Marie Lacour

Phonological study of contemporary New Zealand English : What's the T ?

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PHONOLOGICAL STUDY OF CONTEMPORARY NEW ZEALAND ENGLISH: WHAT'S THE T?

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Marie LACOUR

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Abstract

This thesis offers a phonetic and phonological description of contemporary New Zealand English based on the existing literature as well as a quantitative study of a specific phenomenon, the realisation of /t/ as a voiced alveolar tap. The work is derived from the PAC New Zealand corpus and more specifically from two sub-corpora recorded in Christchurch and Wellington in New Zealand as part of the PAC programme (*Phonology of Contemporary English: usage, varieties and structure*). The analysis focuses on variation and change in New Zealand English through the lens of a specific sound change: the increasing use of the tapped variant. On the basis of a quantitative study of the realisations of /t/ in the corpus, it is shown that the use of the tapped variant is still a change in progress. Moreover, it appears to be a phonetically motivated sound change limited to casual speech styles.

Résumé

Ce mémoire est composé d'une description phonétique et phonologique de l'anglais néo-zélandais contemporain tirée de la recherche actuelle ainsi que d'une étude quantitative d'un phénomène spécifique, la réalisation du /t/ en battue alvéolaire voisée. L'étude est issue des données du corpus PAC Nouvelle-Zélande et plus particulièrement de celles de deux sous-corpus enregistrés à Christchurch et à Wellington en Nouvelle-Zélande dans le cadre du programme PAC (*Phonologie de l'Anglais Contemporain : usages, variétés et structure*). L'analyse se concentre sur la variation et l'évolution en anglais néo-zélandais grâce à l'étude d'un changement consonantique précis : l'usage de plus en plus fréquent de la battue alvéolaire voisée. Au moyen d'une étude quantitative des différentes réalisations de /t/ dans le corpus, il est démontré que la réalisation du /t/ en battue est toujours en cours d'évolution. De plus, elle semble être causée par des raisons phonétiques et limitée au discours informel.

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Lastly, I could not have written this thesis without the support of my wonderful parents and grandparents to whom I am forever indebted.

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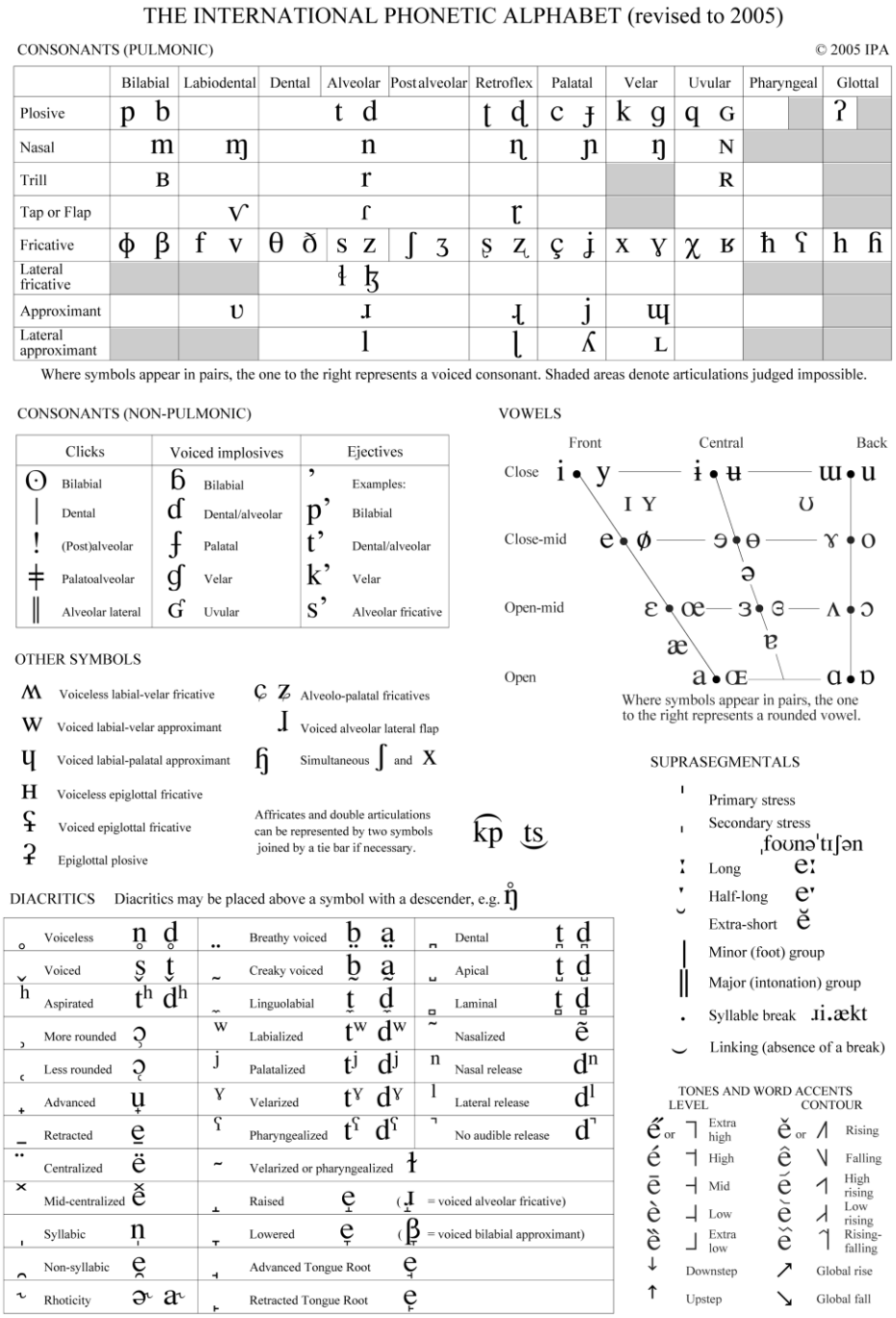
Conventions

