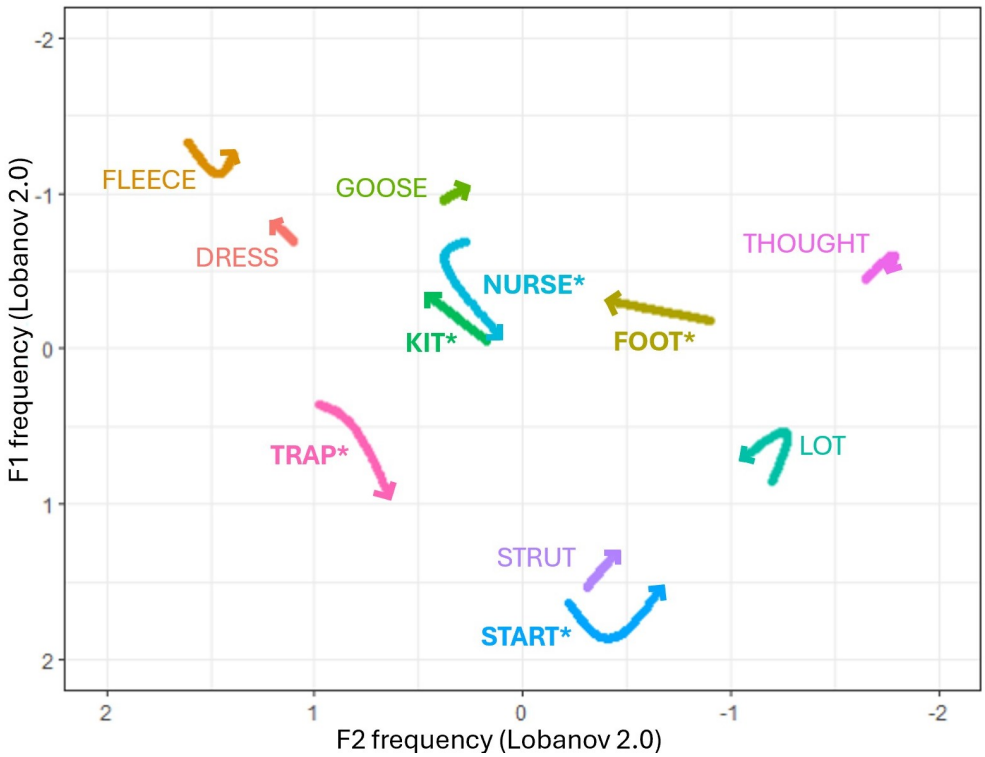


Fig. 3.14 Predicted movement in normalised F1 and F2 of the 11 monophthongs by year of birth

Table 3.1 presents a summary of the statistical analysis of the monophthong movements above. Bracketed values are of marginal significance.

Table 3.1 Summary of monophthong changes

Lexical set	Height	Backness
TRAP	lowered, $p < 0.001$	retracted, $p < 0.001$
DRESS	n.s.	n.s.
KIT	raised, $p < 0.001$	fronted, $p < 0.001$
START	n.s.	retracted*†, $p < 0.001$
STRUT	*(raised,* $p = 0.029$*)*	n.s.
NURSE	lowered*, $p < 0.001$	n.s.
FOOT	n.s.	fronted, $p < 0.001$
LOT	n.s.	*(fronted,* $p = 0.03$*)*
FLEECE	n.s.	n.s.
GOOSE	n.s.	n.s.
THOUGHT	n.s.	n.s.

*Female speakers only
† significant accommodation effect

3.2 Discussion

3.2.1 Summary of recent monophthong findings across New Zealand

Table 3.2 presents a summary of the recent monophthong changes discussed in chapter 1, combining the findings of Ross (2024), Hurring and Clark (2025), and Hurring et al. (2025) with the findings from table 3.1. Arrows represent the reported change of direction within the vowel space. Bracketed values represent marginally significant findings, and question marks represent tentative conclusions.

Table 3.2 Summary of recent monophthong changes in four New Zealand cities

Lexical set	Auckland	Nelson	Christchurch	Wellington (present study)
TRAP	↓ →	n.s.	↓ (?)	↓ →
DRESS	↓ →	n.s.	↑	n.s.
KIT	n.s.	↑ ←	↑ ←	(↑) ←
START	n.s.	n.s.	↓* →	→* (?)
STRUT	(↑) ←	←	→ †	(↑)
NURSE	↓ →	↓ →	↓ →	↓*
FOOT	(↓) ←	no data	no data	←
LOT	n.s.	←	n.s.	(←)
FLEECE	n.s.	n.s.	↑	n.s.
GOOSE	n.s.	n.s.	↓	n.s.
THOUGHT	n.s.	n.s.	↑*	n.s.

*Female speakers only
† Male speakers only

3.2.2 TRAP, DRESS and KIT

TRAP is significantly lowered and retracted for younger Wellington speakers (figure 3.2). This matches the change identified in Auckland (Ross 2018, 2024; Watson et al. 2018; Ross et al. 2021, 2023). The finding of TRAP-lowering in Wellington further supports the tentative conclusion by Ross (2024) that TRAP-lowering may be happening outside Auckland: whilst Ross did not find a significant age effect for TRAP height in her Nelson dataset, this negative result was marginal ($p = 0.02$), and the dataset was small, at 528 tokens, compared to 2389 tokens from Ross's Auckland speakers. Additionally, Ross found no significant difference in TRAP height when comparing young speakers between Nelson and Auckland. The demonstration of TRAP-lowering occurring outside Auckland therefore also supports Ross's conclusion that TRAP may be beginning to lower in Nelson, but to a lesser extent

than Auckland. Whilst no clear comparison to Auckland speakers is possible in the present study, the statistically significant result suggests that TRAP-lowering in Wellington may be more advanced than in Nelson. Therefore, TRAP-lowering in NZE is unlikely to be an Auckland-specific innovation, and is quite possibly occurring in all three regions. With TRAP-lowering taking place, NZE is beginning to change in a similar direction to SSBE, AusE and SAE, all of which have undergone TRAP-lowering in the last few generations (see section 1.4.1).

DRESS does not appear to be lowering or retracting in Wellington (figure 3.3). This contrasts with the DRESS-lowering clearly shown by Ross in younger Auckland speakers. As discussed in section 1.4.1, Ross (2024) did not find any age effect for DRESS height in Nelson, much like in the Wellington data in the present study. There are two possible interpretations for the lack of DRESS-lowering by younger speakers in Wellington and Nelson, with implications for both the relationships between NZE's short front vowels and the potential development of regional accent variation in New Zealand.

In one interpretation, the patterning together of Wellington and Nelson in their lack of DRESS-lowering could be interpreted as evidence for Auckland-specific DRESS-lowering. Wellington and Nelson are proposed by Bauer and Bauer (2002) to be part of the same linguistic supercommunity, the 'central' region, on the basis of lexical variation among school-age children, whereas Auckland is placed in the 'northern' region. Whilst variation in the names of childrens' playground games cannot be directly extrapolated to phonetic variation and influence, it could be argued that un-lowered DRESS in both cities may reflect this geolinguistic boundary. However, Ross does not go so far as to conclude that there is no DRESS-lowering at all occurring in Nelson speakers, instead suggesting that, much like TRAP-lowering, young speakers in Nelson may represent an intermediate level of DRESS-lowering, between their older Nelson counterparts and young Aucklanders. Indeed, the difference in DRESS height between young Auckland speakers and young Nelson speakers was not statistically significant. However, it is worth noting that this non-significance was marginal ($LLR = 7.5, p = 0.02$, where $\alpha = 0.01$). This is very different to Ross's findings for TRAP between young Auckland and Nelson speakers ($LLR = 4.1, p = 0.13$), and so her findings for the two vowels are not completely analogous, especially considering the differences in the Wellington findings for DRESS and TRAP.

Given the marginally significant difference between young Nelson and Auckland speakers, and the lack of DRESS-lowering by Wellington speakers in this study, it is reasonable to

question whether the lack of statistically significant regional difference between Auckland and Nelson is partly due to the low number of young Nelson speakers ($n = 8$, compared to $n = 38$ for young Auckland speakers). If this is the case, then the lack of DRESS-lowering in the present study could support the idea that DRESS is currently only lowering in Auckland, and not in Wellington or Nelson. Ideally to test this hypothesis, the DRESS vowels of young Wellington speakers would be directly compared to those of young Auckland speakers, but this is beyond the scope of the present study. Even if DRESS-lowering were happening in Wellington and Nelson to a degree that is currently intangible in small datasets, Auckland would still represent a more advanced stage of DRESS-lowering.

Nevertheless, the question remains as to whether DRESS-lowering in Wellington and Nelson simply has not happened yet. If this is the case, then DRESS-lowering is not a true regional feature of an emerging Auckland English, but rather a change that follows naturally from TRAP-lowering. From a sociolinguistic perspective, Auckland makes sense as a locus for developments in contemporary NZE: it is the country's largest and most diverse city, at one third of the national population, and also has a younger median age (35.9 years) than either Nelson (44.0 years) or Wellington (37.9 years) (Stats NZ/Tatauranga Aotearoa 2025a, 2025b, 2025c). It is possible, though by no means proven, that the monophthong changes present in all three cities (see table 3.2) have diffused southwards from linguistically innovative Auckland to Wellington and Nelson, and that DRESS-lowering will follow in due course. Whilst the data presented in chapter 3 do not provide an answer regarding the future of DRESS height outside Auckland, if the changes to TRAP are considered to be part of a broader process of 'vowel shift reversal', then DRESS is predicted to change as well.

If TRAP- and DRESS-lowering are linked in such a way, this raises the question of the two vowel changes' relative order. Ross (2024) does not suggest a relative order for the two changes, as both are solidly present in her Auckland data and neither are clearly present in her Nelson data (though TRAP is potentially lowered in Nelson, as discussed above). The earlier data from Starks and colleagues (section 1.4.1) do not offer a clear answer to the relative ordering of the two changes, as both are already present in the dataset used by Starks (2005, 2008). Whilst in Starks's dataset the rates of DRESS-lowering are higher than TRAP-lowering, this is complicated by an extra variant of TRAP in the data which is described as "typical of the BATH/STRUT/START series". The higher prevalence of DRESS-lowering in the early Auckland data therefore cannot be interpreted straightforwardly as DRESS leading the change and TRAP following. However, the findings from the present study are a valuable addition, as the presence of TRAP-lowering and not DRESS-lowering in Wellington is particularly

significant if it represents an intermediate stage of short front vowel lowering. This would suggest that TRAP-lowering may have preceded DRESS-lowering in Auckland, if the lowering is a sequence of connected vowel changes that is diffusing southwards through NZE.

There is cross-dialectal precedence for short front vowel lowering being lead by TRAP: DRESS lowered following the lowering of TRAP in SSBE (Hawkins and Midgley 2005), AusE (Cox and Palethorpe 2008; Cox et al. 2024), and SAE (Chevalier 2016). As NZE is still typically considered to contain negligible regional variation in vowel quality, any conclusions about geographical variation are likely to be tentative, and it is not unreasonable to suggest that Wellington and Nelson may in due course undergo lowering of DRESS, if this was the order of events in Auckland.

KIT is fronting and raising in younger Wellington speakers (figure 3.4). This movement of KIT is a rather unexpected result, for several reasons. Firstly, there is no notable change to KIT in Auckland, so any change to KIT in Wellington speakers is unaccounted for in an 'Auckland outwards' diffusion model. Secondly, although the young Nelsonian speakers in Ross's study had a fronted and raised KIT vowel compared to their older counterparts, Ross's explanation for this change in Nelson does not extend neatly to the Wellington findings. Ross interprets the age effect for KIT in Nelson as resulting from a generational shift away from stigmatised broad realisations, as the older Nelson group had substantial KIT-centralisation when compared to contemporaneous Auckland speakers. This can be seen visually in Ross's monophthong data: older female speakers in Nelson generally produced KIT lower in the vowel space than TRAP (Ross 2024:113), which is not the case in Auckland. Under this interpretation, the raising and fronting of KIT by young Nelson speakers is not a new sound change, but rather reflects a shift in Nelson towards the prestige variety, where KIT is higher in quality than TRAP. This interpretation is also supported by the lack of significant difference in Ross's data between KIT produced by young Auckland speakers and young Nelson speakers.

Though no direct comparison is made in the present study between young Wellington speakers and young Auckland or Nelson speakers, it would be premature to conclude that the raising and fronting of KIT in Wellington is, just like Nelson, an effect of change towards the prestige variety. Wellington is a comparatively affluent area in New Zealand, with higher median income and higher rates of tertiary education than either Auckland or Nelson (Stats NZ/Tatauranga Aotearoa 2025a, 2025b, 2025c). Additionally, in studies of folk perception of NZE regional accents, Wellington has a reputation for having a 'posh' or 'official' accent (Nielsen and Hay 2005), though this has not to date been demonstrable by

any phonetic measures. While socioeconomic status was not systematically investigated in the current study, almost half of the participants (16 of 37) were employed in civil service, head offices, and a further 13 participants were recruited through their social network. These 29 participants are evenly distributed across age groups. As a result, the sample group is likely to be overly representative of middle class New Zealanders with higher socioeconomic indicators such as level of education and income, and it is unlikely that older speakers would have particularly broad accent features when compared to their counterparts in Auckland. This is supported by the fact that only two speakers in the dataset, both older female participants, have a KIT centroid lower in quality than that of TRAP. It is also supported by the fact that when plotting the monophthongs of all female speakers over 50 years old, the confidence ellipse for KIT has a higher centroid than that of TRAP, unlike Ross's older female speakers from Nelson. This suggests that the KIT quality of older Wellington speakers is more similar to their Auckland counterparts than their Nelson counterparts, and therefore that raised and fronted KIT by Wellington's younger speakers is distinct from Ross's findings in Nelson and cannot be explained as a move in the direction of prestige features.

Another possible explanation for the changes to KIT is accommodation to the author. However, the author's KIT-realisation was not far from that of the sample mean (figure 2.7), and no effect of normalised time was found on either F1 or F2 frequencies (section 2.7), suggesting that speakers did not alter their KIT realisations over the course of the conversation. Therefore, it seems that younger speakers are producing KIT with a more front and raised quality in Wellington. Another explanation could be the presence of three speakers with Māori and/or Pasifika heritage in the younger female sample group, though as no gender effect was demonstrated, this would not explain the presence of the KIT movement in younger male speakers. In the context of chain shift 'reversal' beginning with TRAP-lowering, KIT is predicted to move after DRESS lowers. Ross (2024) acknowledges this as a possibility, but argues that this is unlikely, since DRESS- and TRAP-lowering are fairly advanced in young Auckland speakers with no sign of KIT-fronting or KIT-raising. However, this is not to say that a raised and fronted KIT vowel is novel in the context of NZE, since as previously discussed, fronted and raised KIT is a feature of Pasifika and Māori Englishes (see section 1.3.4).

3.2.3 START and STRUT

START is comparatively retracted in younger female speakers (figure 3.5). However, this retraction of START is not necessarily indicative of a sound change in NZE: though young female speakers produce a significantly retracted START vowel when compared to their older

counterparts, this may be from accommodation to the author's own accent, which has a START quality typical of SSBE (see figure 2.7). As older speakers are much less likely to alter their speech when in conversation with a younger adult (Kemper et al. 1995), and women are more likely to accommodate their speech compared to men, the younger women in the present study were more likely to accommodate to the author's vowel system. This interpretation of the START-retraction is further supported by the movement of START over the course of the interviews. As visible in figure 2.8, START retracts significantly with respect to timestamp, indicating that time spent talking to the author had an effect on START realisation. Therefore, the START-retraction in the present dataset may be partly due to accommodation.

STRUT is only marginally raised for younger speakers (figure 3.6), and there is no significant change in backness. Therefore, STRUT is not undergoing any significant change in the present study. This is surprising in the context of Ross's findings for both Auckland and Nelson (see table 3.2), which show fronting of STRUT above the significance level. While there is visually a change in F2 frequency in the Wellington data, this is in the opposite direction, with STRUT being retracted by younger speakers below the level of significance. Intriguingly, in the Canterbury QuakeBox data presented by Hurring and Clarke (2025), there is also no sign of STRUT-fronting (see figure 1.2), and Hurring et al. (2025) find retraction of STRUT in the wider QuakeBox corpus. This leaves a split in findings that makes little geographical sense: Auckland and Nelson behaving similarly, with identical significant fronting of STRUT, and Wellington and Canterbury behaving similarly, with little to no movement of STRUT. As Nelson is situated between Wellington and Christchurch, and is almost 900 kilometres from Auckland (see figure 1.1), this raises the question as to why Nelson behaves linguistically closer to Auckland than Wellington and Christchurch. This issue will be explored further below, as it is not only STRUT that appears to divide along such lines.

As well the lack of fronting, STRUT can be seen to raise slightly at a marginal level of significance. This is unlikely to be a sound change in progress: STRUT, as a short vowel, is typically subject to a degree of centralisation in conversational style, as a result of 'undershoot' (Warren 2018:319). The increased degree of centralisation by younger speakers is therefore more likely to be contextual, as their speech styles were generally less formal than their older counterparts. This is especially likely to be the case in the interviews conducted in government offices, as the younger participants were typically interns or junior employees, and older participants were typically occupying more senior positions in the organisation's hierarchy. This is likely to have affected the level of formality in the interview setting, and therefore the degree of STRUT-centralisation. This increased centralisation by younger

speakers is also visually present in the Auckland datasets, though not to the level of statistical significance, and there is no sign of STRUT-raising in Nelson. There is little to no raising of STRUT across generations in the QuakeBox corpus (Hurring and Clark 2025; Hurring et al. 2025). This may in part be due to the recording style of the corpus, which is monologue and done facing a camera in relatively formal style, as opposed to the sociolinguistic interview style of the AVP and Nelson datasets. Alternatively, it may result from factors such as interviewer age or status that are beyond the scope of the present study. In summary, the marginal raising of STRUT in the Wellington dataset is unlikely to represent an incipient sound change, and is more likely to either be stylistic or chance variation.

3.2.3.1 Reconciling START and STRUT findings: questions of methodology

As discussed above, there was a significant accommodation effect present for START in the speakers with retracted START vowels. However, START-retraction in Wellington cannot be fully ruled out. The clear lack of STRUT-fronting in the present study, together with the lack of STRUT-fronting in Canterbury, as discussed above, is mirrored exactly by the findings for START in the four cities: the plotted means in Hurring and Clark (2025), as well as the statistical analysis of the wider QuakeBox corpus in Hurring et al. (2025), both show retraction of START, but there is no START-retraction reported in either Auckland or Nelson, leading to the following distribution pattern, shown in figure 3.15 below. This is a very unlikely geographical distribution, and the fact that START findings perfectly oppose findings for STRUT is suspicious, since the two tend to act as a pair (see section 1.4.2).

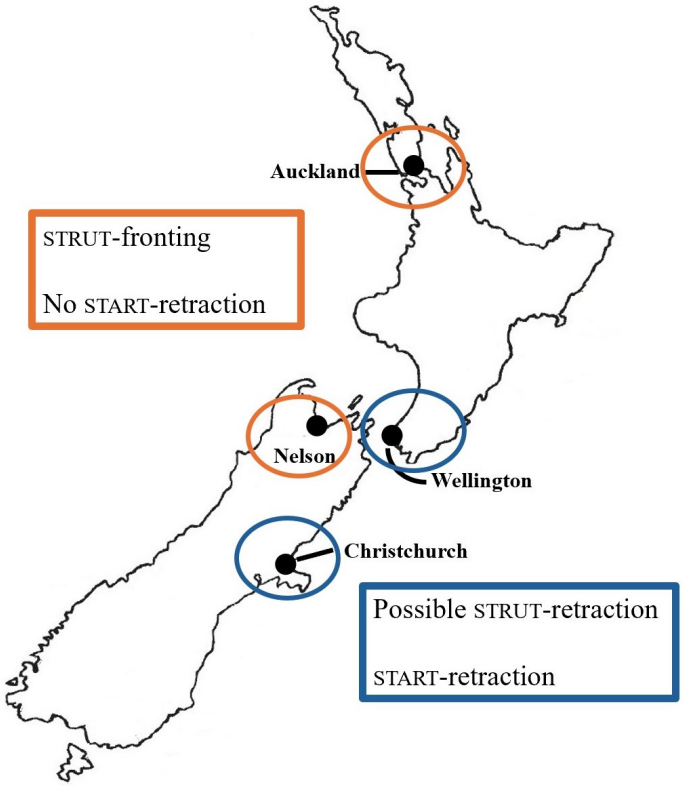


Fig. 3.15 START and STRUT findings by location

Instead, the solution is more likely to come from differences in vowel normalisation method – the present study uses the the Lobanov 2.0 method developed by Brand and colleagues at the University of Canterbury (see section 2.5), whereas the Auckland Voices Project, including Ross, use a normalisation method developed in Watson et al. (2018), where a linear transformation is used on the formant frequency values of one sex, to 'shift' them towards the other. The centroids of monophthongs at the corners of the NZE vowel space (FLEECE, START, THOUGHT) are taken as 'calibration' points, and the other vowels are rotated and stretched with respect to these three corners. Ross then repeats this transformation again, transforming the younger speakers' vowels towards those of the older speakers (2024:84). Figure 3.16 shows the visual effect of the transformation.

The crucial difference between the two procedures is that the Auckland method assumes the three corner values to be the same across both age and gender groups, whereas the Lobanov 2.0 method does not. If, when using the Auckland method, one of these corner vowels were to change between age or gender groups, this would instead give the appearance of a change to neighbouring vowels, as the moving corner is fixed in space. Brand et al.

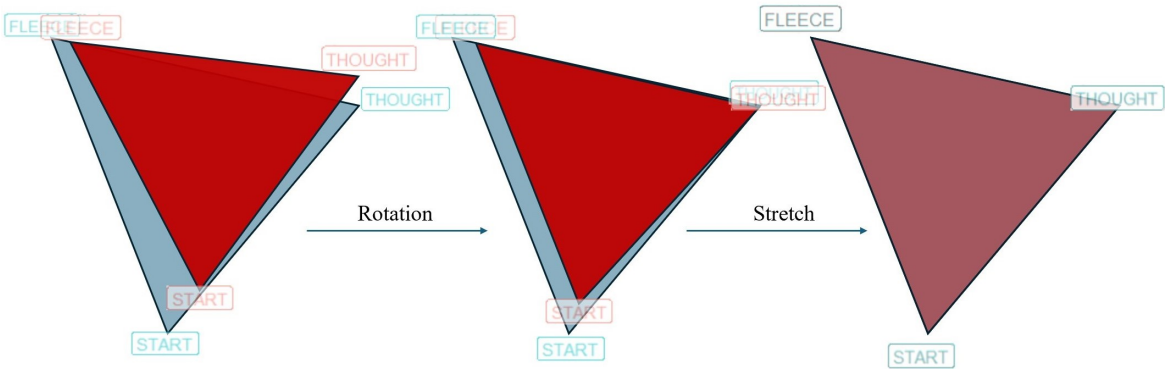


Fig. 3.16 The Auckland normalisation method. Corners represent FLEECE, THOUGHT and START.

(2021), plotting monophthong movements across speakers in the ONZE corpora (section 1.2.1), show that the three peripheral vowels are far from static over time; FLEECE and THOUGHT both appear to have become slightly more central, and START has fronted and then retracted. Their modelling attributes the most fronted START vowels to speakers born around 1925, and shows START-retraction steadily progressing in subsequent generations up until speakers born in 1982, where the dataset ends. If START is retracting over time, this would have significant implications for normalisation methods taking the vowel to be a fixed point. Indeed, when the two age groups' pre-transform values are presented by Ross (2024:84), START can be seen to be comparatively retracted by young speakers, and there is no sign of STRUT-fronting until after the transformation is applied – in fact, the STRUT value for younger speakers before the age transform is actually slightly retracted, much like in the present study and in data from the Canterbury QuakeBox corpus. Ageing does affect vocal tract resonances, in particular speakers' F1 frequencies (see e.g. Linville and Rens 2001; Xue and Hao 2003; Harrington et al. 2007; Eichhorn et al. 2017). However, there is no specific indication that the change in F2 across generations in Ross's raw data is purely a result of ageing vocal tracts. Therefore, due to the normalisation method taking START as a fixed point, it is not clear in the Auckland and Nelson data whether it is the STRUT or START vowel that is changing across generations.

Figure 3.17 demonstrates the effect of applying the Auckland normalisation method to the dataset of the present study.

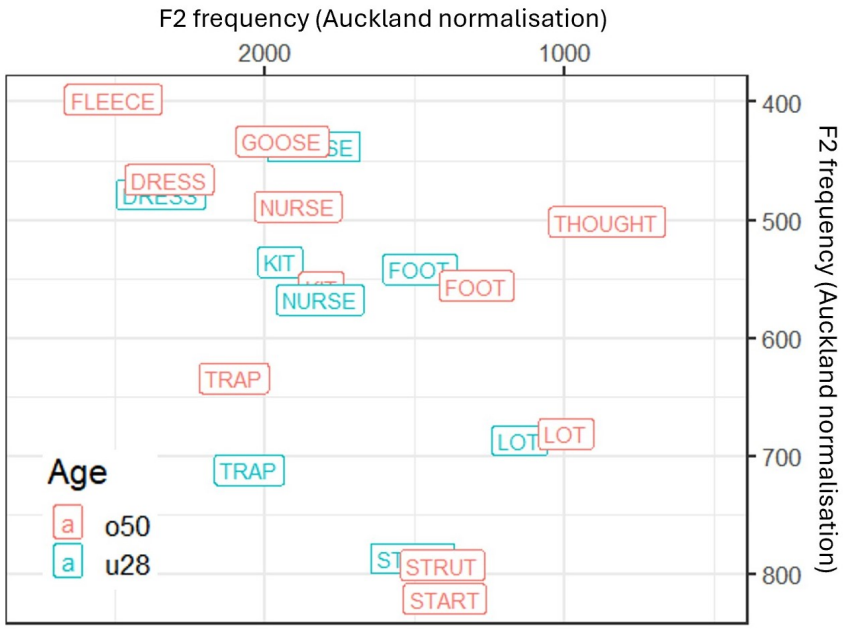


Fig. 3.17 Mean values from the present monophthong dataset, normalised with the Auckland method

Figure 3.18 presents the same data, but normalised with the Lobanov 2.0 method as used throughout the present study.

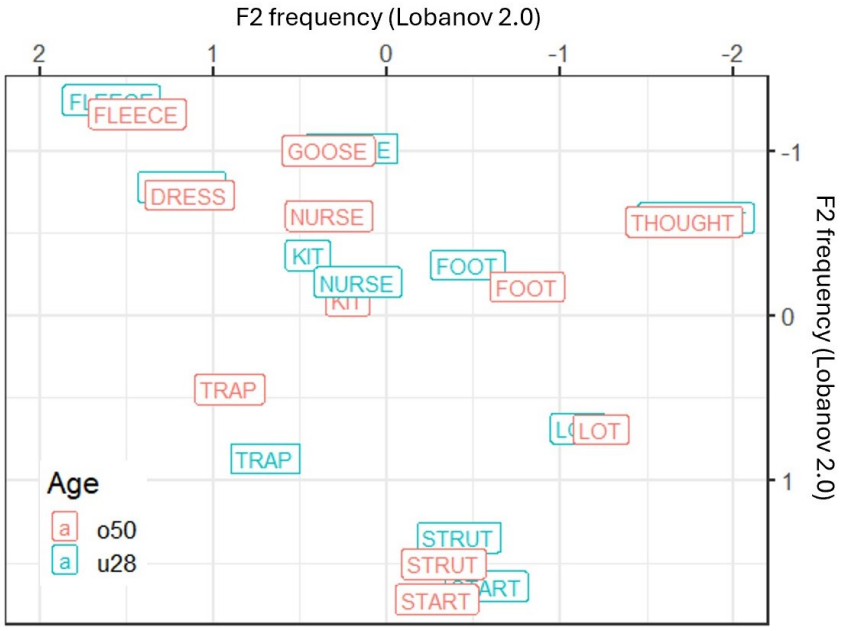


Fig. 3.18 Mean monophthong values from the present dataset, normalised with the Lobanov 2.0 method

After normalisation with the Lobanov 2.0 method, there was no STRUT-fronting in the data. However, when applying the Auckland method to the current dataset, the effect on STRUT is an apparent 'fronting' that only appears after fixing START across age groups. This is not the only major difference between the results of the two normalisation methods – in the above figure, LOT appears much more fronted, compared to the marginal difference found when using the Lobanov 2.0 method (see section 3.1.4). DRESS now appears lower for younger speakers that older speakers, whereas it appears higher when data are normalised with the Lobanov 2.0 method. Additionally, the age group differences for GOOSE and NURSE are exaggerated in the plot made with the Auckland method, with the GOOSE-fronting and NURSE-raising appearing more pronounced for older speakers, compared to the plot made using the Lobanov 2.0 method. These changes to the high front vowels appear to be the result of what is actually a marginally more central FLEECE target in older speakers (note that measurements were taken from later than the midpoint to obtain target values in speakers with salient onglides - see section 2.4), and possibly relates to the findings by Ross of a reduced dynamism of FLEECE across younger speakers in Auckland and Nelson. For the same reason, the movement of KIT appears much smaller in the Auckland-style plot, since the centroids of KIT and FLEECE are in fact moving in opposite directions when data are normalised with the Lobanov method.

Whilst neither normalisation method is perfect, it appears that the assumption of a complete lack of variation in FLEECE and START can warp the normalised position of neighbouring vowels. Therefore, the Auckland method of normalisation makes it impossible to distinguish between one scenario where STRUT is fronting but START is stable, and another where START is retracting but STRUT is stable. Indeed, Ross (2024:111) describes the fronting of STRUT as 'confusing' and lacking precedence, as well as not being visible when F1 and F2 frequency values were plotted within age and gender groups (and therefore pre-normalisation) for visual analysis.

Despite the findings in Auckland and Nelson being equally interpretable as STRUT-fronting or START-retraction, there are some other indications that it may in fact be START changing, as opposed to STRUT. For one, the complete lack of STRUT-fronting in the present study, as well as in the Canterbury QuakeBox data, would predict a lack of STRUT-fronting to be occurring in Nelson, since Christchurch and Wellington are Nelson's nearest larger cities. Furthermore, in the plotting of the Canterbury QuakeBox data, START can be seen to retract in both male and female speakers, with female speakers showing more consistent directionality between generations, and this retraction was found to be significant for men and women in

Hurring et al (2025). Additionally, AusE, which is more advanced in the process of vowel lowering than NZE (see section 1.4.1), underwent retraction, rather than fronting, of STRUT between the 1960s and 1990s, around the same time that TRAP began to lower in the same speakers (Cox et al. 2024). As STRUT and START form a length pair in both AusE and NZE, and since both varieties are undergoing short front vowel lowering, it is not unreasonable to expect the pair to behave similarly in both varieties. However, there is no direct evidence yet for START-retraction in NZE.

Whilst the retraction of START in the present study is at least partly an effect of accommodation to the interviewer, there are indications of a wider trend towards START-retraction in NZE. The lack of STRUT-fronting in Wellington and Canterbury, but presence of STRUT-fronting in Auckland and Nelson, is not a likely outcome of geographical variation, but would arise from the Auckland Voices Project's normalisation method if START is in fact retracting. Although NZE is not a "lagging Australian English", the progression of vowel shift reversal in AusE gives precedence to START-retraction when other similar changes are occurring. In addition to eschewing interviewers with British accents, a full investigation of the quality of START in younger speakers could be undertaken with the existing AVP data, using a normalisation method that doesn't require a fixed START value.

As discussed in section 1.4.2, STRUT and START are generally considered to form a length pair in NZE. Taking into account the accommodation effect on START discussed above, there is no reason to suggest that this is changing. Even if START is beginning to retract in NZE, AusE still retains the two vowels as a length pair (Easton and Bauer 2000; Ratko et al. 2023), even after STRUT has retracted in recent decades, as discussed above. Therefore, the findings of the present study further do not suggest movement away from the quantity distinction of STRUT and START in NZE.

3.2.4 NURSE

NURSE was found to undergo significant lowering in the present study, but this lowering was only apparent in the younger female speakers. Though the presence of the gender effect here raises suspicion of accommodation to the author's SSBE variety, as seen for START above, there is no evidence of accommodation occurring over the course of the interview (see section 2.7). Therefore, the lowering of NURSE is more likely to be a true innovation, as indeed mirrored in the findings for Auckland, Nelson, and possibly Canterbury, suggesting a potential variety-wide change could be occurring. However, the presence of a gender effect in Wellington is unexpected, as there is no such effect found in Auckland or Nelson, and

NURSE-lowering is also found for male speakers in QuakeBox (Hurring and Clark 2025; Hurring et al. 2025). Though there is no clear cause for the gender effect seen in NURSE-lowering here, it is worth noting that NURSE-raising in the 20th Century was led by female speakers, as discussed in section 1.4.3. Perhaps, then, the gender effect present in the data represents a change in gendered speech norms across generations, or a change in prestige accent features, though it is unclear why Wellington would differ from Auckland and Nelson in this respect.

Another interpretation could be that in all four cities, NURSE-lowering was led by women, but that Wellington is less advanced in the change, hence the stronger gender effect. However, this is unlikely for geographical reasons as Wellington is situated between Auckland and Nelson, and as such is unlikely to diverge from the two. As will be discussed in section 4.5.3, the NURSE lexical set is also a central player in re-emerging partial rhoticity. Though no rhotic tokens were included in the formant analysis, non-rhotic tokens were included from speakers who also produced rhotic NURSE tokens, with the exception of one participant whose NURSE-rhoticity was categorical (see section 4.5.2). It is possible that speakers with optional NURSE-rhoticity also have atypical realisations of non-rhotic NURSE, but since only one younger female speaker in the dataset produced tokens of both rhotic and non-rhotic NURSE (see table 4.2), this is unlikely to have affected the overall findings. Altogether, the presence of NURSE-lowering in younger Wellington speakers is not surprising, and supports the notion of a general change in NZE, but the strong gender effect is unexpected and lacks precedence in the other New Zealand cities where NURSE-lowering has been shown to take place.

3.2.5 FOOT and LOT

FOOT is significantly fronted by younger speakers in Wellington (figure 3.9). Ross (2024) showed FOOT-fronting to be taking place in Auckland, but she did not investigate FOOT in Nelson due to low token numbers. FOOT is also not included in the analyses of Canterbury speakers (Hurring and Clark 2025; Hurring et al. 2025), and was also excluded due to low token counts in Blackwood's study of kindergartners in the QuakeBox corpus (Blackwood 2022). Therefore, Auckland currently provides the only comparison point in New Zealand for recent changes in the FOOT lexical set. In AusE, FOOT has also significantly fronted, a change that appears to have been occurring since at least the 1960s (Cox et al. 2024), and FOOT-fronting has occurred in RP over a similar timescale (Hawkins and Midgely 2005). As discussed in section 1.4.4, FOOT appears to be undergoing some kind of split in NZE, with conditioning environments that are not fully understood but prototypically involve a fronted

variant in words such as *good* (hence 'gidday') as opposed to the more conservative retracted and rounded variant. Investigating how FOOT-fronting varies by phonetic context was beyond the scope of this study, partly because of FOOT's low frequency, and also because after exclusion of pre-lateral FOOT, which is often subject to neutralisation in NZE (see section 1.5.1), the remaining FOOT tokens in the corpus were mostly found in a limited number of higher frequency lexical items. This in itself is a concern, as higher lexical frequency is also associated with centralisation (Shi et al. 2005; Bybee 2001; Fidelholtz 1975), and so the restricted lexical contexts present in the corpus may be more central due to their high frequency. However, even if the split is responsible for the apparent fronting, the Auckland and Wellington findings converge, and both suggest that the FOOT-fronting in at least some contexts is advancing in younger speakers in NZE, a change that has been ongoing in AusE and RP/SSBE for some time.

Whilst there is no evidence of significant LOT-fronting in the present study (figure 3.10), Ross (2024) has reported significant LOT-fronting in Nelson, but not Auckland. This is the only significant change found by Ross in Nelson that is not present in her Auckland data (aside from the changes in KIT, which, as discussed in section 3.1.1, are more likely to be socially motivated). However, this fronting of LOT may in part be exaggerated by the Auckland normalisation method: as seen in figure 3.17, even change in START can affect the frontness of LOT when factored out in normalisation. Considering that the comparison of Auckland and Nelson speakers by Ross showed a difference in THOUGHT values between the two cities that fell just short of statistical significance ($p = 0.052$), it is quite possible that the significant LOT-fronting in Nelson is exaggerated by the normalisation method, and is likely more similar to the marginal fronting present in the Wellington corpus. During the 20th Century, LOT was shown by Brand et al. (2021) to retract over time in a 'reorganisation' of NZE's back vowels. Any fronting of LOT would therefore be a change in the general direction of the vowel's movements since the first recorded speakers in the late 19th Century. To date, however, there is no significant evidence in support of LOT-fronting in NZE.

3.2.6 FLEECE, GOOSE and THOUGHT

For the Wellington speakers in the present study, no significant change was found for FLEECE (figure 3.11). Ross (2024) has shown FLEECE to be undergoing change in Auckland and Nelson, with younger speakers, especially women, in both cities producing the vowel with a reduced onglide. Whilst investigating the dynamism of FLEECE was beyond the scope of the present study, care was taken to measure F1 and F2 frequencies later in the vowel for speakers with a salient onglide (see figure 2.3 for an example). The mean normalised F2 frequency for

the younger group is slightly higher, and therefore more to the front, than that of the over 50 group (1.59 for speakers under 28, compared to 1.44 for speakers over 50). However, this is not a significant difference, and likely results from target undershoot occurring in the older speakers, who tended to have more salient FLEECE onglides. Impressionistically, several speakers with more dynamic FLEECE realisations had a FLEECE target perceptually closer to [ɪ] than [i], and these realisations are likely leading to the different age group means. Though this is more likely to be derivative of a change in the dynamic properties of FLEECE in NZE, it still has implications for the Auckland normalisation method discussed above. Undershoot in FLEECE may lead to other high front vowels appearing fronter in speakers with dynamic FLEECE, and therefore exaggerate the retraction of lowering vowels in younger speakers such as DRESS and NURSE. It may also be the case that FLEECE is changing in quality outside of the reduction of onglides in younger speakers, but the large inter- and intra-speaker variation between relatively static and much more dynamic formant trajectories makes this a difficult vowel to investigate. Perhaps it is the case that for as long as some speakers retain significant dynamism in FLEECE, static measures of vowel quality, even when 'at the target', are not particularly informative and may have an adverse effect on fixed-corner normalisation methods.

There was also no significant variation found for GOOSE in the present study (figure 3.12). Similarly to FLEECE, GOOSE has an onglide for some speakers of NZE, and this onglide was found by Ross to be diminished in younger speakers. Fewer of the speakers in the present dataset had a pronounced onglide in their GOOSE vowel than in their FLEECE vowel, and this onglide typically involved a smaller F2 formant transition due to the more central position of GOOSE in the NZE vowel space (see figure 2.3 for an example). Nevertheless, measurements were taken from later than the midpoint in these speakers, to minimise the impact on any onglides on the reported F1 and F2 frequency values. The lack of any change in frontness between age groups for GOOSE suggests that the fronting of GOOSE in NZE is now a fairly stable feature, having occurred rapidly in the first half of the 20th Century. As dicussed in section 1.4.5, Brand et al. (2021) show the fronting of GOOSE peaking in speakers born around 1930, and plateauing fairly suddenly in subsequent generations. As the oldest speakers in the present study were born around 1940, the lack of fronting in the dataset suggests that GOOSE-fronting began to plateau in Wellington at least as early as in Canterbury. The QuakeBox data, the modelling by Brand et al., and the Wellington data all show GOOSE as slightly retracted in younger speakers, but in the present study this was not found to be statistically significant. Unlike the difference in means found for FLEECE, this difference is in the opposite direction to any potential target undershoot by speakers with

onglides. Overall, the findings from the present study support the conclusion that GOOSE has reached a stable position in the NZE vowel space after its rapid fronting in the 20th Century.

Much like FLEECE and GOOSE, there was no significant variation found for THOUGHT in the present study. Especially in open syllables, THOUGHT can have quite an extreme offglide in NZE (see figure 2.4), with realisations approaching [oə] or even disyllabic [o.ɐ], and unlike FLEECE and THOUGHT dynamism, this does not appear to be disfavoured by younger speakers. Interestingly, as briefly discussed in section 2.7, THOUGHT showed a marginally significant change in backness over the course of the interview, suggesting that speakers were beginning to accommodate to the author's accent. It is also worth noting that the author's THOUGHT vowel was accommodating to speakers during the interviews, showing a significant offglide and having a more similar auditory vowel quality to the NZE THOUGHT vowel. An example of this is shown below in figure 3.19:

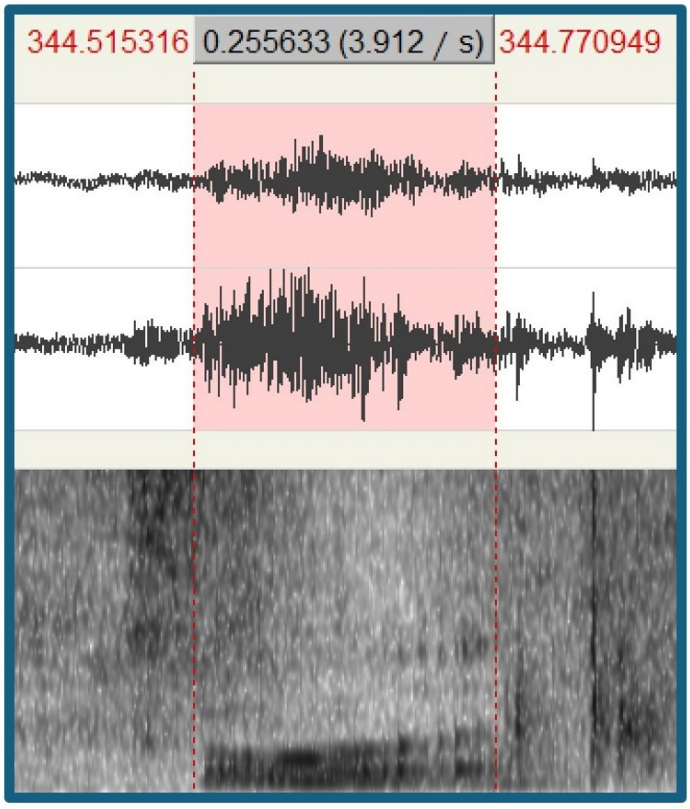


Fig. 3.19 THOUGHT as produced by the author during data collection

This complicates the assumption that change over the course of the interview was merely accommodation to the author's vowel system, since the change was not in the direction of the author's THOUGHT vowel. THOUGHT is shown by Brand et al. (2021) to have been fronting since around 1910, but the lack of fronting shown here would suggest that THOUGHT has now reached a more stable position in the NZE vowel space.