The present study uses the symbols from the International Phonetic Alphabet available in the table[1] below.



[1] Table available at https://www.internationalphoneticassociation.org/content/full-ipa-chart#ipachartdoulos

Introduction

New Zealand is a historian's paradise; a laboratory whose isolation, size and recency is an advantage, in which the grand themes of world history are often played out more rapidly, more separately, and therefore more discernibly, than elsewhere.

James Belich, *Making peoples*

New Zealand English (NZE) is one of the youngest native varieties of English and therefore has not been studied as thoroughly and in depth as the majority of other varieties. It has most often been described as a variation of Received Pronunciation (RP) or Australian English until fairly recently. It has now been the object of many individual studies but still receives far less attention than RP or General American (GA).

The evolution of NZE as its own independent variety has coincided with New Zealand's search for a national identity and with the distance it has been taking from the British Empire. Studying NZE therefore allows us to establish fascinating links between the unity and identity of a country and its use of language. New Zealand was also one of the last places on Earth to be inhabited and this has allowed its linguistic development to be entirely recorded. This has not been the case for any other native variety of English. We therefore have access to corpora of NZE since its very first appearances and that is a unique opportunity to study the diachronic variation of language with an impressive amount of data. The Origins of New Zealand English project (ONZE)[2] is partly based on the Mobile Unit recordings, a set of recordings made between 1946 and 1948 which has allowed scholars to study the evolution of New Zealand English since its very beginning with actual data.

The specific position that New Zealand occupies as an old British colony in a world increasingly influenced by the United States is another factor that makes NZE a linguist's dream. The non-lexical consequences of the hegemony of American English have yet to be observed in the native varieties of English, and thanks to its culturally intermediary position, New Zealand is a perfect laboratory for linguists to try and detect any hint of a potential change towards the American variety. Its status as a member of the Commonwealth also makes it an ideal candidate to assess whether British influence is really waning as much as one would assume.

[2] https://www.canterbury.ac.nz/nzilbb/research/onze/

All these elements make NZE fascinating despite the small size of the country, its isolation, and its relative insignificance on a global scale. The present thesis aims at contributing to the study of the phonology of NZE and the theoretical debates around language variation and change that surround it. Instead of conducting a new study on one of the corpora traditionally used by researchers, I will analyse more recent data recorded for the PAC-LVTI corpora; this will allow me to determine whether the trends observed in NZE are upheld by modern data and to better understand the dynamics of language change in New Zealand.