3.2.7 Monophthongs: summary

Several monophthong changes appear to be taking place in Wellington's younger speakers. The lowering of TRAP is very pronounced, and suggests a variety-wide lowering that has been taking place over the last few decades, much like earlier changes in other global English varieties. KIT also appears to be moving towards the high front corner of the vowel space, a change that has not been observed in Auckland and that also does not seem to result from accommodation to the author, although this cannot be entirely ruled out. Despite these changes to the other two short front vowels, DRESS remains at a constant high front quality for all age groups, contradicting Ross's findings in Auckland and Nelson but seemingly mirroring a lack of DRESS-lowering (and, in fact, continued DRESS-raising) in Christchurch. The findings of STRUT stability and START-retraction contrast with the observations of Ross in Auckland and Nelson, but closely match findings in Canterbury, a distributional pattern with very little geographical sense. It is argued that this is in fact due to methodological differences, and that START-retraction is also a variety-wide change, like TRAP-lowering. However, the presence of an accommodation effect in the present study makes this conclusion slightly more tentative, and further investigation is needed. NURSE-lowering is occurring in the speech of young women in the present study, representing a newly observed gender effect in a change that is arguably occurring across NZE. FOOT is fronting, another change that is becoming increasingly evidenced in NZE, though the linguistic conditioning of the change is poorly understood. LOT is not fronting, and once again it is argued that the previously reported LOT-fronting in Nelson is in fact the result of methodological differences. The high long vowels FLEECE, GOOSE, and THOUGHT are not undergoing any apparent change in target, though it is likely that there is some change occurring in these vowels' dynamic formant trajectories.

Chapter 4

Liquids: Results and Discussion

4.1 L-vocalisation: results

4.1.1 Overall level of vocalisation

5,660 tokens of rhyme /l/ were annotated, with 4,272 tokens produced in the picture description task and 1,388 tokens in the reading task. Some tokens were unclear both visually and auditorily, and were excluded from further analyses. Of all tokens annotated, 45.1% were vocalised, representing 49.7% of tokens after the exclusion of unclear tokens.

4.1.2 Age and gender

Age and gender both had a significant effect on l-vocalisation, and there was also a significant interaction effect between the two. Figure 4.1 shows the rates of l-vocalisation for each age group, by gender.

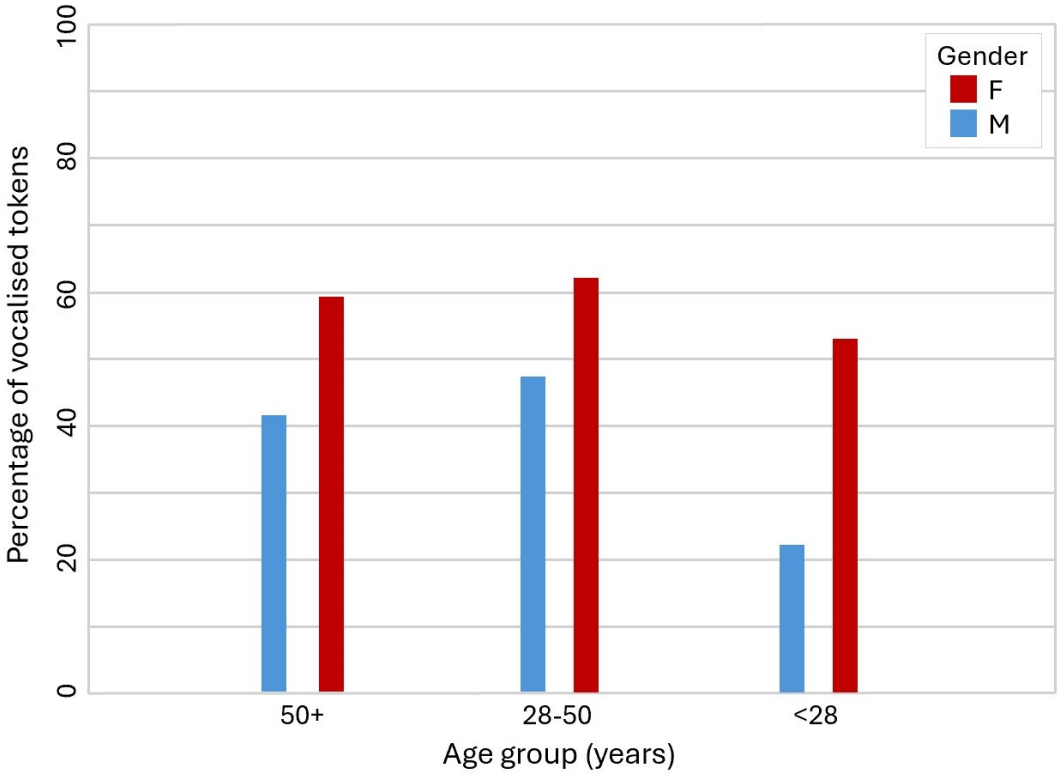


Fig. 4.1 % l-vocalisation by gender and age group (tasks combined)

Women produced a higher proportion of vocalised tokens compared to men across all syllable positions ($\beta = 1.012,\ p < 0.0001$). Younger speakers across the board tended to vocalise /l/ at a lower rate, and this was significant ($\beta = -0.0108,\ p = 0.0006$). However, as visible in the figure above, this was particularly the case for young men, whose rate of l-vocalisation is under half that of their female counterparts. This interaction between age and gender is statistically significant ($\beta = 0.0407,\ p < 0.0001$).

4.1.3 Task

Figure 4.2 shows the rate of l-vocalisation in each task, for each age group.

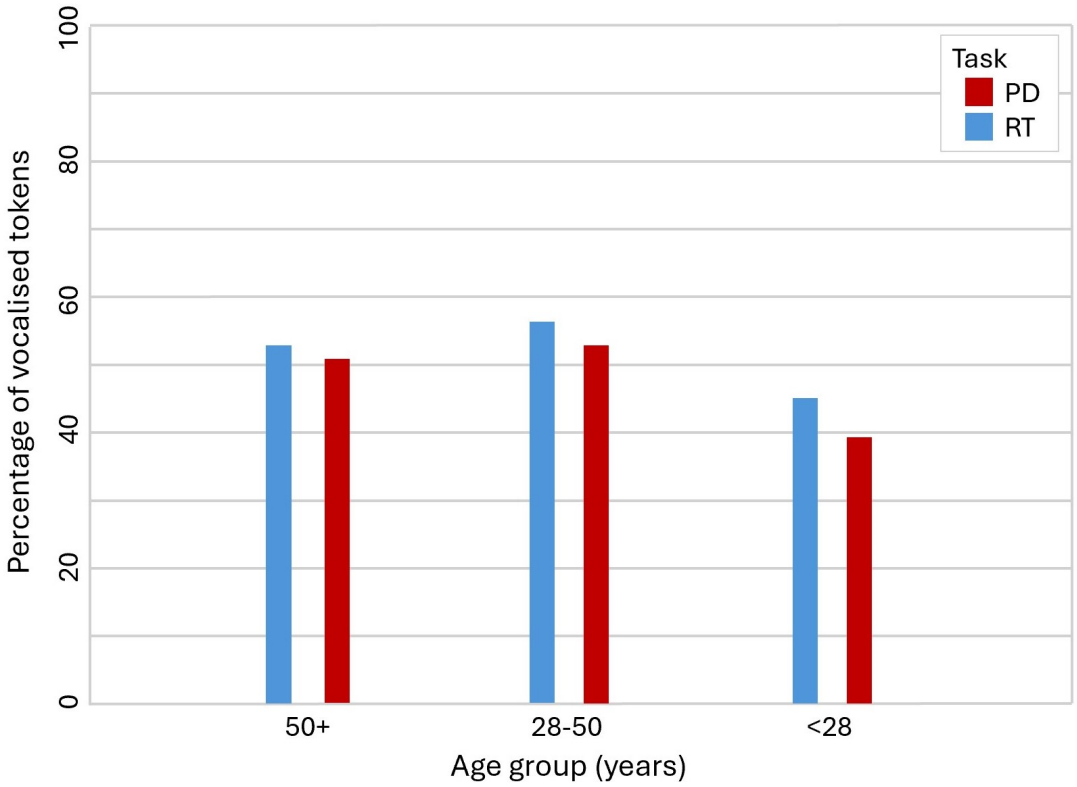


Fig. 4.2 % l-vocalisation by task in each age group. PD = picture description; RT = reading task

There was no significant effect of task on the rate of l-vocalisation ($\beta = -0.021$, $p = 0.8$).

4.1.4 Syllable position

Table 4.1 presents the number of rhyme /l/ tokens, by syllable position and type (vocalised, unvocalised, unclear).

Table 4.1 Rhyme /l/ token counts by syllable position and variant

Variant	Syllable position		
	Syllabic	Coda	Cluster
Vocalised	1520 (49%)	796 (36%)	192 (56%)
Unvocalised	1208 (39%)	1205 (55%)	121 (35%)
Unclear	385 (12%)	201 (9%)	32 (9%)
Total	3113	2202	345

Figure 4.3 shows the percentage of vocalised /l/ for each syllable position in the three age groups.

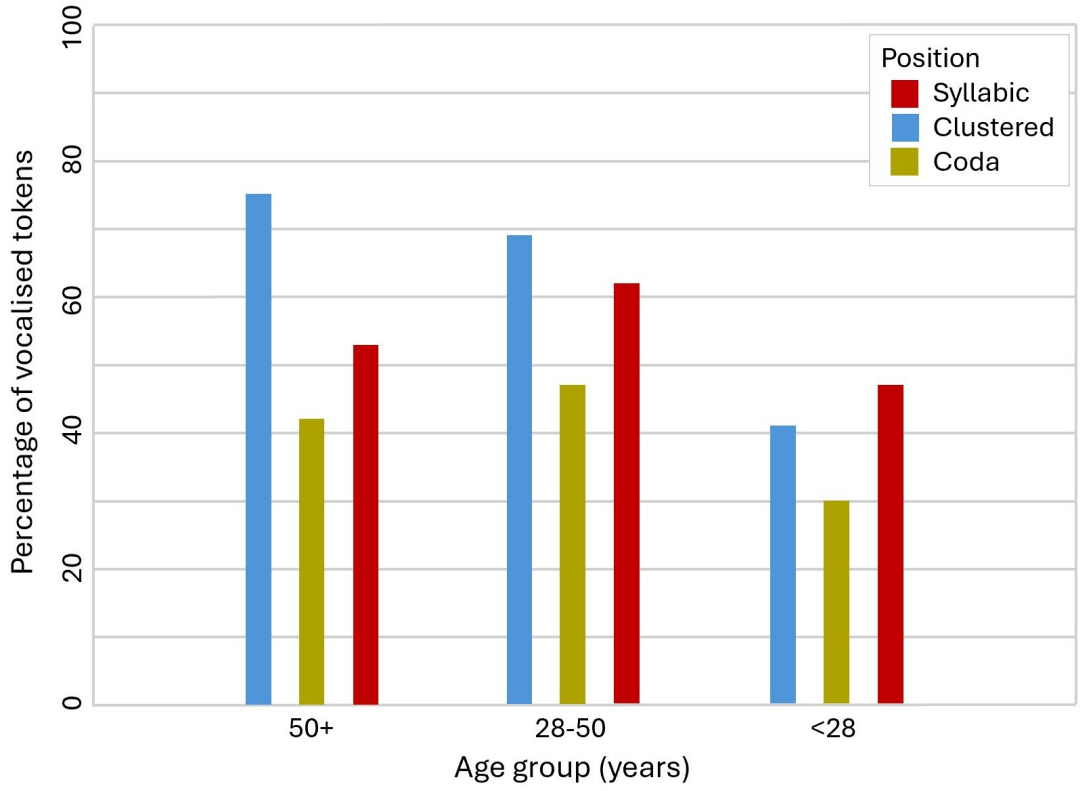


Fig. 4.3 % l-vocalisation by syllable position in each age group

The highest rate of vocalisation is seen for cluster contexts, followed by syllabic contexts, and /l/ in coda position was significantly less likely to be vocalised than in the syllabic or consonant cluster positions ($\beta = -1.21,\ p < 0.0001$).

4.1.5 Phonetic environment

Figure 4.4 shows the rate of l-vocalisation for each age group by preceding phonetic context.

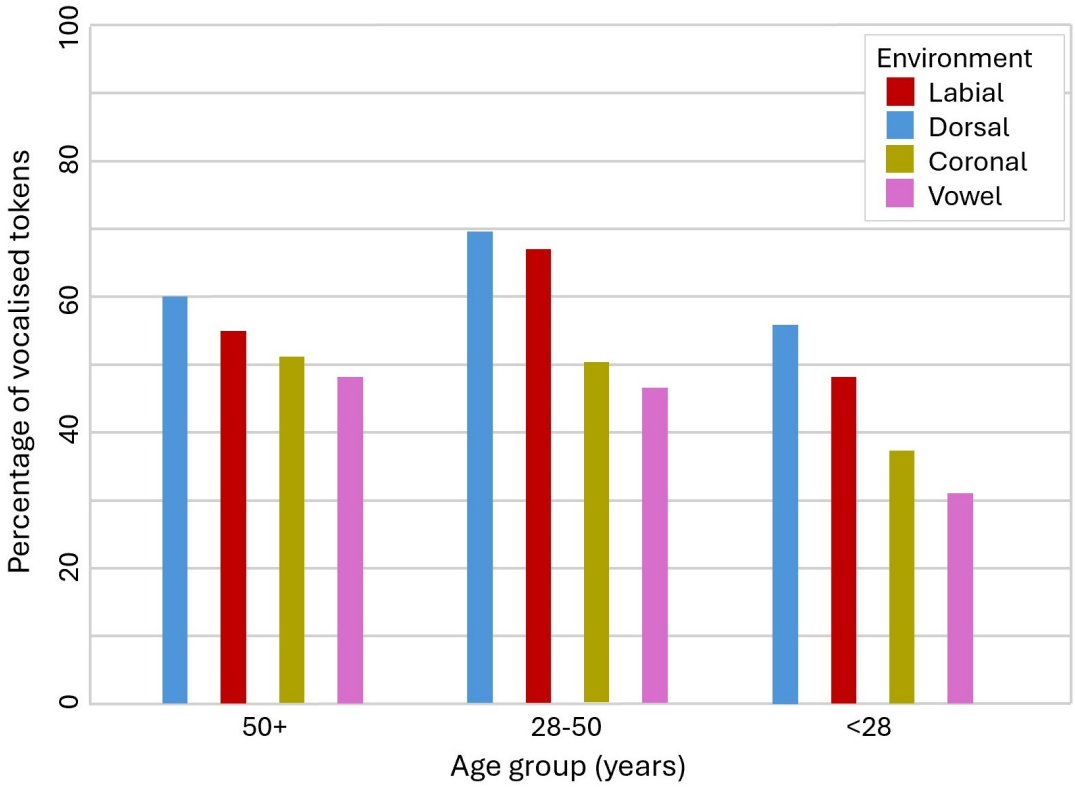


Fig. 4.4 % l-vocalisation by preceding environment for each age group

Labial is the most preferred preceding environment and had a significant positive effect on the odds of l-vocalisation ($\beta = 1.18,\ p < 0.0001$). The next most preferred were dorsal environments, preferred above coronal environments, themselves preferred above vowels.

Figure 4.5 shows the rate of l-vocalisation for each age group by following phonetic context.

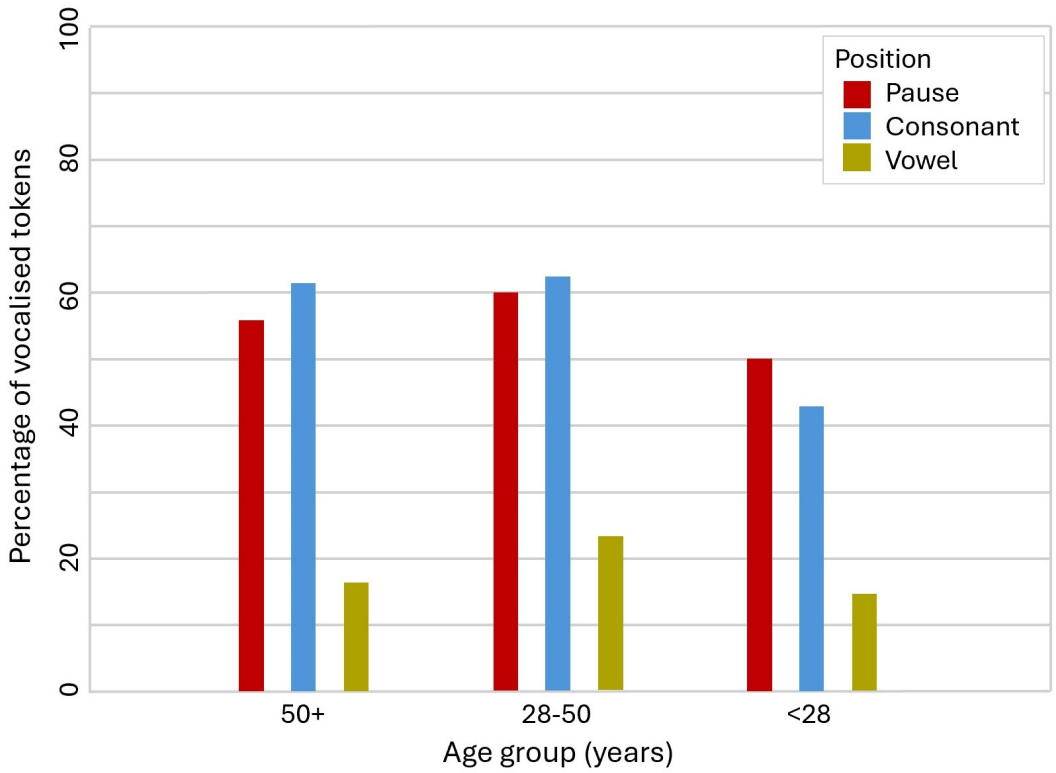


Fig. 4.5 % l-vocalisation by following environment for each age group

Following phonetic environment was also found to have a significant effect on the likelihood of vocalisation, with pre-vocalic /l/ significantly less likely to be vocalised ($\beta = -2.32,\ p < 0.0001$).

4.2 L-vocalisation: discussion

4.2.1 Overall vocalisation level

As stated in section 4.2.1, 49.7% of non-discarded rhyme /l/ tokens were vocalised in the present study. This figure is substantially lower than previous estimates for NZE: as discussed in section 1.5.1, Horvath and Horvath (2001) found l-vocalisation in 58% of read tokens by Wellington speakers, but described this as a 'conservative estimate', and Kennedy (2006) estimated younger speakers' vocalisation rates to be reaching 84% in casual interviews. Both of these studies, much like the present study, only described tokens as 'vocalised' if unambiguously so, and it is possible that the lower estimate in the present study is the

result of overly conservative annotation. However, the percentage of tokens excluded in the Wellington data, at 10.9%, is very comparable to the proportion of tokens labelled as 'unclear' by Kennedy (2006), at 9%. Therefore, it seems to be more likely that the decrease in average vocalisation rate is due to a higher proportion of unvocalised /l/ tokens in the present dataset. These figures are still much higher than Horvath and Horvath's estimate of 21.6% vocalisation in AusE (2001), but are lower than contemporary estimates of l-vocalisation rates in the south of England, as discussed in section 1.5.1. Whilst l-vocalisation is clearly well established in NZE, it is certainly not 'near categorical' to the extent of some other varieties, and appears to be occurring at a rate lower than the estimates of two decades ago.

4.2.2 Age and gender effects

Age trends in the present dataset can potentially help to explain why the figure of overall vocalisation is lower in this study when compared to earlier studies of NZE (see section 1.5.1). The younger speakers in the datasets used by Horvath and Horvath (2001) and Kennedy (2006) are likely born between the 1980s and the early 1990s, and so fall into the middle of the three discrete age groups in the present study (28 to 50 years old, 1974-1997). Previous studies of l-vocalisation in NZE have all concluded that the change is still progressing in the variety: Horvath and Horvath state that the trend towards higher levels of vocalisation in younger speakers is "unambiguous" (2001:44), with a clearer age effect shown for NZE compared to AusE, and Kennedy (2006:65) cites her participants' younger age as a potential explanation for the apparent increase from Horvath and Horvath's findings. However, the present study shows evidence towards the opposite trend: there is a statistically significant decrease in l-vocalisation by younger speakers. As discussed above, the middle group in the present study roughly corresponds to the younger speakers in Horvath and Horvath's study, and indeed their rate of vocalisation for younger Wellington speakers was relatively similar to the present study, at 62% of tokens compared to 54.5% in the present study. The significantly lower rate of l-vocalisation by younger speakers is directly contradictory to the notion that l-vocalisation is a progressing change in NZE. One speculative explanation for this stagnation could be exposure to General American English in media consumption, especially given the rise of social media: engagement with media featuring high levels of l-vocalisation has been suggested to correlate with increases in vocalisation (Stuart-Smith et al. 2013), and General American English does not typically vocalise /l/ in rhyme position (though l-vocalisation is becoming more prevalent, according to Kretzschmar 2004). Though the trends in the Wellington dataset are difficult to explain at this stage, the apparent conclusion that l-vocalisation is on the decrease in NZE is surprising, given the strong conclusions of

past research and the status of the variety as a 'leader' in the change (Horvath and Horvath 2001, 2002).

As shown in figure 4.1, women produce /l/ as vocalised significantly more than their male counterparts across all age groups, and this difference is much wider in the youngest age group. This is intriguing, as strong gender trends in l-vocalisation in NZE have not been commented on in the existing literature, aside from Horvath and Horvath's non-significant observation of a 'weak' trend for higher rates in women (see section 1.5.1). As also discussed in section 1.5.1, Ellingsæter (2014) did find a significant gender difference between vocalisation rates in younger speakers in Surrey, but this was in the opposite direction, with young men displaying higher rates of vocalisation than their female counterparts. However, l-vocalisation is on the increase in Surrey, whereas it appears to now be on the decrease in Wellington. It is not enough to simply conclude that in both cases, men are favouring the 'innovative' variant, as men were vocalising less than women even when vocalisation was on the increase in the variety, as shown in Horvath and Horvath's data. Instead, it appears that young men have moved towards a more conservative lower /l/-vocalisation rate, at a far faster rate than young women. Perhaps, following the leading of the increase by female speakers, l-vocalisation is becoming a markedly gendered variable in NZE, and the gender disparity is now increasing as a result, as young men assume more 'masculine' speech styles. It seems that to thoroughly understand why l-vocalisation rates are dropping so much for young men, more detailed social information would be required regarding the speakers' attitudes and linguistic awareness - information that is beyond the scope of the present study. However, the clear gender effect across age groups is a notable finding and represents a new point of information regarding the change's diffusion through, and potentially out of, NZE.

4.2.3 Task

There was no significant effect of task on the rate of l-vocalisation (figure 4.2). This is a little surprising, as an effect of style on l-vocalisation is reported by Wright (1989), and also because Kennedy (2006) partly explains her high rates of l-vocalisation as an effect of the casual speech style in her dataset. As a general rule, segment reduction is affected by speech style, being more present in informal speech (Nolan and Kerswill 1990), and so a higher rate of l-vocalisation in the more informal picture description task would be expected. However, the lack of decreased vocalisation in the reading task suggests that either speakers are completely unaware of vocalisation in their own speech, or that they consider l-vocalisation to be a part of careful speech style. Given that the gap between styles is not statistically significant, the first of these explanations is perhaps more likely, with

l-vocalisation simply not affected by style. The lack of change when reading out loud also suggests a lack of orthographic influence on l-vocalisation, potentially because the segmental structure itself is unchanged in most cases of l-vocalisation, with the exception of l-deletion following THOUGHT, where deletion occurs instead to produce, for example, [bɔː] for /bɔːl/, 'ball'. Ross (2024) notes that in the AVP corpus, older women were more likely to produce very raised DRESS and TRAP vowels, as well as previously stigmatised diphthong variants. She suggests that this could reflect a change in the hierarchy of prestige within NZE, with these variables coming to be considered more conservative and prestigious when they were once considered innovative and non-prestigious. Perhaps l-vocalisation is facing a similar change, being so well established in the speech of older women who are generally expected to utilise more prestigious variants in their speech (Trudgill 1974; Angle and Hesse-Biber 1981). If this were the case, and l-vocalisation has come to be associated with prestige, this could explain the lack of effect of task on the rates of l-vocalisation.

4.2.4 Effect of syllable position

As shown in section 4.2.4, cluster contexts demonstrated the highest rate of vocalisation in the present study, followed by syllabic contexts, with /l/ in coda position being the least likely to undergo vocalisation. This result does not quite match the findings for Wellington speakers interviewed surveyed by Horvath and Horvath, who greatly preferred l-vocalisation in syllabic contexts above both cluster and coda /l/, which were equally vocalised around 45% of the time. However, it does correspond somewhat to their findings from Christchurch, where syllabic and clustered /l/ were both often vocalised, with coda /l/ by far the least likely to undergo vocalisation. As discussed in section 1.5.1, Horvath and Horvath suggest a pathway for the diffusion of l-vocalisation in Australia and New Zealand, led by Christchurch. If l-vocalisation in New Zealand is still diffusing outwards from Christchurch, as they suggest, then it would be expected that Wellington's distribution of l-vocalisation 25 years later would begin to resemble that of their Christchurch findings. However, the higher rate of vocalisation in cluster contexts, above syllabic contexts, was not found in any of Horvath and Horvath's New Zealand locations. There is a possibility that it represents a stage beyond their findings, since l-vocalisation in clusters is approaching that of syllabic /l/ in their Christchurch data from the late 1990s.

Whilst there is a decrease in l-vocalisation rates for each younger age group in all three contexts, this decrease is most salient for clustered /l/, for which the vocalisation rate drops below that of syllabic /l/ for the youngest speaker group. This change in distribution for younger speakers is, in effect, illustrating the reverse of Horvath and Horvath's proposed

pathway: whereas they show clustered /l/ vocalisation increasing at a rate faster than the overall vocalisation rate, the results here show clustered /l/ vocalisation decreasing faster than other contexts as the overall rate falls. This may, however, have more to do with the fact that on the occasion when l-vocalisation is commented on by prescriptivists, it usually in cluster contexts. The instances of complaint given by Hay et al (2008:35) concern the pronunciation of *always* as "aw-ways", *vulnerable* as "vunnerable", *walnut* as "warnut", and the prototypical case *milk* as "mook" – all cluster contexts, despite the cluster environment being less frequent in spontaneous speech than coda or syllable /l/. Perhaps the particularly rapid fall in cluster contexts is not due to a linguistic constraint, but is in fact due to extralinguistic factors such as metalinguistic awareness and stigmatisation that particularly affect cluster contexts.

The preference for vocalisation in syllabic contexts above coda contexts for each of the three age groups is a finding consistent with Horvath and Horvath's results for all three New Zealand cities included in their study, a pattern not seen in any of their Australian cities. In this respect, the findings correspond well and suggest a level of continuity in the syllabic conditioning of l-vocalisation in NZE, despite the reversal of apparent time trends in overall vocalisation level.

4.2.5 Phonetic context

As shown in figure 4.4, labial consonants were the most frequent preceding environment for the Wellington speakers, followed by dorsal, coronal, and vocalic environments. This distribution closely echoes the findings of Horvath and Horvath for NZE, but was not found to be the case in their AusE data, where labial environments were dispreferred (see section 1.5.1). Horvath and Horvath's NZE hierarchy was also found to apply consistently across all three age groups in the current dataset. The present study therefore shows a stability in the conditioning of preceding linguistic environment for l-vocalisation in NZE. This stable hierarchy contrasts with the variable hierarchies found in Fenland English by Johnson and Britain (2007), and in Southend and Colchester by Spero (1996) (see section 1.5.1).

Following phonetic environment was also found to have a significant effect on the odds of vocalisation (figure 4.5), with following vowels being associated with significantly less vocalisation. This is unsurprising, as across varieties of English, l-vocalisation is less common before following vowels, sometimes being blocked by a clear 'linking l' variant, as seen in Fenland English (Johnson and Britain 2007). As discussed in section 1.6, l-vocalisation pre-vocalically is typically assumed to only arise when vocalisation is well established in a variety, as seen by the pre-vocalic l-vocalisation used by younger speakers in London (Tollfree 1999),

Surrey (Ellingsaeter 2014), Colchester (Spero 1996; Meuter 2002), and Southend (Spero 1996). This is supported by the data in the present study, in that the middle age group, with the highest rate of l-vocalisation, were the most likely to produce vocalised /l/ pre-vocalically, and the youngest speakers, with the lowest rate of vocalisation, were least likely to produce /l/ as vocalised before a following vowel. There was little difference found between the effect of following pause and following consonant, although there was a marginally significant inhibitive effect of a following pause ($\beta = -0.16, p = 0.052$). In their investigation of NZE, Horvath and Horvath found a following pause to be more conducive to l-vocalisation than a following consonant, but in Christchurch they found the two to be almost identical. As shown above, the two older age groups in the present dataset produced vocalised /l/ more frequently before consonants than before pauses, supporting the possibility that Horvath and Horvath's data shows a rising preference for vocalisation in pre-consonantal contexts. However, the younger speakers in the present study produced vocalised /l/ pre-pausally more frequently than pre-consonantally, suggesting that the difference in rate between pre-consonantal and pre-pausal l-vocalisation is not particularly stable compared to other conditioning factors.

4.2.6 L-vocalisation: summary

Results from the present study suggest that l-vocalisation is in a moment of flux in NZE, having previously been "unambiguously" progressing through the variety. The average level of vocalisation present in the dataset is substantially lower than previously reported results in the late 1990s and early 2000s, and the youngest speaker group in the present study produced significantly fewer vocalised /l/ tokens, representing a potential reversal of the change's progress. Speakers between the ages of 28 and 50, corresponding to the young, innovative speakers of earlier studies, produced the highest level of l-vocalisation, suggesting that the apparent-time findings of these earlier studies represent the 'peak' of l-vocalisation occurring in speakers born in the 1980s and 1990s. The lack of style effect in the dataset is surprising, and has potential implications for the prestige status of l-vocalisation in speakers of NZE, as a reduction of vocalisation in the read passage was expected. The significantly higher rate of vocalisation in female speakers is also unexpected, and has not been commented on in other varieties with l-vocalisation, other than Horvath and Horvath's tentative observations. The association between gender and l-vocalisation also has implications for prestige, further suggesting that vocalisation is far from stigmatised in NZE. The interaction of age and gender, with young men displaying a dramatic drop in vocalisation rates compared to young women, is intriguing and has no clear cause at this stage. The conditioning environments for l-vocalisation appear relatively stable, and correspond well with the existing literature on the phenomenon.

4.3 R-liaison: results

R-liaison was highly variable between speakers. As well as ‘linked’ and ‘unlinked’ tokens, where /r/ was simply present or absent, a third category became apparent during transcription. This category, ‘dual’, represents a variant produced by some speakers, where a glottal closure occurs after the linking /r/. For this variant, *car alarm* would be pronounced [kɐːɹʔəlɐːm]. These dual tokens were counted as instances of linking /r/ throughout the logistic regression analysis. Figure 4.6 shows an example of a dual liaison token as seen in the spectrogram.

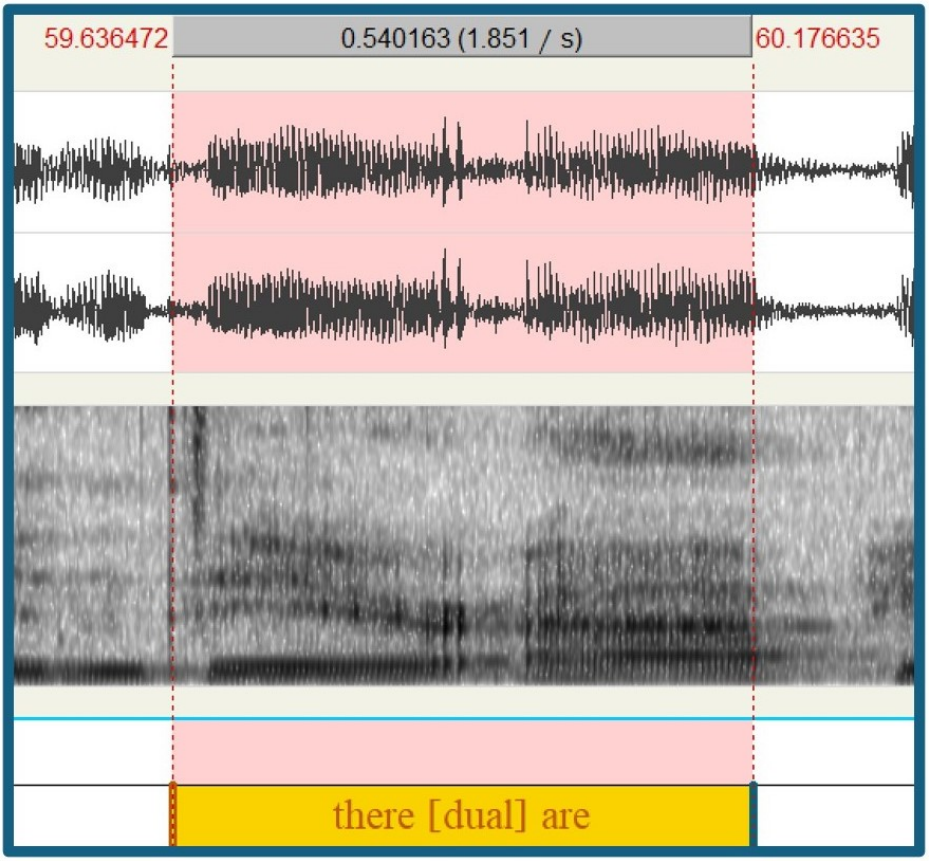


Fig. 4.6 An example of a glottalised linking /r/ as seen in the spectrogram

4.3.1 Age

Figure 4.7 shows the rate of linking /r/ production by age group.

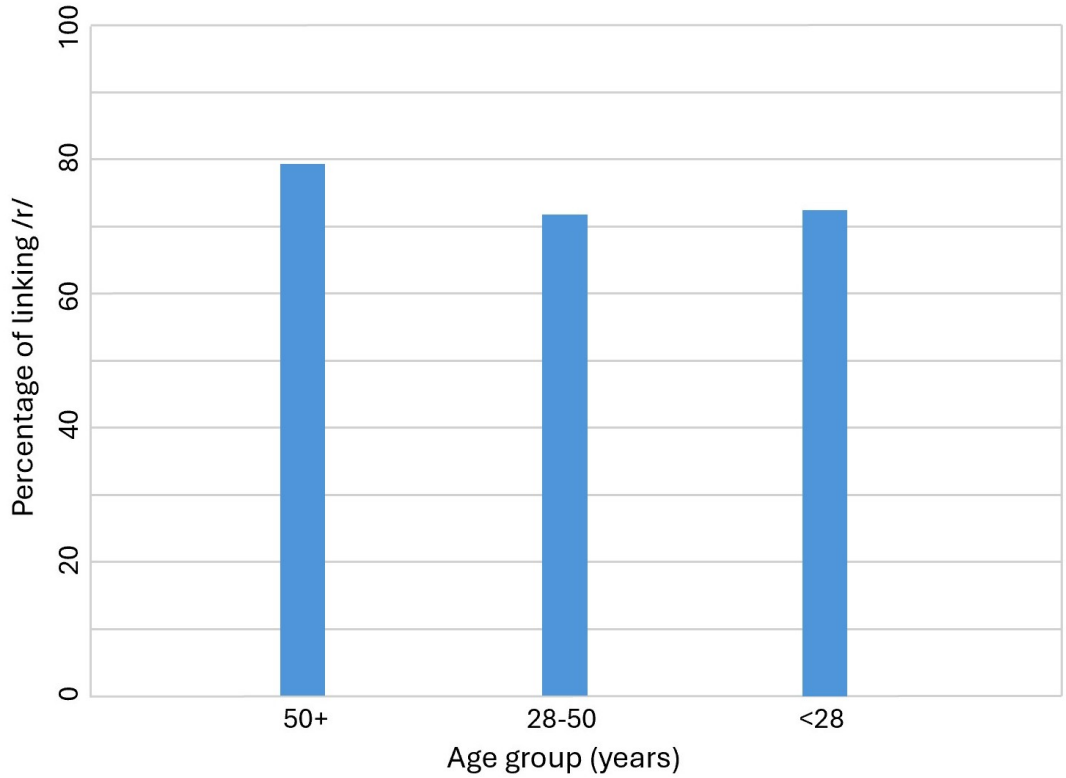


Fig. 4.7 % of linking /r/ production by age group, both tasks combined

The odds of linking /r/ presence did not vary significantly with age ($\beta = 0.0079$, $p = 0.31$)

4.3.2 Gender

Figure 4.8 shows the proportion of linking /r/ used by male and female speakers across both tasks.

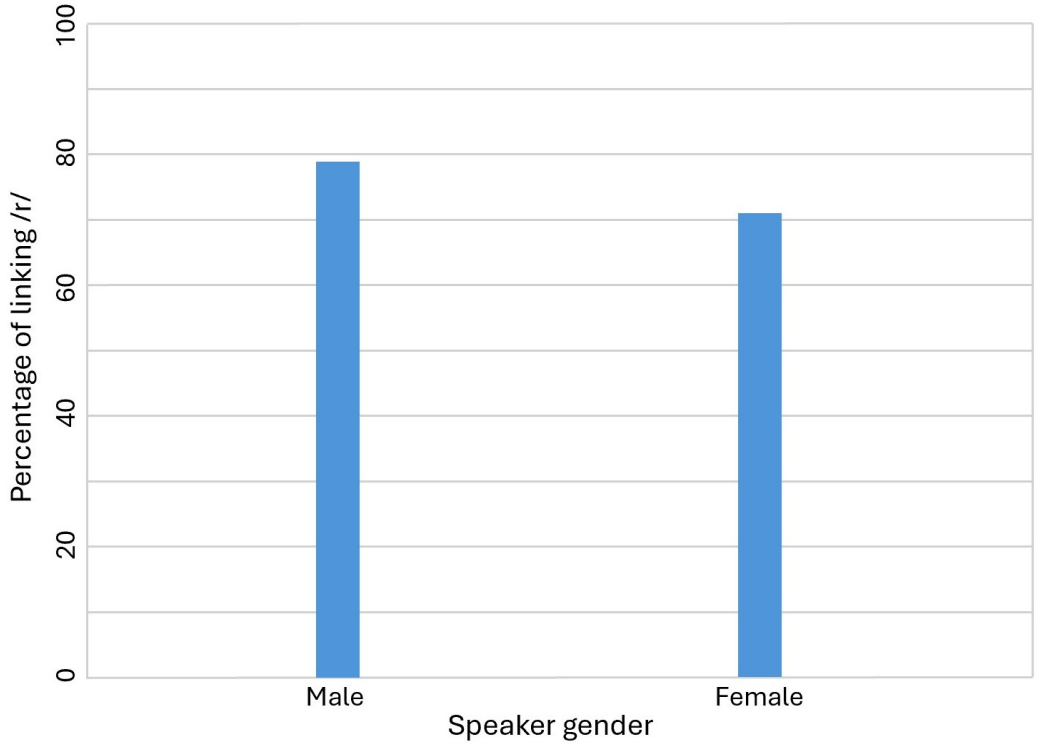


Fig. 4.8 % of linking /r/ production by male and female speakers, both tasks combined

The average rate of linking /r/ produced by male speakers was higher than the rate for female speakers, but at a level somewhat above the significance threshold of $\alpha = 0.05$ ($\beta = 0.51,\ p = 0.085$).

4.3.3 Task

Figure 4.9 shows the proportion of linking /r/ in the two tasks, spontaneous and read.

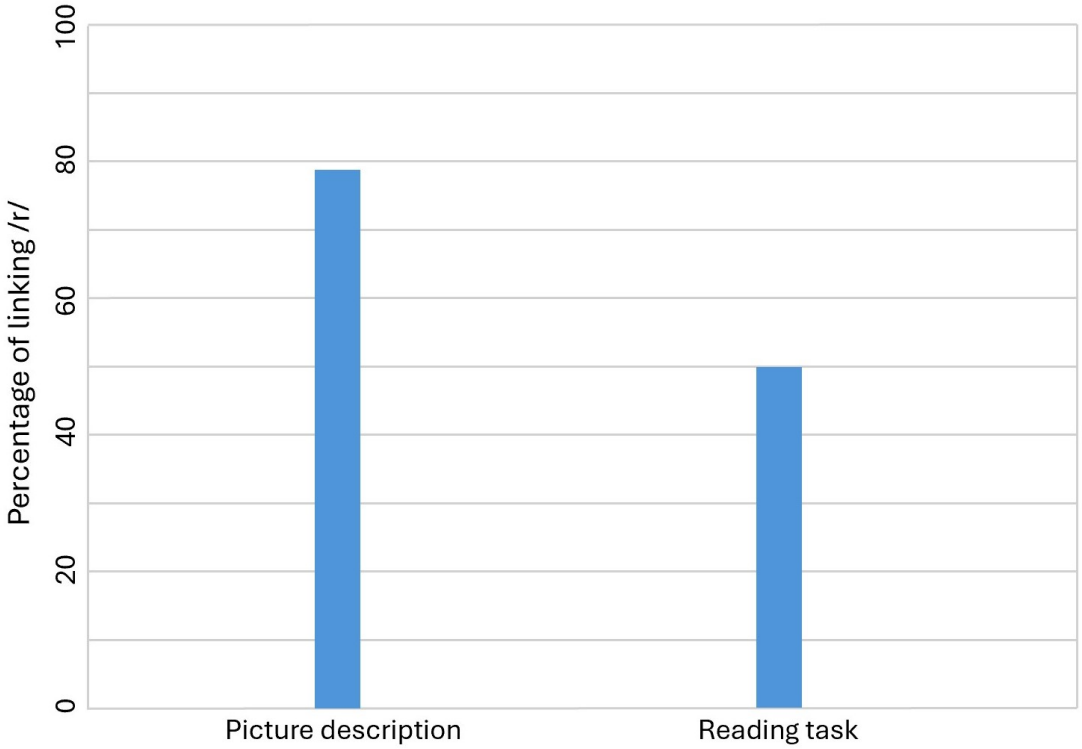


Fig. 4.9 % of linking /r/ production by task

There was a significant effect of task on the frequency of linking /r/ production, with speakers being far less likely to produce linking /r/ in the reading task ($\beta = 1.34, p < 0.0001$).