The PAC programme (Phonology of Contemporary English)[3] is a project led by four French universities[4] which aims at building phonological corpora of the varieties of English spoken worldwide. The PAC-LVTI protocol (Language, City, Work, Identity) is specifically designed for the sociolinguistic description of language in urban contexts. Using PAC-LVTI corpora to conduct this study will therefore allow me to analyse recent, untreated data which could prove interesting for the study of NZE phonology.

In order to study variation in NZE phonology, I will focus on one specific phenomenon which has not yet been treated in the context of the PAC programme in NZE: the apparent progressive increase of t-tapping. John Harris (1994, p. 120) describes English /t/ as "one of the most unstable consonants in the language", and studying its variants can therefore prove very useful in understanding the forces that drive change in a variety of English. This study will therefore aim at assessing the current state of the trend, and will try to infer conclusions about the origins of that change.

The first chapter will start with an overview of the historical, cultural and linguistic context surrounding NZE, as I believe it is not possible to study a linguistic object without taking those elements into account. Learning about the country itself and all the parameters that surround the language will help us understand the object of the study, namely the phonological and phonetic system of NZE. I will then provide a brief phonological description of NZE which will assess the strengths and weaknesses of the various studies that have been done on the matter and discuss the theoretical issues that come with the fine line between phonetics and phonology. This first chapter will also touch on variation in NZE, focusing on both geographical and social variation in New Zealand.

The second chapter will investigate tapping in English. It will first provide a thorough description of the nature and the names of the phenomenon, and go over the specificities of

[3] https://www.pacprogramme.net/

[4] Université Toulouse Jean Jaurès, Université de Paris, Université Paris Nanterre and Université Aix-Marseille.

tapping in each major variety in which it takes place. It will also give context on tapping in NZE in order to set the stage for the following study. A brief sociolinguistic explanation of the potential origins of tapping in NZE will be given, as well as an overview of the questions which are yet to be answered.

The last chapter will consist in the study itself. I will first discuss the specificities of the chosen corpora as well as the methodology and software used in the treatment of the data. The results of the study will then be explained and discussed in light of the theoretical background compiled in the first two chapters.

Chapter 1: New Zealand English Phonology

This first chapter is concerned with the phonological system of New Zealand English, which must be described and understood in a broader sense before moving on to more detailed considerations. Just as the phonetic context of a sound must be taken into account in order to reach valid conclusions about that sound, the historical, cultural, social and phonological context of a dialect must be taken into account when studying any specific part of that dialect.

1 Historical Overview of New Zealand English

In order to understand the phonological system of a variety of English, it is first necessary to understand the context that surrounds it. Learning about New Zealand as a country and being cognizant of the origins and the features of NZE is therefore the first step towards having a full understanding of its phonological system. This first part is meant to give an overview of the elements that have factored into the way that NZE is today.

1.1 A Few General Elements

1.1.1 Geography

New Zealand, or *Aotearoa* (Maori word meaning *land of the long white clouds*) is an Oceanian country located in the South of the Pacific Ocean. It is one of the most isolated landmasses on Earth. It is also one of the last places in the world to have been settled. New Zealand is the largest Polynesian territory. It is made of several islands; the main ones are the North Island and the South Island. It is located more than 1600 kilometres south of Australia, which is its closest neighbour. (Dalziel et al., n.d.) Its capital, Wellington, is located in the south of the North Island. Auckland, its largest city, is in the north of the North Island. The map below[5] (see **figure 1**) shows the main New Zealand cities as well as the location of New Zealand in Oceania. New Zealand has a total land area of 268,021 square kilometres and is therefore a bit larger than the United Kingdom.

[5] Map available for download at https://www.britannica.com/place/New-Zealand

Figure 1.1: Map of New Zealand

New Zealand has progressively developed an image of paradise country thanks to its isolated location and its splendid landscapes. From the earliest settlements to this day, it has attracted nature enthusiasts and people looking for a new life. It was first seen by British immigrants as an Eden where one could settle and live an idyllic life. Today, the image of a heavenly land is still strongly associated to New Zealand and tourism is one of the biggest industries in the country.

1.1.2 Demography

About 4,951,500 people live in New Zealand, which means the country has a very low density of population given its size. 86.3% of New Zealanders live in urban areas. (*Home | Stats NZ*, n.d.) 15% of the population are descendants of the Maori, the first people to have settled New Zealand. The Pakeha (Maori word to designate the descendants of the European settlers) represent 60% of the population. 7% of New Zealanders have Pacific islands origins. (Dalziel et al., n.d.) New Zealand also has a significant South Asian and Middle Eastern diaspora.

1.1.3 Culture and Politics

New Zealand is part of the Commonwealth, although it has not been part of the British Empire since the ratification of the Statute of Westminster in 1947. It became a dominion in 1907 and was therefore already self-governing. (King, 2003, p. 246) Today, the country has a relatively significant impact on the international scene given its size and its low population. New Zealand has had a lot of influence regarding the anti-nuclear movement which led it to break its alliances with the United States and the United Kingdom. (King, 2003, p. 436) New Zealand is also the first country in the world to have given women the right to vote in 1893, doing so before the United Kingdom despite still being a British colony at the time. (King, 2003, p. 233)

English is not the only historical or even official language in New Zealand. The country has three official languages: English, *Te Reo Maori*, and New Zealand Sign Language. The recognition of the Maori language is of course based on historical reasons, as the New Zealand government has been trying to make amends for its colonial past and to treat Maori culture as an important and even essential part of New Zealand. *Te Reo Maori* is therefore used to a much greater extent than a lot of other indigenous languages.

1.2 A Brief Introduction to New Zealand History

1.2.1 First Settlers

As mentioned earlier, New Zealand is one of the last places in the world to have been settled. Because of its isolated location, it remained out of reach for navigators for much longer than any of the other big landmasses. Historians do not all agree on the exact date of arrival of the first human settlers in New Zealand, but recent studies tend to show that humans first arrived in New Zealand in the 13th century. (King, 2003, p. 42) The New Zealand government official history website has settled on that date too. (*A Brief History of New Zealand | New Zealand Now*, n.d.)

Historians have had an easier time agreeing on the identity of the first settlers. Everything seems to point to the fact that Polynesian navigators were the first human beings to set foot in New Zealand, and are therefore the ancestors of Maori civilization. (King, 2003, p. 23) There is more debate when it comes to their specific origin, and researchers struggle to agree on a few details like the places of departure of those Polynesian travellers as well as where they specifically arrived in New Zealand. They also disagree on the question of whether their

discovery of the country was accidental. (Viollain, 2014, p. 35) However, the fact that they were the first humans to discover New Zealand is no longer source of debate. The Maori thus settled on the islands and created an organized society, some aspects of which still exist in current New Zealand.

A Maori legend tells the story of the demigod Maui who fished the North Island out of the sea with his harpoon and thus gave birth to New Zealand. This colourful tale is a lovely introduction to the rich Maori culture that remains very present throughout the country.

Maori people lived in tribes called *iwi* which were mainly settled on the North Island. Those tribes were independent units which lived on distinct land areas. The main social unit in Maori society was the *whanau*, which encompassed the extended family. (Metge, 2013, p. 7) Family was therefore extremely important to Maori people, and Maori women were very respected. For instance, they were able to inherit land whereas Western women still could not. The Maori were a spiritual people which gave a lot of significance to everything sacred. (Metge, 2013, p. 9)

Maori culture is still very much alive in New Zealand, mainly on the North Island on which most of the tribes settled. After a concerning phase of decline, the Maori language *Te Reo Maori* is being used more and more thanks to revival strategies put into place by the New Zealand government. However, Maori society was of course deeply shaken by the arrival of European colonists in New Zealand in 1769, about five hundred years after the supposed date of arrival of the Maori.

1.2.2 The European Colonization of New Zealand

Dutchman Abel Tasman is actually the first European explorer to have discovered New Zealand. He arrived there in 1642 and drew the first maps of the region, even though he never really stopped in the country. He is therefore the one who gave New Zealand its name which comes from the Dutch region Zeeland. Tasman never set foot in New Zealand because of hostile encounters with the local population. He and his crew were forced to leave the country without any more information. (King, 2003, p. 84)

The first explorer to have had significant contact with New Zealand and its local population is the British captain James Cook, who made three voyages to New Zealand. He first arrived in New Zealand in 1769, more than a hundred years after Tasman's expedition. Unlike a lot of explorers at the time, James Cook was quite open-minded and was of the opinion that the Maori were the legal owners of their land. He also wanted to learn as much as possible about their

lifestyle. The Tahitian chief Tupaia was part of Cook's expedition and spoke a Tahitian language which was very close to *Te Reo Maori*. His translation skills were a big help which facilitated exchanges between James Cook's crew and the local tribes. (Wilson, n.d.) The first encounters between Maori and Europeans were relatively peaceful, barring rare conflicts based on misunderstandings. Those encounters seem even more successful when compared to similar but much more violent meetings in other colonized countries, like Australia.