4.4 R-liaison: discussion

4.4.1 Glottalised linking /r/

The presence of 'dual' linking r-tokens, which contain both a linking /r/ and a glottal constriction, was unexpected, as this form of linking /r/ has not been acknowledged in much of the existing literature on l-vocalisation, and as of yet has not been noted in NZE. Many detailed phonetic studies of linking /r/ make no mention of glottalisation, aside from as an alternative hiatus resolution strategy when /r/ is not produced in linking contexts (e.g., Pavlìk 2016; Mompeán and Mompeán-Guillamón 2009; Mompeán 2011; Allerton 2000, Foulkes 1997). However, after the discovery of the dual tokens in the present dataset, two

mentions of this variant were found upon re-examining the literature: one in a study of the late Queen Elizabeth II's speech (Mompean 2022), and one in a study of AusE (Cox et al. 2014). Interestingly, neither study was analysing spontaneous speech; the data in the former were taken from the annual royal Christmas messages, which are scripted, and the latter study used a corpus of speech from a reading task. Orthographic influence has been previously demonstrated to increase the realisation of /r/ (Turton and Lennon 2023), but the presence of the dual linking strategy in the spontaneous data from the present study suggests that the phenomenon is not orthographically motivated. The rate of dual-strategy /r/ liaison in these two studies is low, at 3.4% (26 tokens) in the Queen's speech and once again 3.4% (101 tokens) in the AusE speakers. The rate of dual-strategy liaison in the present study is higher than either of these results, at 7.8% (105 tokens) across tasks. Additionally, dual-strategy tokens are more frequent in the spontaneous speech task, at 8.1% (97 tokens), than in the reading task, at 5% (8 tokens), and though this difference is small, it indicates further that dual-strategy liaison is not orthographically motivated. There were no significant predictors for the use of the dual strategy above simple r-liaison, and so dual tokens were considered as 'present' tokens for all further analyses, an approach also used by Mompeán and by Cox and colleagues. Further investigation is needed to ascertain when this dual strategy arose in NZE, and to further clarify whether it is truly more frequent in spontaneous speech.

4.4.2 Age effect

The lack of age effect found in the present study (figure 4.7) contrasts with the findings of Marsden (2017), who found teenagers in her study of NZE used linking /r/ less often than their older counterparts. The proportion of linking /r/ realisation by older Wellington speakers in this study, at 81.8% of opportunities in spontaneous speech, is very similar to Marsden's finding for older speakers, at 80%, but the proportion remains similar for younger speakers, with the middle age group producing 74.6% of possible links and the youngest speakers producing 77% of possible links, both substantially higher than Marsden's figure of 66% for her teenage speakers. This calls into question Marsden's conclusion that linking /r/ in NZE is on the decrease. Alternatively, this difference in findings could also be a matter of region, as Marsden finds higher use of linking /r/ in town 'C', which is much closer to Wellington than the other town in her study, town 'N'. Cox et al. (2014) also found no overall decrease in linking /r/ by younger AusE speakers, except for in contexts where a weak syllable is followed by a strong syllable (e.g. *never over*). The prosodic context of linking /r/ opportunities was not analysed in the present study, but should be considered in further investigations. There is no evidence in the current dataset for a change away from typical linking /r/ liaison strategies, which contrasts with research arguing for a gradual decrease in

linking /r/ over the past several generations in NZE and some British Englishes (Hay and Sudbury 2005; Marsden 2017; Foulkes 1997; Allerton 2000).

4.4.3 Gender effect

As shown in figure 4.8, there was a slight difference in average rate of linking /r/ between male and female speakers in the present study, but not above the level of significance. Whilst Marsden (2017) found no effect of gender in her results, linking /r/ has been previously shown to be used by men more frequently during the development of r-liaison in NZE (Hay and Sudbury 2005; Hay and Maclagan 2012). A marginal effect of gender was also found by Bauer (1984) in the same direction, along with a lower frequency of intrusive /r/. There are competing hypotheses for why this gender effect might be the case: Hay and colleagues suggest that women are leading the change away from linking /r/, whereas Bauer suggests that women use less linking /r/ due to avoidance of intrusive /r/, which is more stigmatised. Since there is no evidence of a decrease in linking /r/ in the present dataset, perhaps Bauer's explanation is more fitting here.

4.4.4 Task effect

As shown in figure 4.9, there was a significant effect of task on linking /r/, This is interesting, as reading aloud often leads to higher /r/ production due to orthographic influence (Turton and Lennon 2023), but it appears that the careful speech style used by participants here led to an overall decrease in linking /r/. This has also been shown to be the case in British English (e.g., Allerton 2000; Brown 1988; Mompean and Gómez 2011). Though linking /r/ is not stigmatised in either variety, as mentioned above it has been suggested by Bauer (1984) to be suppressed in careful speech due to the stigmatisation of intrusive /r/.

4.4.5 R-liaison: summary

The overall rate of linking /r/ in the dataset, at 73%, is very comparable to the results found for contemporary NZE by Marsden (2017), as well as the rates found for 20th Century NZE by Hay and Sudbury (2005). However, there is no apparent-time decrease in linking /r/ found in the present study, which contrasts with Marsden's conclusion that linking /r/ is on the decrease in NZE, as well as the findings of research investigating linking /r/ usage in British English. The marginal difference in linking /r/ usage between male and female speakers in the dataset corroborates findings from the development of r-liaison in NZE, where men were shown to produce a higher frequency of linking /r/, although such a trend was not found by

Marsden in her recent study. In addition, linking /r/ was produced significantly less frequently in read speech compared to spontaneous speech, suggesting together with the gender effect that in more careful and prestigious registers, linking /r/ is dispreferred. It is not yet clear why this is the case, but the suppression of linking /r/ as a collateral effect of intrusive /r/'s stigmatisation is one possibility, as has previously been suggested. The glottalised variant of linking /r/ identified during transcription has received very little attention in previous studies of r-liaison, though as discussed above, it has been noted in read speech in Queen Elizabeth II's Christmas broadcasts and in an AusE corpus. The present study includes potentially the first identification of the variant in spontaneous speech, and puts the prevalence of the glottalised variant significantly above the previous estimates, with little understanding of how or when this variant arose in NZE. However, the use of both the glottalised variant and r-liaison as a whole appear relatively stable in the present study.

4.5 Rhoticity: results and discussion

4.5.1 Sporadic rhoticity in the dataset

Of the 37 participants in the study, 15 produced at least one token of post-vocalic /r/. Of these 15, ten produced fewer than five tokens, which were largely high-frequency function words such as *their*, *or*, or *are*. As noted in section 1.5.3, Trudgill and Gordon (2006) define English speakers as rhotic if they produce *any* frequency of non-initial pre-consonantal or pre-pausal /r/. By this definition of rhoticity, over 40% of speakers in the present study would be considered 'rhotic', as they produced at least one post-vocalic /r/ token in non-linking (i.e. not pre-vocalic) contexts. However, as discussed in section 1.5.3, particular words, such as 'Ireland' or the letter 'R', are commonly pronounced with post-vocalic /r/ in NZE (Bauer and Warren, 2004:594), so this would arguably make the entire variety rhotic by Trudgill and Gordon's definition. This is hardly a fair characterisation of NZE, not least because of the high variation in rhoticity levels across speakers in the present study – if all 15 of these speakers are 'rhotic', then the question arises as to how to describe the five speakers with much higher and more systematic non-linking post-vocalic /r/ production. For this reason, Trudgill and Gordon's definition of rhoticity will not be adopted in this discussion, and speakers producing fewer than five tokens will not be considered 'rhotic' during this discussion. Nevertheless, the presence of sporadic rhoticity among these speakers is nevertheless intriguing and still has implications for the status of rhoticity in NZE, suggesting that rhotic realisations are accessible to most speakers of the variety without a categorical ban on the phenomenon, as would be the case for SSBE, for example.

4.5.2 The five partially rhotic speakers

The five remaining speakers produced a mean of 26.4 post-vocalic /r/ tokens per speaker, with varying degrees of systematicity. Table 4.2 shows the number and context of tokens for these five speakers. The column NEAR includes items in both merged NEAR and SQUARE lexical sets.

Table 4.2 Post-vocalic /r/ tokens from five partially rhotic speakers

Speaker	Vowel context						Total tokens
	NURSE	lettER	NEAR	FORCE	START	other	
P12	28	8	2	3	3	1	45
P22	–	1	10	6	1	2	20
P28	2	14	5	5	8	3	37
P32	16	1	2	–	–	–	19
P33	–	1	3	7	–	–	11
Total	46	25	22	21	12	6	132

There was a large degree of inter-speaker variation, with most speakers producing post-vocalic /r/ variably across multiple contexts.

4.5.2.1 P12 and P32

These two speakers represent the emergence of NURSE-rhoticity that has been noted, among others, by Starks and Reffell (2005), Kennedy (2006), Gibson and Bell (2010), Marsden (2017), and Ross (2024). Table 4.3 shows the proportion of rhotacisation in relevant contexts from speakers P12 and P32.

Table 4.3 Rhoticity prevalence for speakers 12 and 32, by lexical set.

Speaker	% rhotic by lexical set				
	NURSE	lettER	NEAR	FORCE	START
P12	87.5	15.4	6.3	11.5	12.0
P32	100	1.8	1.6	–	–

P12 favoured the NURSE and lettER contexts, as well as a notable degree of rhoticity in NEAR, FORCE and START, but did not demonstrate categorical rhoticity aside from the near-categorical level of NURSE-rhoticity. P32 was the only participant with categorical rhoticity in any context, with /r/ present in all NURSE tokens, but had only sporadic rhoticity

in lettER and NEAR/SQUARE. In previous literature regarding NURSE-rhoticity, the variant is almost exclusively associated with New Zealand's Pasifika community, and is suggested to be a feature only used by younger speakers. Both P12 and P32 are in the younger age group, but whilst P12 described herself as having Samoan family, P32 described no such heritage, being from a New Zealand Chinese family. It is perhaps unsurprising that as NURSE-rhotacisation gains traction in the New Zealand Pasifika community and faces little or no apparent stigmatisation, that the variant is diffusing to other parts of the wider NZE speech community.

4.5.2.2 P22 and P28

These two speakers both displayed broad optional rhoticity, and neither favoured one vowel context particularly strongly. Table 4.4 shows the proportion of rhotacisation in relevant contexts from speakers P22 and P28.

Table 4.4 Rhoticity prevalence for speakers 22 and 28, by lexical set.

Speaker	% rhotic by lexical set				
	NURSE	lettER	NEAR	FORCE	START
P22	–	1.1	32.3	14.3	3.0
P28	7.7	29.8	14.3	15.2	50.0

P22 favoured NEAR and FORCE contexts, whilst P28 had post-vocalic /r/ present across all observed contexts, but with broad preference for lettER, NEAR, START and FORCE. Neither described any Pasifika heritage, and P22 is in her 40s, so neither speaker belongs to the young Pasifika demographic with developing NURSE-rhoticity. Interestingly, both reported a grandparental connection to Southland, the area of New Zealand with historic variable rhoticity (see section 1.3.1), but neither had ever lived in the area, and both had parents who were speakers of non-rhotic English varieties. Rhoticity in NZE has previously been reported to persist into adulthood in the children of parents who speak North American English (Starks and Bayard, 2002), but a direct grandparental influence in this way would be very surprising. Perhaps to these two speakers, rhotic NZE had a particularly prestigious and personal status, leading to sporadic rhoticity across a variable set of contexts.

4.5.2.3 P33

Table 4.5 shows the proportion of rhotacisation in different contexts from speaker P33.

Table 4.5 Rhoticity prevalence for speaker 33, by lexical set.

Speaker	% rhotic by lexical set				
	NURSE	lettER	NEAR	FORCE	START
P33	–	2.5	6.7	28.0	–

P33 is very much an outlier in social demographics for rhoticity, being in his 60s and of European descent. His rhotic tokens were largely from the FORCE lexical set, with 28% of total opportunities produced in rhotic manner. He also produced two tokens of rhotic NEAR/SQUARE in the word *there*, both in moments of emphasis. All of his spontaneous rhotic tokens were produced either phrase-finally, or in moments of hesitation, perhaps indicating that he employs prolonged rhoticity as a form of disfluency during spontaneous speech. There is no clear sociolinguistic motivation for P33's sporadic rhoticity, which though relatively frequent, is by no means categorical, and seems to be prosodically motivated.

4.5.3 NURSE-rhotacisation

The rhotacisation of NURSE in NZE is a relatively well-documented phenomenon: NURSE-rhoticity is retained in Southland English, a regional variety which is otherwise demonstrating a general decline in rhoticity (Bartlett 1992, 2002; Bayard 1990b), and NURSE is becoming rhotacised in some speakers in the North of the country, particularly those in the Pasifika community (Starks and Reffell 2005; Kennedy 2006; Gibson and Bell 2010; Marsden 2017; Ross 2024). Furthermore, as discussed above, two speakers in the current dataset showed frequent or categorical rhotic realisations of NURSE, and amongst the other semi-rhotic speakers, no other vowel was rhotacised to this level of consistency. In varieties of American English where rhoticity has historically been lost, rhoticity can be seen to 're-emerge' following increased contact with supra-regional standard varieties, as discussed in section 1.5.3. In these varieties, it has been clearly demonstrated that NURSE is subject to rhotacisation significantly more than any other lexical set, and it appears that the same relationship is present in NZE between NURSE and the other 'ex-rhotic' lexical sets of NEAR/SQUARE, START, CURE, NORTH/FORCE, and letter. However, in the studies of American dialects discussed in section 1.5.3, there is no explicit suggestion as to why the change should occur in NURSE first. However, NURSE is an outlier among the rhotic lexical

sets: the other ex-rhotic sets have become merged with non-etymologically rhotic equivalents, as shown in figure 4.10 below:

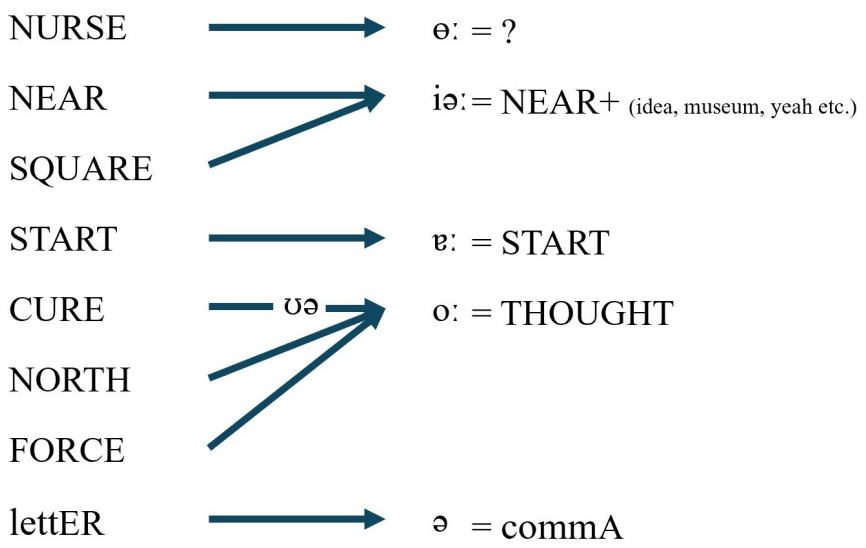


Fig. 4.10 Mergers of rhotic and non-rhotic lexical sets in NZE

For rhoticity to fully 're-establish' itself in NZE in the form that it took before the loss of rhotacisation in the variety, phonological splits would have to occur in seven of these eight lexical sets, distinguishing the vowels preceding etymological /r/ with existing non-rhotic phonemes. Whether this is in fact possible is beyond the scope of this thesis, but it seems that much more intense contact with fully rhotic speakers would be necessary, as has been the case in the American dialects discussed above. However, NURSE is unlike these lexical sets, in that all NURSE environments contain etymological /r/, and there is no non-rhotic equivalent. Additionally, NURSE in American English is syllabic, realised as [ɚ] and merged with lettER. This realisation is extremely similar to the realisation of NURSE by semi-rhotic NZE speakers, and this is possibly another reason for the environment being favoured: an 'r-ful' vowel is not as explicit a violation of phonological constraints as an /r/ that is unambiguously in the syllable coda. Therefore, NURSE is an outlier both etymologically and phonologically in ways that encourage this environment as a receiver for rhotacism.

There is potentially another more NZE-specific explanation for the favouring of NURSE contexts for rhoticity, and that is the rounding of canonical NURSE in non-rhotic NZE, realised as [ɵː]. As Warren (2018) notes, this has resulted in a significant overlap in acoustic space with GOOSE, also a high front rounded vowel. NURSE-rounding is realised acoustically as,

partly, a significantly lowered F3 formant frequency (Warren 2018:318), which incidentally is also an acoustic correlation of rhoticity in many varieties, including NZE (Hay and Maclagan 2012). The perceptual confusion of rounding and rhoticity can be seen in the spelling of AusE GOAT as -aur by American English speakers, seen in orthography such as "aur naur" or "or nor" for *oh no*[1], as well as the propensity for American children with speech sound disorders to acquire /r/ as some kind of rounded vowel or semivowel /w/ (Chung et al. 2019). Therefore, it is also possible that the highly rounded quality of NURSE in NZE is contributing to the ease with which rhoticity is entering this lexical set.

4.5.4 Orthographic effect

An over-representative proportion of rhotic tokens in the study were from the reading task: 20% of total instances were from the read sentences, despite the read task only representing 14% of the dataset's duration. Rhoticity in speech can be encouraged by reading from words spelled with their etymological /r/, as has been shown in Lancashire English (Turton and Lennon 2023), and potentially also in NZE (Starks and Reffell 2005; discussed in section 1.5.3). All instances of rhoticity following MOUTH and CURE were from the wordlist items 'say *our* please' and 'say *tour* please', suggesting that particularly in the case of *our*, the citation form for many speakers includes a coda /r/. This is perhaps similar to how many New Zealanders pronounce the letter 'R' as [ɐːɹ], as discussed above, with coda /r/ being perceived as aiding clarity, whether or not it is typically present in the participant's spontaneous speech. A further four read tokens, three of which were from the same participant, used rhotic lettER in the *villagers* subset of words (e.g. *pagers*, *managers*), presumably as a form of distinction from the *villages* subset in the list (e.g. *pages*, *manages*), though care was taken to avoid minimal pairs appearing on the same page during the task. However, all speakers in the present study who produced rhotic tokens in the reading task also produced tokens in the picture description task, so this rhoticity cannot have been solely the result of orthographic influence. This suggests that that in studies such as Starks and Reffel (2005) where participants produced rhotic tokens in read data, these participants likely also use rhoticity in their conversational speech.

4.5.5 Rhoticity in New Zealand English: summary

The results from the present study generally support Marsden's hypothesis that NZE is not easily defined as 'non-rhotic' in the sense of either Trudgill and Gordon (2006), or Harris

[1]This is a popular meme that appears to originate here: https://www.youtube.com/watch?v=z1bOcxkiRbQ – see the blog post by Will Chapman for a phonetic discussion (Chapman 2024).

(2013), due to the sporadic realisation of /r/ in post-vocalic, non-linking contexts by speakers across many social strata and styles. In this small participant group of 37, over 40% of speakers appear to have the option of producing rhotic variants in everyday spontaneous speech. While this rate is lower than that found by Marsden (2017), who found 72% of speakers producing some level of rhoticity, it still represents a sizeable minority that is surprising in the context of the variety's prototypical description as 'non-rhotic' (for example, in Bauer and colleagues' 2007 IPA illustration). Five of the speakers in the present study show a significant degree of rhoticity in their speech, and could be reasonably described as partially or semi-rhotic. Two of these speakers represent the more historically established and linguistically conservative rhotic variety from the south of the country, but the level of rhoticity in their speech is surprisingly high considering that they have never lived in the region and their parents are (reportedly) also non-rhotic. Two further speakers appear to have acquired the innovative NURSE-rhoticity that has been identified in the Pasifika community further north of Wellington, suggesting that the variant's geographic and social distribution is expanding. NURSE-rhotacisation in regional American Englishes has been shown to lead a general increase in rhoticity during dialect contact with General American English, but it is uncertain whether NURSE-rhoticity will continue to diffuse through NZE, and whether other vowels will follow suit. As discussed above, NURSE presents a particularly likely linguistic context for rhotacisation in NZE, whereas other lexical sets containing etymological /r/ are fully merged to other non-rhotic sets and so present a challenge for the acquisition of rhoticity. The broad picture that emerges from the present study is one of a varietal and individual 'openness' to rhotic realisations, in a way that is atypical of other non-rhotic varieties such as AusE or SSBE, and it remains to be seen whether this translates to a partially rhotic standard NZE in the future.

Chapter 5

Conclusions

5.1 Monophthongs

Returning to section 1.6, the following research questions were proposed:

1.1 Are short front vowel changes such as TRAP- and DRESS-lowering occurring in younger Wellington speakers, and what does this reveal about the progression of short front vowel lowering through New Zealand?

1.2 Can an investigation of START and STRUT in Wellington reconcile the conflict between findings of STRUT-fronting in Auckland and Nelson, and potential STRUT- and START-retraction in Christchurch?

1.3 Does 21st Century Wellington English behave comparably to other recent findings elsewhere in New Zealand? For example, does it exhibit NURSE-lowering, FOOT-fronting, and stability in other monophthongs?