The colonization of New Zealand therefore really started at the beginning of the 19th century, mainly in the shape of small enclaves which conducted a lot of trade with the locals. Most Europeans settlers were men working as sailors or whalers. Trade developed quickly, mainly thanks to the whaling and sealing industry. (Viollain, 2014, p. 38) Christian missionaries then started to take an interest in New Zealand and arrived in the country around 1810 to try and convert the Maori people. The Maori were quite receptive to the teachings of the missionaries but struggled to reconcile their lifestyle with some of the Christian obligations. (King, 2003, p. 121)

The trade of flax was another industry that developed very quickly. The Maori quickly realized its value to the Europeans and started to mass produce it so as to be able to buy a lot of another valuable good, the musket. Various Maori tribes quickly tried to buy as many muskets as possible so they could have an advantage in inter-tribe conflict. All that led to the Musket Wars which were the climax of inter-tribe violence for the Maori people. (King, 2003, p. 114)

The British Empire started to realize the increasing significance of New Zealand which was at the time still part of the Australian colony. William Hobson was sent as a representative to negotiate a treaty with the Maori people in 1840. The resulting treaty was called Treaty of Waitangi and established the sovereignty of the English monarch over New Zealand. Hobson managed to gather thirty-four Maori chiefs to sign the treaty, the *Te Reo Maori* translation of which is still a very controversial topic in New Zealand. (King, 2003, p. 134) The Treaty of Waitangi therefore constitutes the official beginning of the European colonization of Maori land, and the beginning of the conflicts between Europeans and Maori.

Along with the signing of the treaty came the first big wave of immigration from Europe. The *New Zealand Company*, largely responsible for that first wave, started a propaganda campaign in order to promote New Zealand in Great Britain. That first immigration wave coming from Britain was controlled and encouraged. On the contrary, the second immigration wave to New Zealand was provoked by a gold rush in Otago between 1853 and 1870 and was therefore very much self-motivated. It greatly reinforced the existing settlement and guaranteed their sustainability. The last wave came between 1871 and 1880. It was motivated by the New

Zealand government itself. New Zealand had gained quite a bit of autonomy by then and therefore handled immigration itself. About 100,000 immigrants, mostly British, came to New Zealand thanks to those government policies. (Viollain, 2014, pp. 40–41)

It is hard to know exactly where those immigrants came from. The main tool we have is the 1871 census, which has been extremely helpful to historians. According to that census, an overwhelming majority of them came from the British Isles. 51% of the migrant population in New Zealand were English, and 27.3% were Scottish. 22% were Irish. (Gordon et al., 2004, p. 44) Scottish immigrants tended to live in Otago and Southland, whereas Irish immigrants concentrated in the very north of the North Island. (Viollain, 2014, p. 43)

1.2.3 Towards Cohabitation

As European colonization of New Zealand was taking off, tensions started to grow between the Maori and the newcomers. The British Crown became more and more interested in New Zealand and settlers all wanted to own land which ended up threatening the Maori ownership of that land. There were more and more violations of the Treaty of Waitangi and a lot of disagreements ended up in violent conflict which later came to be called the New Zealand Land Wars. Those wars had a devastating effect on the Maori population which lost numerous lives as well as much of its land. The Land Wars remain a very sensitive topic in New Zealand history. (King, 2003, p. 188)

The turn of the 20th century is quite an important moment in the history of New Zealand identity. While the 19th century in New Zealand was riddled with war and violence, the 20th century stands for the path towards independence. The right for women to vote in 1893 can be considered to be the starting point of that era, which continues with the transition of New Zealand from colony to dominion in 1907 as well as its full independence in 1947. Other important events can be added such as New Zealand's participation in both world wars, the Great Depression of the 1930s which led to the establishment of the Welfare State, the Waitangi tribunal created in 1975 to start a repentance process and the anti-nuclear movement of the 1980s. (King, 2003) The 20th century thus allowed New Zealand to free itself from the yoke of the British Empire and to find its place in the world, as well as to establish its identity and its values in front of the international community.