5.1.1 Short front vowels

TRAP-lowering is clearly occurring in Wellington, as has also been shown in Auckland. This suggests that short front vowel lowering is not a regional innovation of Auckland, but rather a change diffusing throughout NZE. This strengthens the conclusion by Ross (2024) that Nelson may also be beginning to demonstrate TRAP-lowering, given the marginal difference in TRAP height between age groups. The visual data from Hurring and Clark (2025) and the GAMM analysis from Hurring et al. 2025) conflict as to whether the movement of TRAP has reversed or merely plateaued, but the more conservative interpretation from Hurring et al. (2025) still suggests that TRAP has stopped raising in Christchurch.

It seems likely that Auckland is leading short front vowel lowering in NZE, as DRESS-lowering is not present to any degree in the Wellington speakers, or demonstrably present elsewhere in New Zealand. However, there is also no sign of DRESS-*raising* in the present study, suggesting that DRESS-raising in Wellington has completely plateaued. This contrasts with the modelling from Hurring et al. (2025), where DRESS is shown to still be raising in the youngest speakers from the QuakeBox corpus. This set of contrasting findings for DRESS could support an 'Auckland-outwards' path of diffusion for short front vowel lowering, since DRESS is lowering in Auckland, plateauing in Wellington, and raising in Christchurch. Figure 5.1 below shows the movements of the short front vowels in Auckland, Wellington, Nelson, and Christchurch.

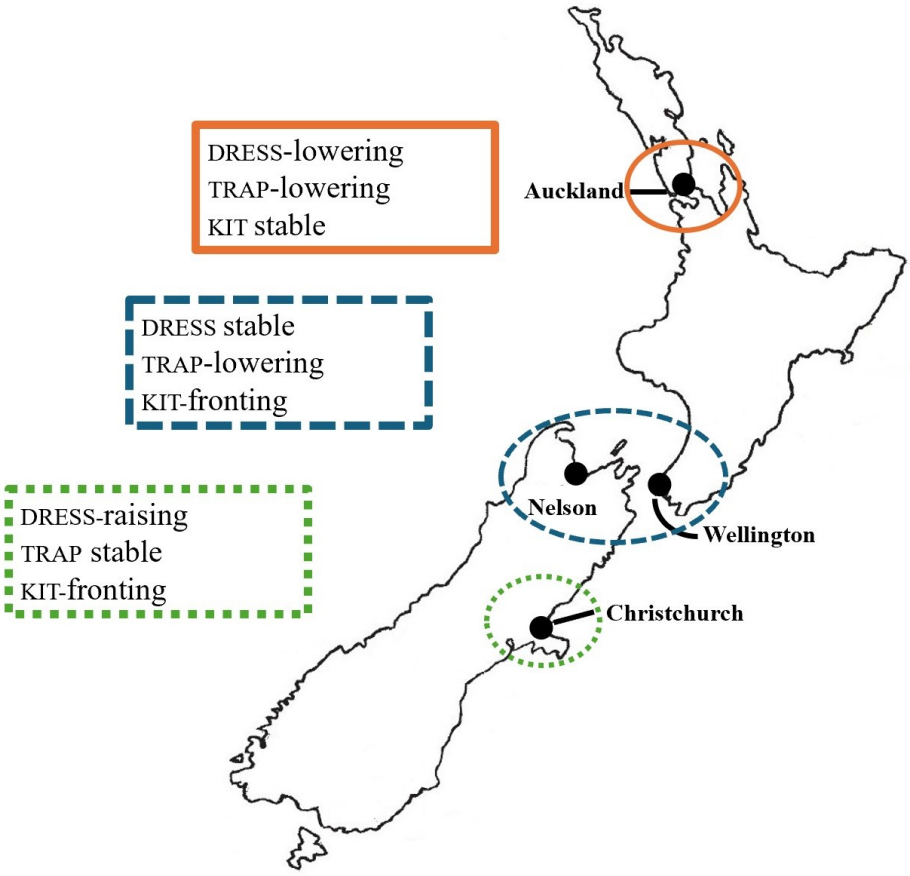


Fig. 5.1 Movements of the short front vowels in different New Zealand cities

KIT presents a problem for the Auckland-outwards diffusion model, however. In the present study, KIT was tentatively found to be more raised and fronted by younger speakers, a finding also reported in Christchurch by Hurring et al. (2025). Ross (2024) finds no such change in Auckland, but reports KIT-fronting in Nelson, concluding that this is more

likely to be a shift along the broad-general spectrum than a sound change to general NZE. However, the presence of KIT-fronting and raising everywhere outside of Auckland is as of yet unaccounted for. Another possible interpretation, that would preserve an Auckland-as-leader model, is that KIT was already fronted and raised in Ross's older Auckland group, but this is not testable in the present study. It is unlikely to be a part of a 'short front vowel shift reversal', as presently the places demonstrating KIT-raising are not showing signs of DRESS-lowering.

5.1.2 START and STRUT

Previous findings for START and STRUT in Canterbury conflict with findings in Auckland and Nelson. The present study demonstrates that this is due to START-retraction, which is occurring in Christchurch and, most likely, Wellington. When using the Auckland normalisation method on data from the present study, it was possible to reproduce this conflict by using the two normalisation methods on the same dataset. Therefore it is also likely that START-retraction is also occurring in Auckland and Nelson, and that STRUT is not fronting in NZE. If START is implicated in the short front vowel shift (see section 1.4.1), then the finding of START-retraction in all four cities is significant, as it may preclude TRAP-lowering in a vowel shift 'reversal' scenario, as has potentially been the case in AusE (Cox et al., 2024).

5.1.3 Other monophthongs

NURSE-lowering, found in all recent investigations of NZE, was also found in the present study. However, this was only found to be the case for younger female speakers, whose NURSE vowels were lower than their male counterparts. This reverses the trend in previous generations of speakers, where female speakers consistently produced higher NURSE realisations. There has not been any gender effect for NURSE-lowering demonstrated elsewhere in New Zealand, and therefore it is difficult to account for this finding. However, as NURSE-raising was subject to notable gender stratification, it is not an entirely surprising finding either. Future investigation is needed to see whether NURSE begins to lower for male speakers in Wellington, or whether NURSE-lowering elsewhere progresses in a gendered manner.

FOOT-fronting is present in Wellington, having only previously been shown in Auckland. As FOOT has not recently been investigated elsewhere, it remains to be seen whether this is occurring throughout New Zealand. The conditioning of the change is also yet to be fully

accounted for, and any investigation would require a large dataset due to the low frequency and restricted lexical environments for FOOT.

LOT, FLEECE, GOOSE and THOUGHT are all relatively stable in the present study. This is unsurprising and broadly consistent with current literature, although changes to FLEECE, GOOSE and THOUGHT are suggested by Hurring et al. (2025) to be occurring in Christchurch. No investigation of dynamic properties were undertaken in the present study, but would be valuable in future research, due to the changes to FLEECE- and GOOSE-diphthongisation in Auckland and Nelson shown by Ross (2024).

5.2 L-vocalisation

For l-vocalisation, the research questions in section 1.6 were as follows:

2.1 Are rates of l-vocalisation still increasing in Wellington?

2.2 Does l-vocalisation in Wellington demonstrate gendered or stylistic variation?

2.3 How does l-vocalisation interact with syllable position and phonetic environment in Wellington?

Contrasting with all previous findings for NZE, it appears that l-vocalisation is no longer increasing in Wellington. There is a strong effect of age on l-vocalisation, with the youngest group producing /l/ as vocalised less than their older counterparts. There is a gap of almost 30 years between the present study and the most recent apparent-time study l-vocalisation in New Zealand: Horvath and Horvath use data from 1996-1997 in their research. Therefore, the apparent reversal of l-vocalisation's progress through NZE merits further investigation. It also lacks a satisfactory explanation at this early stage, though changes in prestige status may present a partial explanation.

L-vocalisation was also found in the present study to show a consistent gender effect, with women more likely to vocalise /l/ in all three age groups. This is once again a new finding for NZE, though was putatively suggested by Horvath and Horvath (2001). There was also a gender effect found for the decrease in l-vocalisation across age groups, with younger men producing vocalised /l/ far less than young women. This is also indicative of a potential prestige status for vocalised /l/ in NZE. The lack of stylistic variation in the present study also suggests that l-vocalisation is not a stigmatised feature of NZE.

The findings for phonetic environment were broadly consistent with the findings from Horvath and Horvath (2001). For preceding consonant, labial environments were preferred and coronal environments dispreferred. For following environment, consonants and pauses were similarly preferred, and vocalisation before vowels was less common but still present. Findings for syllable position also echoed Horvath and Horvath's findings, demonstrating less vocalisation in coda contexts, but the present study's findings may represent a further progression of the change, with cluster contexts preferred above syllabic contexts. However, cluster contexts have also seen the sharpest decrease in vocalisation, potentially due to the prescriptive rhetoric around l-vocalisation in New Zealand focussing on vocalisation in clusters.

The findings for l-vocalisation in the present study demonstrate a potential reversal of the change's progression in younger speakers, and also show that l-vocalisation is subject to more social variation than previously assumed. However, the phonetic conditioning of the change appears to be more stable and provides a point of continuity between previous research and present findings. It would be valuable to investigate other locations in New Zealand, to see whether this apparent reversal is present elsewhere in the variety.

5.3 R-liaison

The following research questions were posed for r-liaison in section 1.6:

3.1 Are rates of linking /r/ changing in Wellington?

3.2 Does linking /r/ usage in Wellington demonstrate with gendered or stylistic variation?

The present findings do not indicate any change in use of linking /r/ in Wellington. This contrasts with findings from Marsden (2017), who suggests a decrease in younger speakers. As r-liaison is suggested by Kennedy (2006) to be subject to a degree of regional variation in New Zealand, this provides a potential explanation for this conflict in findings, as Marsden did not investigate speakers from Wellington. Another possible explanation is the under-representation of Māori participants in the present study, contrasting the high level of representation in Marsden's dataset. As a whole, the present study suggests that r-liaison in NZE is fairly stable, and the overall rate is comparable to the older speaker groups in Marsden's study.

Usage of r-linking was not found to be significantly correlated with gender in the present study, although the null finding was slightly above the significance threshold. There was a significant effect of task, however, with linking /r/ being produced less in the reading task. This corroborates findings of a style effect in other English varieties, which are generally explained as resulting from the stigmatisation of intrusive /r/ and resulting suppression of all r-liaison strategies.

The phenomenon of glottalised linking /r/ was not anticipated in the research questions, but was immediately salient during the transcription process. This phenomenon has been noted in read speech from RP and AusE, but not in spontaneous speech, and the rates in the present study are higher than previous estimates for these two varieties. A diachronic study of the phenomenon in NZE would shed light on this variant's origins and trajectory. Investigating prosodic conditioning of r-liaison was beyond the scope of the present study, but would be valuable in future.

5.4 Rhoticity

The research questions for rhoticity in section 1.6 were as follows:

4.1 Do any speakers in Wellington demonstrate rhoticity that conflicts with New Zealand English's description of "non-rhotic"?

4.2 If so, how do they compare to rhotic speakers in the far north and south?

A high proportion (40.5%) of speakers in the present study produced at least one instance of rhoticity. In one sense, this is surprising, given NZE's status as non-rhotic in the dialectological canon. However, it supports the findings of multiple studies from the past two decades that show an increase in NURSE-rhoticity from New Zealanders, particularly Pasifika New Zealanders in the North Island. However, this phenomenon has not previously been investigated as far south as Wellington.

Five of the 37 participants (13.5%) had rhoticity above sporadic levels. Two of these five showed near-categorical NURSE-rhoticity, as has been well documented before, but only one of these speakers was from a Pasifika background, suggesting that NURSE-rhotacisation may be diffusing outwards into other linguistic networks in New Zealand. The remaining three participants were highly diverse in their use of rhoticity, and did not demonstrate any categorical rhotacisation. Two had extended family connections to historically-rhotic

Southland, and the remaining participant had no clear motivation other than the consistent placement of his rhoticity at moments of disfluency.

The high degree of variation in rhoticity in the present study's small participant group was unexpected and is indicative of a high degree of variation in the wider speech community. Given the tendency for particular lexical items in NZE to contain post-vocalic /r/, even for otherwise non-rhotic speakers, it could be argued that NZE never fully became non-rhotic, and that this has allowed for a small resurgence of rhoticity as the variety's global influences shift away from British English and towards both American and a diverse array of L2 Englishes. NURSE-rhotacisation appears to be rapidly increasing, with some speakers now having categorical rhoticity in the NURSE lexical set. NURSE is cross-dialectally the best candidate for re-rhotacisation, and this is likely due to its lack of merger with non-rhotic phonemes. The findings of the present study suggest that further investigations of NURSE-rhoticity in NZE should not necessarily be limited to the Pasifika community.

5.5 Limitations

In further research, the potential issues of accommodation discussed in section 2.7 could be minimised by making sure that data collection is undertaken by a speaker of NZE, or by collecting spontaneous data from pairs of NZE speakers who are familiar with one another. Additionally, including lexical item and prosodic placement as factors during the analyses of r-liaison and l-vocalisation would be desirable, to allow for the variables of frequency and syllabic stress, which are known to affect r-liaison and l-vocalisation in multiple varieties of English. Information about participants' social class was not collected, and the participant group was likely skewed towards middle class speakers due to the recruitment process, as discussed briefly in section 3.1.1.

L-vocalisation is not an inherently categorical phenomenon, and although many /l/ tokens were clearly perceptually 'vocalised' or 'unvocalised', the process of vocalisation follows a continuous cline in articulatory terms (Szalay et al. 2022). Any coding of l-vocalisation on an auditory basis necessitates a degree of subjective judgement, and additionally the /l/ tokens coded as 'vocalised' in the present study may not be fully vocalised with regard to articulation. Though analysis in this case was internally consistent, in future a more repeatable

and methodical system[1] for auditory analysis of l-vocalisation should be developed, so that figures are more directly comparable across researchers.

The small number of partially rhotic speakers in the present study meant that statistical analysis was not possible beyond descriptive token counts. Since the five partially rhotic participants in the present study were so varied in their rhoticity, it may be that rhoticity is entering Wellington English through multiple routes of diffusion, but this is beyond the scope of the present study. A larger study of partially rhotic speakers from Wellington would also allow for further investigation of the linguistic and social distribution of rhoticity within the Wellington speech community.

5.6 What is next for New Zealand English?

As a nation, New Zealand has changed significantly since the late 20th Century, with a deliberate and careful move away from western-centric immigration policy and an increased awareness and appreciation of cultural and linguistic diversity (see section 1.1.1, and discussion in Smits 2019). In particular, Auckland has seen a particularly sizeable shift in demography, rapidly becoming one of the planet's most diverse cities, and speakers in Auckland appear to be linguistically innovative with respect to vowel changes and emergent rhoticity.

The present study shows that Wellington, too, is undergoing many of the changes that appear to be originating in Auckland, as well as previously undocumented changes in l-vocalisation. Reversal of the short front vowel shift and NURSE-raising, together with apparent reversal of l-vocalisation and a resurgence of rhoticity, all diverge from the canonical understanding of 20th Century NZE as a newly-formed colonial dialect. As a smaller and less diverse city than Auckland, Wellington presents a case for the movement of NZE as a whole along a new trajectory. Having canonically been described as a product of the English varieties present in the 19th Century, New Zealand English in the modern day may be entering a second major period of dialect and language contact, resulting in new directions of change.

[1] for example, a system of parameters such as ($\pm$*rounded*), ($\pm$*formant transition between vowels*), ($\pm$*audible lateral articulation*).

Bibliography

Abell, M. (1980). A study of sociolinguistic stereotyping by fourth form students in Christchurch. Master's thesis, University of Canterbury, Christchurch, New Zealand.

Ainsworth, H. (2004). *Regional Variation in New Zealand English: The Taranaki Sing-song Accent*. Phd Thesis, Victoria University of Wellington, Wellington.

Akaike, H. (1974). A new look at the statistical model identification. *IEEE Transactions on Automatic Control*, 19(6):716–723.

Allerton, D. J. (2000). Articulatory inertia vs 'Systemzwang': changes in liaison phenomena in recent British English. *English Studies*, 81(6):574–581.

Angle, J. and Hesse-Biber, S. (1981). Gender and prestige preference in language. *Sex Roles*, 7(4):449–461.

Arnold, R. (1981). *The Farthest Promised Land: English villagers, New Zealand immigrants of the 1870s*. Victoria University Press, Wellington.

Bartlett, C. (1992). Regional variation in New Zealand English: The case of Southland. *New Zealand English Newsletter*, 6:5–15.

Bartlett, C. (2002). *The Southland Variety of New Zealand English: Postvocalic /r/ and the BATH vowel*. PhD thesis, University of Otago, Dunedin.

Bates, D., Mächler, M., Bolker, B., and Walker, S. (2015). Fitting Linear Mixed-Effects Models Using lme4. *Journal of Statistical Software*, 67(1):1–48.

Bauer, L. (1984). Linking /r/ in RP: Some facts. *Journal of the International Phonetic Association*, 14(2):74–79.

Bauer, L. (1986). Notes on New Zealand English phonetics and phonology. *English World-Wide*, 7(2):225–258.

Bauer, L. (1994). English in New Zealand. In Burchfield, R., editor, *The Cambridge History of the English Language. Volume 5: English in Britain and Overseas: Origins and Development*, pages 382–429. Cambridge University Press, Cambridge.

Bauer, L. and Bauer, W. (2002). Can we watch regional dialects developing in colonial English? The case of New Zealand. *English World-Wide*, 23(2):169–193.

Bauer, L. and Warren, P. (2004). New Zealand English: Phonology. In Kortmann, B. and Schneider, E. W., editors, *A Handbook of Varieties of English: A Multimedia Reference Tool. Volume 1: Phonology. Volume 2: Morphology and Syntax*, pages 580–602. De Gruyter Mouton, Berlin.

Bauer, L., Warren, P., Bardsley, D., Kennedy, M., and Major, G. (2007). New Zealand English. *Journal of the International Phonetic Association*, 37(1):97–102.

Bayard, D. (1990a). 'God help us if we all sound like this'. Attitudes to New Zealand and other English accents. In Bell, A. and Holmes, J., editors, *New Zealand Ways of Speaking English*, pages 67–96. Multilingual Matters, Clevedon, New Zealand.

Bayard, D. (1990b). Minder, Mork and Mindy? (-t) glottalisation and post-vocalic (-r) in younger New Zealand English speakers. In Bell, A. and Holmes, J., editors, *New Zealand Ways of Speaking English*, pages 149–164. Multilingual Matters, Clevedon, New Zealand.

Bayard, D. (1991). Antipodean accents and the "cultural cringe": New Zealand and American attitudes towards NZE and other English accents. *Te Reo*, 34:15–52.

Becker, K. (2014). (r) we there yet? The change to rhoticity in New York City English. *Language Variation and Change*, 26:141–168.

Bell, A. (2000). Maori and Pakeha English: a case study. In Bell, A. and Kuiper, K., editors, *New Zealand English*, pages 221–248. John Benjamins.

Blackwood, M. (2022). Kiwi Kindergarteners: Exploring kindergarteners' vowel change in New Zealand English over six months. Master's thesis, University of Canterbury, Christchurch, New Zealand.

Boberg, C. (2005). The Canadian shift in Montreal. *Language Variation and Change*, 17(2):133–154.

Boersma, P. and Weenink, D. (2025). Praat: doing phonetics by computer. http://www.praat.org/.

Borowsky, T. and Horvath, B. M. (1997). L-vocalisation in Australian English. In Hinskens, F., van Hout, R., and Wetzels, W. L., editors, *Variation, Change, and Phonological Theory*. John Benjamins.

Brand, J., Hay, J., Clark, L., Watson, K., and Sóskuthy, M. (2021). Systematic co-variation of monophthongs across speakers of New Zealand English. *Journal of Phonetics*, 88:101096.

Braunias, S. (2020). Our lockdown life : A whanau of 5 million. *Herald on Sunday (Auckland, N.Z.),*, 14 Jun 2020; n.817:su.

Brown, A. (1988). Linking, intrusive, and rhotic /r/ in pronunciation models. *Journal of the International Phonetic Association*, 18(2):144–151.

Bybee, J. (2001). *Phonology and Language Use*. Cambridge University Press, Cambridge.

Chapman, W. (2024). The origin of -aur memeing. https://wills-corner.com/aur-memeing.

Chevalier, A. (2016). *Globalisation versus Internal Development: The reverse short front vowel shift in South African English*. PhD thesis, Cape Town, University of Cape Town.

Chung, H., Farr, K., and Pollock, K. E. (2019). Rhotic vowel accuracy and error patterns in young children with and without Speech Sound Disorders. *Journal of Communication Disorders*, 80:18–34.

Clarke, S., Elms, F., and Youssef, A. (1995). The third dialect of English: Some Canadian evidence. *Language Variation and Change*, 7:209–228.

Cole, A. (2022). Cockney moved East: The dialect of the first generation of East Londoners raised Essex. *Dialectologia et Geolinguistica*, 30:91–114.

Cox, F. (1996). Vowel change in Australian English. *Phonetica*, 56:1–27.

Cox, F. and Palethorpe, S. (2008). Reversal of Short Front Vowel Raising in Australian English. In Fletcher, J., Loakes, D., Roland, G., Burnham, D., and Wagner, M., editors, *Proceedings of Interspeech 2008 incorporating SST 2008*, pages 347–350. ISCA, Bonn, Switzerland.

Cox, F. and Palethorpe, S. (2019). Vowel variation across four major Australian cities. In Calhoun, S., Escudero, P., Tabain, M., and Warren, P., editors, *Proceedings of the International Congress of Phonetic Sciences 2019*, pages 577–581, Canberra, Australia. Australasian Speech Science and Technology Association Inc.

Cox, F., Palethorpe, S., Buckley, L., and Bentink, S. (2014). Hiatus resolution and linking 'r' in Australian English. *Journal of the International Phonetic Association*, 44(2):155–178.

Cox, F., Penney, J., and Palethorpe, S. (2024). Australian English monophthong change across 50 years: static versus dynamic measures. *Languages*, 9(3):99.

Docker, J. and Fischer, G. (2000). *Race, Colour and Identity in Australia and New Zealand*. University of New South Wales Press, Sydney.

Easton, A. and Bauer, L. (2000). An Acoustic Study of the Vowels of New Zealand English. *The Australian Journal of Linguistics*, 20(2):93–117.

Eckert, P. (2008). Where do ethnolects stop? *International Journal of Bilingualism*, 12(1-2):25–42.

Eichhorn, J., Kent, R., Austin, D., and Vorperian, H. (2017). Effects of aging on vocal fundamental frequency and vowel formants in men and women. *Journal of Voice*, 32(5):644.e1–644.e9.

Ellingsæter, C. (2014). 'I sound so posh compared to you lot': Phonological variation and change in the Surrey accent. Master's thesis, University of Bergen, Bergen.

Feagin, C. (1990). The dynamics of a sound change in southern states english: From r-less to r-ful in three generations. In Edmondson, J. A., Feagin, C., and Muelhaeusler, P., editors, *Development and Diversity: Linguistic variation across time and space*, page 129–146. Summer Institute of Linguistics/The University of Texas at Arlington, Dallas, Texas.

Fidelholtz, J. (1975). Word frequency and vowel reduction in English. In *Papers from the 11th Annual Regional Meeting of the Chicago Linguistic Society*, pages 200–213. Chicago Linguistic Society.

Foulkes, P. (1997). English [r]-sandhi - a sociolinguistic perspective. *Histoire Epistémologie Langage*, 19(1):73–96.

Gibson, A. (2005). Non-prevocalic /r/ in New Zealand Hip-Hop. *New Zealand English Journal*, 19:5–12.

Gibson, A. and Bell, A. (2010). Performing Pasifika English in New Zealand: the case of bro'town. *English World-Wide*, 31(3):231–251.

Gordon, E. (1997a). Sex, speech and sterotypes: Why women use prestige forms more than men. *Language in Society*, 26:47–63.

Gordon, E. (1998). The origins of New Zealand speech: The limits of recovering historical information from written records. *English World-Wide*, 19:61–85.

Gordon, E. and Abell, M. (1990). 'This objectionable colonial dialect': Historical and contemporary attitudes to New Zealand speech. In Bell, A. and Holmes, J., editors, *New Zealand Ways of Speaking English*. Multilingual Matters, Clevedon, New Zealand.

Gordon, E., Campbell, L., Hay, J., Maclagan, M., Sudbury, A., and Trudgill, P. (2004). *New Zealand English: Its Origins and Evolution*. Cambridge University Press, Cambridge.

Gordon, E. and Maclagan, M. (1989). Beer and Bear, Cheer and Chair: A longitudinal study of the EAR/AIR contrast in New Zealand English. *Australian Journal of Linguistics*, 9:203–220.

Gordon, E. and Maclagan, M. (2001). Capturing a sound change: A real time study over 15 years of the near/square diphthong merger in New Zealand English. *Australian Journal of Linguistics*, 21(2):215–238.

Gordon, E. and Maclagan, M. (2008). Regional and social differences in New Zealand: phonology. In Burridge, K. and Kortmann, B., editors, *Varieties of English 3*, pages 64–76. Mouton de Gruyter, Berlin.

Gordon, E. and Sudbury, A. (2002). The history of Southern Hemisphere Englishes. In Watts, R. and Trudgill, P., editors, *Alternative Histories of English*, pages 67–86. Routledge, London.

Gordon, P. (1997b). What New Zealanders believe about regional variation in New Zealand English: A folklinguistic investigation. *New Zealand English Journal*, 11:14–25.

Harrington, J., Palethorpe, S., and Watson, C. (2000). Monophthongal vowel changes in Received Pronunciation: An acoustic analysis of the Queen's Christmas broadcasts. *Journal of the International Phonetic Association*, 30:63–78.

Harrington, J., Palethorpe, S., and Watson, C. (2007). Age-related changes in fundamental frequency and formants: A longitudinal study of four speakers. In *8th Annual Conference of the International Speech Communication Association*, pages 2753–2756, Antwerp, Belgium.

Harris, J. (2013). Wide-domain r-effects in English. *Journal of Linguistics*, 49(2):329–365.

Hawkins, S. and Midgley, J. (2005). Formant frequencies of RP monophthongs in four age groups of speakers. *Journal of the International Phonetic Association*, 35(2):183–199.

Hay, J. and Maclagan, M. (2012). /r/-sandhi in early 20th Century New Zealand English. *Linguistics*, 50(4):745–763.

Hay, J., Maclagan, M., and Gordon, E. (2008). *New Zealand English*. Edinburgh University Press, Edinburgh.

Hay, J. and Sudbury, A. (2005). How rhoticity became /r/-sandhi. *Language*, 81(4):799–823.

Hickey, R. (2003). What's cool in Irish English? Linguistic change in contemporary Ireland. In Tristram, H. L. C., editor, *The Celtic Englishes III*, pages 357–373. Winter, Heidelberg.

Hickey, R. (2016). English in Ireland: Development and varieties. In Hickey, R., editor, *Sociolinguistics in Ireland*, pages 3–40. Palgrave Macmillan, Basingstoke.

Hickey, R. (2018). 'Yes, that's the best'. Short Front Vowel Lowering in English today. *English Today*, 34(2):9–16.

Holmes, J. and Bell, A. (1992). On shear markets and sharing sheep: The merger of EAR and AIR diphthongs in New Zealand English. *Language Variation and Change*, 4(3):251–273.

Holmes-Elliott, S. and Smith, J. (2018). Dressing down up north: DRESS-lowering and /l/-allophony in a Scottish dialect. *Language Variation and Change*, 30(1):23–50.

Horvath, B. M. and Horvath, R. J. (1997). The geolinguistics of a sound change in progress: /l/ vocalisation in Australia. In Meyerhoff, M., Boberg, C., and Strassel, S., editors, *Working Papers in Linguistics: A Selection of Papers from NWAVE 25*, pages 105–124. University of Philadelphia Press, Philadelphia, PA.

Horvath, B. M. and Horvath, R. J. (2001). A multilocality study of a sound change in progress: The case of /l/ vocalisation in New Zealand and Australian English. *Language Variation and Change*, 13:37–57.

Horvath, B. M. and Horvath, R. J. (2002). The geolinguistics of /l/ vocalisation in Australia and New Zealand. *Journal of Sociolinguistics*, 6(3):319–346.

Hughes, A., Trudgill, P., and Watt, D. (2012). *English accents & dialects: an introduction to social and regional varieties of English in the British Isles*. The English Language Series. Routledge, London, 5 edition.

Hurring, G. and Clark, L. (2025). Vowel variation in a segregated and isolated religious community. *English World-Wide*, 46:52–92.

Hurring, G., Wilson Black, J., Hay, J., and Clark, L. (2025). How stable are patterns of covariation across time? *Language Variation and Change*, First View:1–15.

Irwin, P. and Nagy, N. (2007). Bostonians /r/ speaking: a quantitative look at (R) in Boston. *University of Pennsylvania Working Papers in Linguistics:*, 13(2):135–147.

Johnson, W. and Britain, D. (2007). L-vocalisation as a natural phenomenon: Explorations in sociophonology. *Language Sciences*, 29(2-3):294–315.

Kemper, S., Vandeputte, D., Rice, K., Cheung, H., and Gubarchuk, J. (1995). Speech adjustments to aging during a referential communication task. *Journal of Language and Social Psychology*, 14(1-2):40–59.

Kennedy, M. (2006). Variation in the pronunciation of English by New Zealand school children. Master's thesis, Victoria University of Wellington, Wellington.

Kretzschmar, W. A. (2004). Standard American English pronunciation. In Kortmann, B. and Schneider, E. W., editors, *A Handbook of Varieties of English*, page 257–269. De Gruyter.

Labov, W. (1966). *The Social Stratification of (r) in New York City Department Stores*. Washington: Center for Applied Linguistics.

Labov, W. (1972). *Sociolinguistic Patterns*. University of Pennsylvania Press.

Labov, W. (1990). The intersection of sex and social class in the course of linguistic change. *Language Variation and Change*, 2:205–254.

Labov, W. (1994). *Principles of Linguistic Change*. Blackwell, Oxford.

Lass, R. (2000). Phonology and morphology. In *The Cambridge History of the English Language*, volume 3: 1476-1776, pages 56–186. Cambridge University Press.

Lee, J. J. and Guadagno, L. (2015). *World Migration Report 2015*. International Organization for Migration.

Linville, S. E. and Rens, J. (2001). Vocal tract resonance analysis of aging voice using long-term average spectra. *Journal of Voice*, 15(3):323–330.

Lobanov, B. M. (1971). Classification of Russian vowels spoken by different speakers. *Journal of the Acoustical Society of America*, 49:606–608.

Macalister, J. (2006). The Maori presence in the New Zealand English lexicon, 1850-2000. *English World-Wide*, 27(1):1–24.

Maclagan, M. and Gordon, E. (1996). Out of the AIR and into the EAR: Another view of the New Zealand diphthong merger. *Language Variation and Change*, 8(1):125–147.

Maclagan, M. and Gordon, E. (1999). Data for New Zealand English social dialectology: The Canterbury Corpus. *New Zealand English Journal*, 13:50–58.

Maclagan, M., Gordon, E., and Lewis, G. (1999). Women and sound change: Conservative and innovative behaviour by the same speakers. *Language Variation and Change*, 11:19–41.

Maclagan, M. and Hay, J. (2004). The rise and rise of New Zealand English DRESS. In *Proceedings of the 10th Australian International Conference on Speech Science & Technology*, pages 183–188, Macquarie University, Sydney. Australian Speech Science and Technology Association Inc.

Maclagan, M. and Hay, J. (2007). Getting fed up with our feet: Contrast maintenance and the New Zealand English "short" front vowel shift. *Language Variation and Change*, 19:1–25.

Maclagan, M., Watson, C., Harlow, R., King, J., and Keegan, P. (2017). Investigating the Sound Change in the New Zealand English Nurse Vowel / ɜː/. *Australian Journal of Linguistics*, 37(4):465–485.

Marsden, S. (2017). Are New Zealanders "rhotic"? The dynamics of rhoticity in New Zealand's small towns. *English World-Wide*, 38(3):275–304.

Marshall, E. J., Stuart-Smith, J., Butt, J., and Dean, T. (2024). Variation and change over time in British choral singing (1925-2019). *Laboratory Phonology*, 15(1):1–39.

Mattingley, W., Hay, J., Todd, S., Panther, F., King, J., and Keegan, P. J. (2024). Ongoing exposure to an ambient language continues to build implicit knowledge across the lifespan. *Linguistics Vanguard*, 10(1).

McDougall, K. and Jones, M. J. (2011). Liquid polarisation in australian english. In Lee, W.-S. and Zee, E., editors, *Proceedings of the 17th International Congress of Phonetic Sciences*, page 1358–1361, Hong Kong. City University of Hong Kong.

McKenzie, J. (2005). "But he's not supposed to see me in my weeding dress!"- The relationship between DRESS and FLEECE in modern New Zealand English. *New Zealand English Journal*, 19:13–25.

Mein Smith, P. (2011). *A Concise History of New Zealand*. Cambridge University Press, second edition.

Meuter, A. (2002). L-Vocalisation and labiodental variants of /r/ in the speech of Colchester primary school children – the acquisition of a sound change? Master's thesis, University of Essex.

Meyerhoff, M., Ballard, E., Charters, H., Birchfield, A., and Watson, C. (2021). The Auckland Voices Project: Language change in a changing city. In Peters, P. and Burridge, K., editors, *Exploring the Ecology of World Englishes in the Twenty-first Century: Language, Society and Culture*, pages 345–368. Edinburgh University Press, Edinburgh.

Mitchell, A. G. and Delbridge, A. (1965). *The Pronunciation of English in Australia*. Angus and Robertson, Sydney.

Mompeán, J. (2022). /r/-sandhi in the speech of Queen Elizabeth II. *Journal of the International Phonetic Association*, 52(2):246–277.

Mompeán, J. and Gómez, A. (2011). Hiatus-resolution strategies in non-rhotic English: The case of /r/-sandhi. In Lee, W.-S. and Zee, E., editors, *Proceedings of the 17th International Congress of Phonetic Sciences*, pages 1414–1417, Hong Kong. City University of Hong Kong.

Mompeán, J. and Mompeán-Guillamón, P. (2009). /r/-liaison in English: An empirical study. *Cognitive Linguistics*, 20(4):733–776.

Nielsen, D. and Hay, J. (2005). Perceptions of Regional Dialects in New Zealand English: A diachronic study. *Te Reo*, 48:95–110.

Nolan, F. and Kerswill, P. (1990). The description of connected speech processes. In *Studies in the Pronunciation of English: A commemorative volume in honour of A. C. Gimson.*, page 295–316. Routledge.

Oh, Y. M., Todd, S., Beckner, C., Hay, J., and King, J. (2023). Assessing the size of non-Māori-speakers' active Māori lexicon. *PLoS ONE*, 18(8):e0289669.

Oh, Y. M., Todd, S., Beckner, C., Hay, J., King, J., and Needle, J. (2020). Non-Māori-speaking New Zealanders have a Māori proto-lexicon. *Scientific Reports*, 10:22318.

Orange, C. (1997). *The Treaty of Waitangi*. Bridget Williams, Wellington.

Pavlík, R. (2016). A usage-based account of /r/-liaison in Standard British English. *Journal of Phonetics*, 54:109–122.

Pederson, L. (2001). Dialects. In Algeo, J., editor, *The Cambridge History of the English Volume 6: English in North America*, pages 253–290. Cambridge University Press, Cambridge.

Penney, J., Cox, F., and Gibson, A. (2024). Hiatus resolution and linguistic diversity in Australian English. *Phonetica*, 81(2):119–152.

Posit Team (2023). RStudio: Integrated development environment for R. http://www.posit.co/.

Rae, M. and Warren, P. (2002). Goldilocks and the three beers: Sound merger and word recognition in NZE. *New Zealand English Journal*, 16:33–41.

Ratko, L., Proctor, M., and Cox, F. (2023). Articulation of vowel length contrasts in Australian English. *Journal of the International Phonetic Association*, 53(3):774–803.

Ross, B. (2018). An Acoustic Analysis of New Zealand English Vowels in Auckland. Master's thesis, Victoria University of Wellington, Wellington.

Ross, B. (2024). *A New Look at Sound Change in New Zealand English*. PhD thesis, University of Auckland, Auckland.

Ross, B., Ballard, E., and Watson, C. (2021). New Zealand English in Auckland. *Asia-Pacific Language Variation*, 7(1):62–81.

Ross, B., Ballard, E., and Watson, C. (2023). Front vowel lowering in New Zealand English: Investigating a regional sound change. In Skarnitzl, R. and Volín, J., editors, *Proceedings of the 20th International Congress of Phonetic Sciences*, pages 3666–3670, Prague, Czech Republic. Guarant International.

Schneider, E. W. (2007). *Postcolonial English: Varieties around the world*. Cambridge University Press.

Shi, R., Gick, B., Kanwischer, D., and Wilson, I. (2005). Frequency and category factors in the reduction and assimilation of function words: EPG and acoustic measures. *Journal of Psycholinguistic Research*, 34(4):341–364.

Sim, J. H. (2023). Negotiating social meanings in a plural society: Social perceptions of variants of /l/ in Singapore English. *Language in Society*, 52(4):617–644.

Smits, K. (2019). Multiculturalism, Biculturalism, and National Identity in Aotearoa/New Zealand. In Ashcroft, R. T. and Bevir, M., editors, *Multiculturalism in the British Commonwealth: Comparative perspectives on theory and practice*, pages 104–124. University of California Press, Oakland, California.

Spero, M. (1996). L-vocalisation in Southeastern Britain. Master's thesis, University of Essex.

Sproat, R. and Fujimura, O. (1993). Allophonic variation in English /l/ and its implications for phonetic implementation. *Journal of Phonetics*, 21(3):291–311.

Stanley, J. and Lipani, L. (2019). Automatic Formant Extraction in Praat. https://joeystanley.com/downloads/191002-formant$_e$*xtraction.html*1$_i$*ntroduction*.

Starks, D. (2008). National and identity markers: New Zealand short front vowels in New Zealand Maori English and Pasifika Englishes. *English World-Wide*, 29(2):176–193.

Starks, D. and Bayard, D. (2002). Individual variation in the acquisition of postvocalic /r/: Day care and sibling order as potential variables. *American Speech*, 77(2):184–194.

Starks, D., Gibson, A., and Bell, A. (2015). Pasifika Englishes in New Zealand. In Williams, J., Schneider, E. W., Trudgill, P., and Schreier, D., editors, *Further Studies in the Lesser-Known Varieties of English*, pages 288–304. Cambridge University Press.

Starks, D. and Reffell, H. (2005). Pronouncing your Rs in New Zealand English? A study of Pasifika and Maori students. *New Zealand English Journal*, 19:36–48.

Stats NZ/Tatauranga Aotearoa (2024a). 2023 Census population counts (by ethnic group, age, and Māori descent) and dwelling counts. https://www.stats.govt.nz/information-releases/2023-census-population-counts-by-ethnic-group-age-and-maori-descent-and-dwelling-counts/.

Stats NZ/Tatauranga Aotearoa (2024b). Census results reflect Aotearoa New Zealand's diversity. https://www.stats.govt.nz/news/census-results-reflect-aotearoa-new-zealands-diversity/.

Stats NZ/Tatauranga Aotearoa (2024c). Net migration remains near record level. https://www.stats.govt.nz/news/net-migration-remains-near-record-level/.

Stats NZ/Tatauranga Aotearoa (2025a). Our region: Auckland. https://www.stats.govt.nz/infographics/detailed-regional-infographics-from-2023-census/our-region-auckland/.

Stats NZ/Tatauranga Aotearoa (2025b). Our region: Nelson. https://www.stats.govt.nz/infographics/detailed-regional-infographics-from-2023-census/our-region-nelson/.

Stats NZ/Tatauranga Aotearoa (2025c). Our region: Wellington. https://www.stats.govt.nz/infographics/detailed-regional-infographics-from-2023-census/our-region-wellington/.

Strycharcsuk, P., Derrick, D., and Shaw, J. (2020). Locating de-lateralization in the pathway of sound changes affecting coda /l/. *Laboratory Phonology*, 11(1):21.

Stuart-Smith, J. (1999). Glasgow: Accent and voice quality. In Foulkes, P. and Docherty, G., editors, *Urban Voices: Accent studies in the British Isles*, pages 201–22. Arnold.

Stuart-Smith, J., Pryce, G., Timmins, C., and Gunter, B. (2013). Television can also be a factor in language change: Evidence from an urban dialect. *Language*, 89(3):501–536.

Stuart-Smith, J., Timmins, C., and Tweedie, F. (2006). Conservation and innovation in a traditional dialect: L-vocalisation in Glaswegian. *English World-Wide*, 27:71–87.

Sudbury, A. and Hay, J. (2002). The fall and rise of /r/: Rhoticity and /r/-sandhi in early New Zealand English. *University of Pennsylvania Working Papers in Linguistics*, 8(3):281–295.

Szalay, T., Benders, T., Cox, F., and Proctor, M. (2022). Reconsidering lateral vocalisation: Evidence from perception and production of australian english /l/. *Journal of the Acoustical Society of America*, 152:2016–2116.

Thompson, G. E. (1921). *The question of a New Zealand dialect of English, with a phonetic examination of New Zealand vowels*. PhD thesis, University of New Zealand, Otago College, Otago.

Thompson, W. (1990). Attitudes to Maori and the use of Maori lexical items in english. *Wellington Working Papers in Linguistics*, 1:37–46.

Tollfree, L. (1999). South East London English: Discrete versus continuous modelling of consonantal reduction. In Foulkes, P. and Docherty, G., editors, *Urban Voices*, pages 163–184. Arnold, London.

Trudgill, P. (1974). *The social differentiation of English in Norwich*. Cambridge University Press.

Trudgill, P. (1986). *Dialects in Contact*. Blackwell, Oxford.

Trudgill, P. (2004). *New Dialect Formation: The Inevitability of Colonial Englishes*. Edinburgh University Press, Edinburgh.

Trudgill, P. and Gordon, E. (2006). Predicting the past: Dialect archaeology and Australian English rhoticity. *English World-Wide*, 27:235–246.

Trudgill, P., Gordon, E., and Lewis, G. (1998). New Dialect Formation and Southern Hemisphere English: The New Zealand Short Front Vowels. *Journal of Sociolinguistics*, 2(1):35–51.

Turton, D. (2017). Categorical or gradient? An ultrasound investigation of /l/-darkening and vocalization in varieties of English. *Laboratory Phonology*, 8:13.

Turton, D. and Lennon, R. (2023). An acoustic analysis of rhoticity in Lancashire, England. *Journal of Phonetics*, 101:101280.

Viollain, C. and Durand, J. (2020). On the New Zealand Short Front Vowel Shift. In Przewozny, A., Viollain, C., and Navarro, S., editors, *The Corpus Phonology of English*, pages 177–199. Edinburgh University Press, Edinburgh.

Wall, A. (1938). *New Zealand English: How it should be spoken.* Whitcombe & Tombs, Christchurch, New Zealand.

Walrond, C. (2004). Natural environment - geography and geology. https://teara.govt.nz/en/map/2639/a-far-flung-country.

Warren, P. (2002). NZSED: building and using a speech database for New Zealand English. *New Zealand English Journal*, 16:53–58.

Warren, P. (2006). Oops, I've done a futt: Quality and quantity in a New Zealand vowel contrast. *Te Reo*, 49.

Warren, P. (2018). Quality and quantity in New Zealand English vowel contrasts. *Journal of the International Phonetic Association*, 48(3):305–330.

Warren, P. and Bauer, L. (2004). Maori English: Phonology. In Schneider, E. W., Burridge, K., Kortmann, B., Mesthrie, R., and Upton, C., editors, *A Handbook of Varieties of English*, volume 1: Phonology, pages 614–624. Mouton de Gruyter.

Warren, P. and Hay, J. (2006). Using to sound change to explore the mental lexicon. In Fletcher-Flinn, C. M. and Haberman, G. M., editors, *Cognition and Language: Perspectives from New Zealand*, pages 105–126. Australian Academic.

Watson, C., Harrington, J., and Evans, Z. (1998). An acoustic comparison between New Zealand and Australian English vowels. *Australian Journal of Linguistics*, 18(2):185–207.

Watson, C., Maclagan, M., and Harrington, J. (2000). Acoustic evidence for vowel change in New Zealand English. *Language Variation and Change*, 12:51–68.

Watson, C. and Marchi, A. (2014). Resources created for building New Zealand English voices. In Hay, J. and Parnell, E., editors, *15th Australasian International Conference on Speech Science and Technology*, pages 93–96, Christchurch, New Zealand. Australasian Speech Science and Technology Association Inc.

Watson, C., Ross, B., Ballard, E., and Charters, H. (2019). Divergence of FACE and TRAP in Auckland English: A Potential Regional Sound Change in New Zealand English. In Calhoun, S., Escudero, P., Tabain, M., and Warren, P., editors, *The 19th International Congress of Phonetic Sciences*, pages 3210–3214, Canberra, Australia. Australasian Speech Science and Technology Association Inc.

Watson, C., Ross, B., Ballard, E., Charters, H., Arnold, R., and Meyerhoff, M. (2018). Preliminary investigations into sound change in Auckland. In *Proceedings of the 17th Australasian International Conference on Speech Science and Technology*, pages 17–21, Sydney, Australia. ASSTA.

Wells, J. C. (1982). *Accents of English*, volume 3. Cambridge University Press, Cambridge.

Wollum, E. (2020). *Auckland in formants: An acoustic analysis of New Zealand English*. Unpublished MSLTPrac. Paper, University of Auckland, Auckland.

Wright, S. (1989). The effects of style and speaking rate on /l/ vocalisation in local Cambridge English. *York Papers in Linguistics*, 13:355–365.

Xue, S. A. and Hao, G. J. (2003). Changes in the human vocal tract due to aging and the acoustic correlates of speech production: A pilot study. *Journal of Speech, Language, and Hearing Research*, 46(3):689–701.

Appendix A

Elicitation tasks

A.1 Picture description

Below are the ten drawings used in the picture description task

Fig. A.1 Prompt image 1

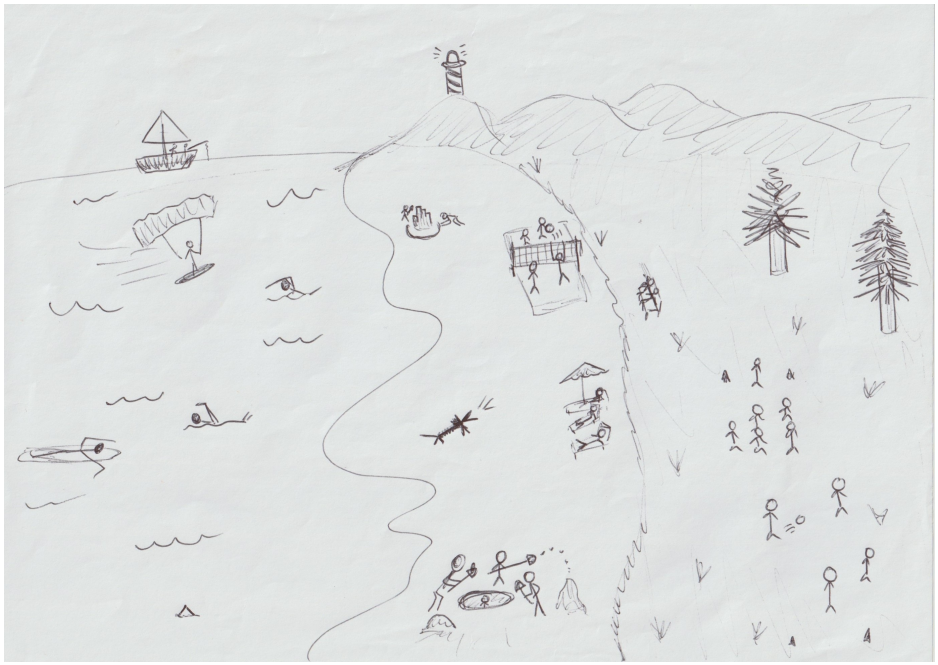


Fig. A.2 Prompt image 2

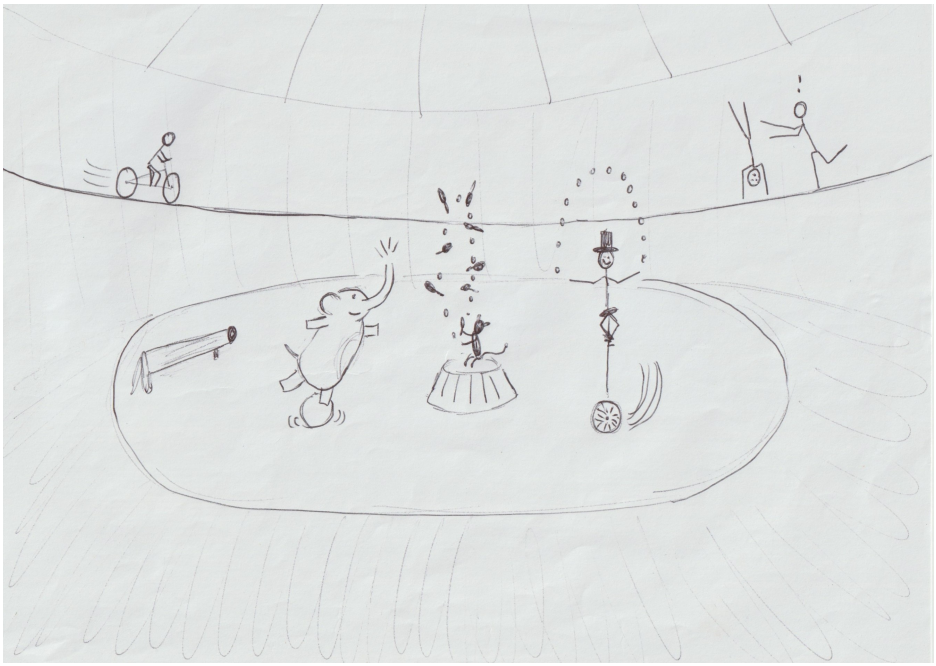


Fig. A.3 Prompt image 3

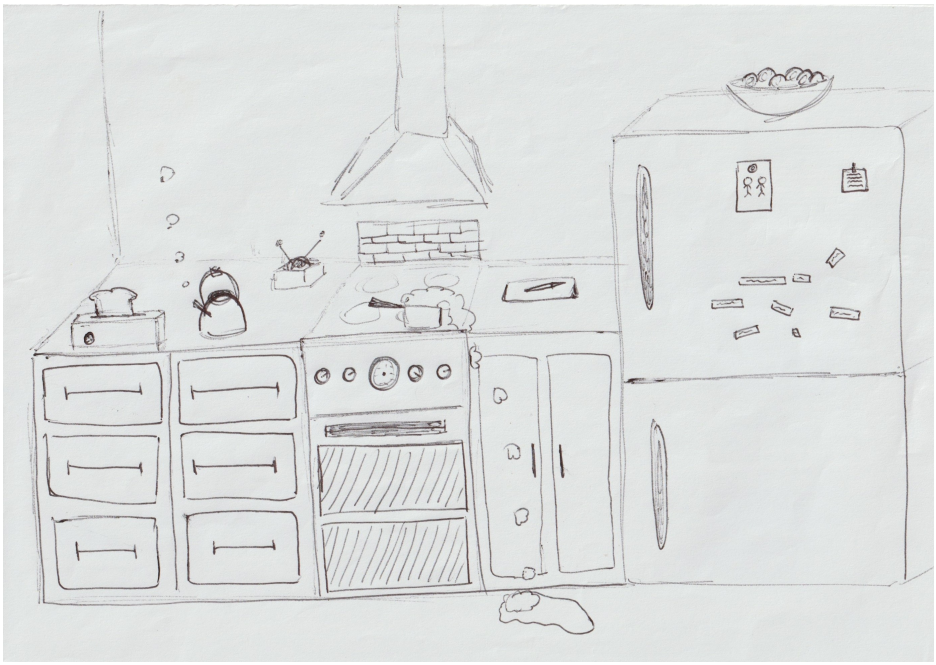


Fig. A.4 Prompt image 4

Fig. A.5 Prompt image 5

Fig. A.6 Prompt image 6

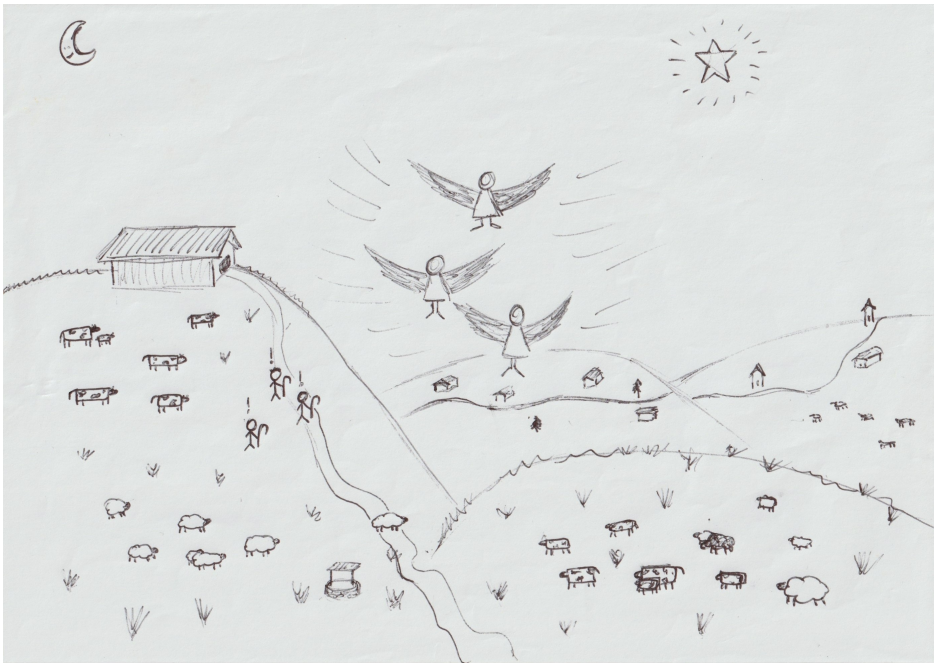


Fig. A.7 Prompt image 7

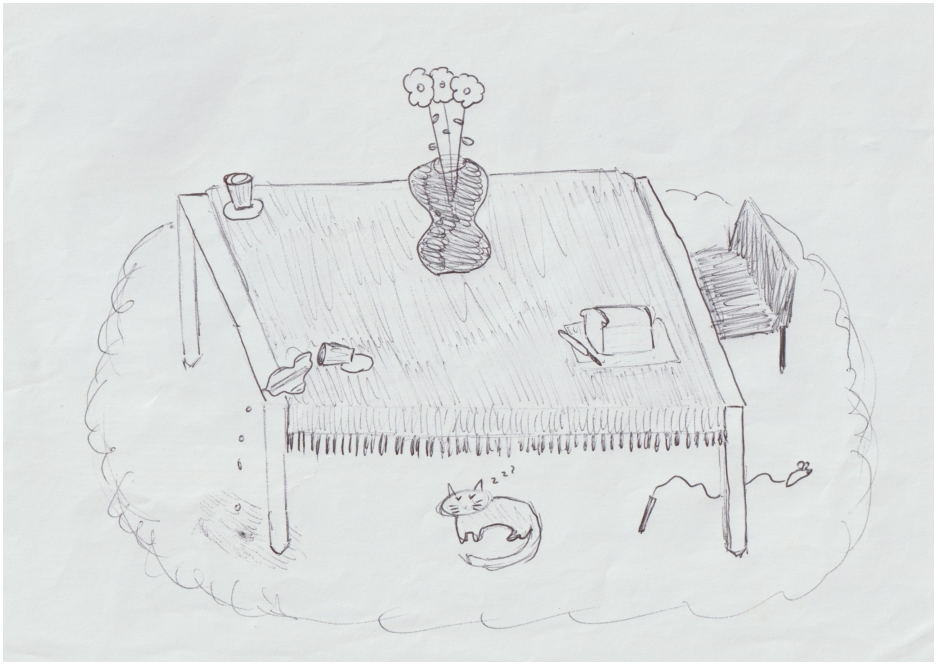


Fig. A.8 Prompt image 8

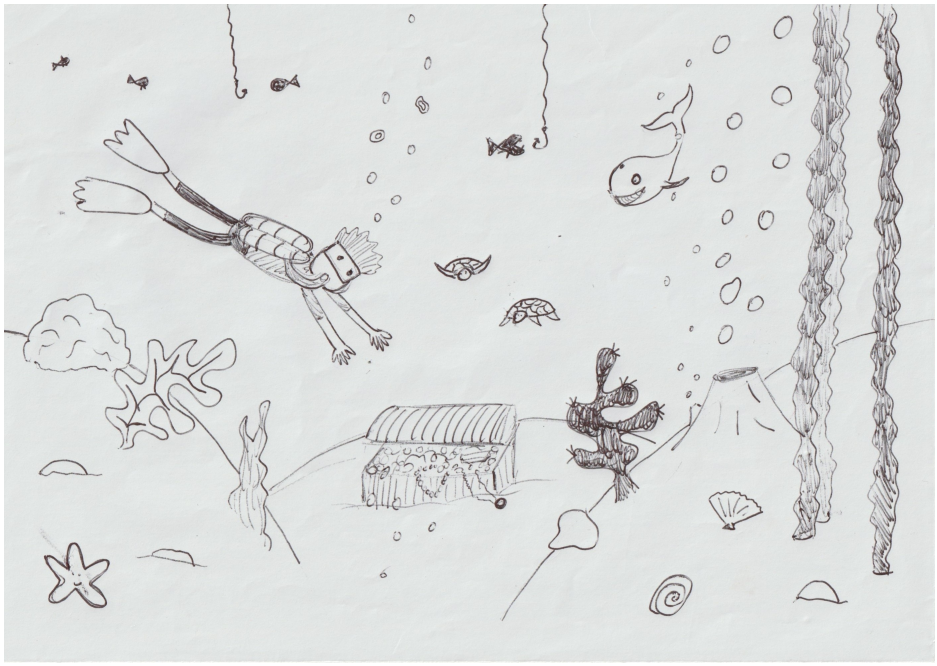


Fig. A.9 Prompt image 9

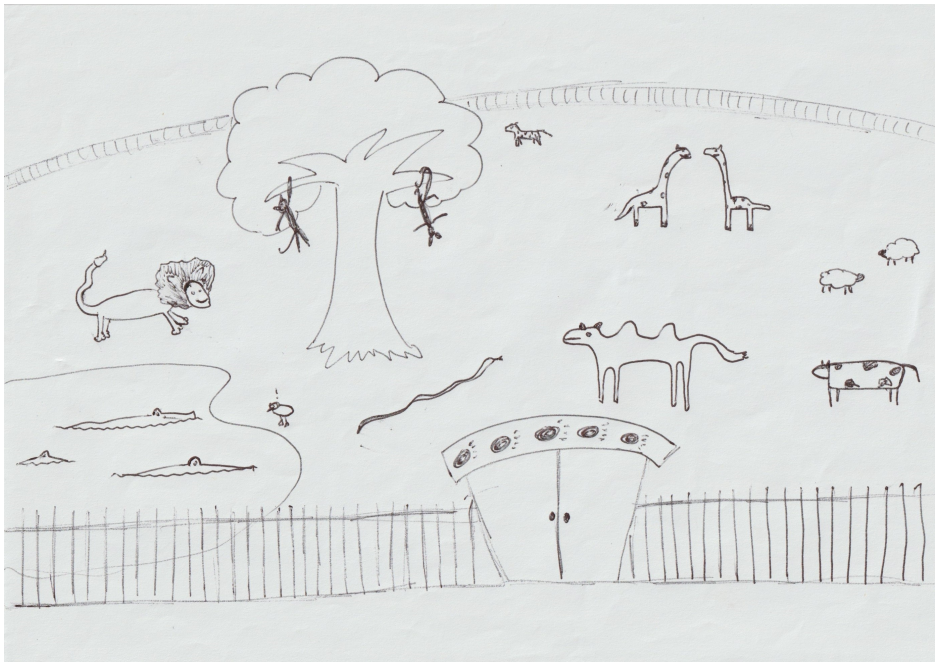


Fig. A.10 Prompt image 10

A.2 Reading task

Say “Heed” please.

This year, there were triple the number of fail grades at the local middle school.

Say “Comma” please.

It’s so humid in here it’s like being in the jungle.

Say “Stayer” please.

Say “Villagers” please.

I think she said she wanted an orange, or maybe an apple.

Say “Hard” please.

Before you try any fancy moves in gymnastics, your core has to be stable.

Say “Herd” please.

Did you say you wanted a single, or a double?

Say “How” please.

My favourite colour is purple, but my sister’s favourite is red.

Say “Who’d” please.

They wanted to interview the whole team, but only managed a couple.

Say “Foyer” please.

Say “Manages” please.

If you’re struggling to swim, you can always try using a pool noodle.

[end of page one]

Say “Hide” please.

Oh that’s Jeff, he’s always getting in some kind of trouble.

Say “Hod” please.

Don’t let them dull your sparkle.

Say “Tour” please.

Just sprinkle those bits over there and then we’re all good.

Say “Hoist” please.

Say “Villages” please.

Sometimes someone feels left out, but it’s just unavoidable.

Say “Hud” please.

The local music scene is good, especially when it’s choral.

Say “Nought” please.

We have Amy on bass, Jessie on keys, and Immie on vocals.

Say “Managers” please.

Say “Hoe” please.

We have six medals in athletics this year and twenty two medals in total.

Say “Hid” please.

Say “Pages” please.

[end of page two]

I think what he said in the speech was pretty normal.

Say “Had” please.

Say “Papers” please.

I was never great at mental maths, I preferred the notes to be physical.

Say “Hay” please.

Say “Stages” please.

There’s a lot of regional variation in this country.

Say “Ahead” please.

Say “Our” please.

The test on Tuesday is optional, but it’s recommended if you’re serious about finals.

Say “Hoard” please.

Say “Pagers” please.

Did you hear the principal shout at that student in the hall yesterday?

Say “Hood” please.

This year Canada were knocked out in the semi-final.

Say “Hair” please.

I have a hole in my shoe.

Say “Head” please.

[end of task]

Appendix B

Participant demographic information

Participant demographic information

Table B.1 Anonymised participant demographic information

ID	Age	Gender	Cultural and linguistic background
P01	34	M	Kiwi*
P02	77	F	New Zealander*
P03	27	M	European/Pākehā*
P04	85	M	Pākehā Kiwi*
P05	79	F	New Zealand European*
P06	62	F	New Zealand European
P07	66	F	New Zealand English
P08	30	F	NZ Chinese, Cantonese as heritage language
P09	35	M	Wellingtonian
P10	46	F	English speaker, learned other languages in late childhood
P11	22	F	New Zealand European, Wellingtonian
P12	22	F	Māori and Samoan, grew up in Wellington
P13	19	F	New Zealand Indian, speaker of Gujurati, Hindi and Marathi
P14	63	M	Croatian/Danish New Zealander
P15	55	F	Wellingtonian
P16	23	F	Pākehā, English family members
P17	32	M	Pākehā
P18	24	M	Pākehā
P19	37	M	Wellingtonian
P20	39	M	Monolingual English speaker
P21	27	F	New Zealand European
P22	42	F	Pākehā. British family, and a grandparent in Southland
P23	37	F	New Zealand European
P24	25	F	Māori and English NZ, learner of te reo Māori, and Portuguese and French more recently.
P25	44	F	New Zealander
P26	50	M	New Zealand European
P27	21	F	Cook Island, Samoan and European.
P28	19	M	Welsh New Zealander, German and French speaker since childhood
P29	28	M	New Zealand European
P30	66	F	Pākehā
P31	35	F	New Zealand European
P32	24	F	Chinese
P33	66	M	Pākehā
P34	37	M	Wellingtonian, bilingual in English and Khmer
P35	33	M	New Zealand European, some study of te reo Māori
P36	82	F	Primary school teacher
P37	29	F	Malaysian and Sri Lankan New Zealander, studied German to university level

*asked for ‘ethnicity’ rather than ‘cultural and linguistic background’