1.3 English in New Zealand

1.3.1 The Origins of New Zealand English

The above overview of the history of New Zealand has allowed us to begin understanding the conditions in which English was implanted in New Zealand. It was brought by European settlers and came to become the most important language in New Zealand as the number of settlers overtook the number of Maori people in the country. As mentioned, most of the European settlers came from the British Isles, more specifically from the South-West of England, from Scotland, and from Ireland. It must be remembered that all of those settlers spoke various varieties of English depending on the place they came from. Since most of them were either Irish English speakers, English English speakers, or Scottish English speakers, it can be said that NZE originates in the British Isles; however, determining the exact way in which NZE developed and became its own variety is far from simple. From lay theories to academic disputes, the topic of the origins of NZE has been subject to debate for a long time. I am going to summarize the main theories chronologically and assess each of them in order to better understand and analyse the phonological system of NZE.

There have been multiple lay theories about the origins of NZE, and some of them have been extremely persistent despite their fanciful nature. Viollain (2014, p. 54) notes that their resilience is due to the fact that many famous, influential and educated people defended them. However, those lay theories seem completely absurd to a modern reader. One theory put forward the idea that the abundance of pollen in New Zealand and Australia had led to the nasal quality of those varieties of English. It was recently suggested that the popularity of false teeth in New Zealand was responsible for the New Zealand accent. A very popular theory argued that New Zealand children's laziness was to blame for the "degradation of English", as commentators called it. (Gordon et al., 2004, p. 69) I will of course not delve into those theories as they have not been supported by any study on the matter.

The first scientific theory on the development of New Zealand English is language contact, which postulates that two languages coming into contact influence each other. In the case of New Zealand, this means that the Maori language would have had a certain influence on NZE, both grammatically and phonologically. (Viollain, 2014, p. 55) In the early days, a lot of Europeans were fluent in the Maori language and the hypothesis therefore seems plausible. However, according to Gordon et al., the Maori language only had a lexical influence on NZE. All studies point to the fact that NZE grammar and phonology seem to purely originate from

varieties of the English language, and other languages including *Te Reo Maori* and minority languages like Chinese or German have only had lexical impact on the variety. (Gordon et al., 2004, p. 69)

A very popular explanation for the origins of both NZE and Australian English was that they were both derived from the Cockney dialect. That explanation came from the fact that Australian (and, by extension, New Zealand) vowels sounded very Cockney to British listeners. (Gordon et al., 2004, p. 71) However, several scholars argue that the explanation does not make demographic sense for New Zealand. Indeed, most British settlers were not Cockneys and would not have seen the Cockney dialect as desirable. Moreover, even though Cockney vowels and New Zealand vowels do present some similarities, their phonological systems are also very different. (Viollain, 2014, p. 57) That theory therefore does not make much sense when it comes to NZE.

A very similar single-origin explanation postulates that NZE might have been derived from the dialect of the south-east of England as well as London, therefore potentially including the Cockney claim. That theory is supposed to hold for all colony varieties of English: according to Lass (1990, quoted in Gordon et al., 2004, p. 75), "there is no ETE [Extraterritorial English, i.e. colonial variety of English] that is not a dialect of Southern English". It is clear that NZE, not unlike many other colonial varieties of English, has a lot of south-eastern English traits. However, as we will see with the description of some other theories, those traits do not have to have been transplanted directly and could have wound up in NZE through Australia, through the process of new-dialect formation or even through independent development. (Gordon et al., 2004, p. 75)

The last major single-origin theory about NZE postulates that it was derived directly from Australian English: NZE would therefore be a variety of Australian English. That explanation was put forward in the 1980s and the 1990s and is the most popular of all single-origin theories. It is supported by many scholars and has some supporting evidence. First, Australian English and New Zealand English are widely recognized as very similar. They are closer to each other than to any other variety of English and are often mistaken for each other. The theory also makes sense demographically, as many Europeans either came from or through Australia before settling in New Zealand. Lastly, their vocabulary is both extremely similar and widely different from that of other varieties of English, which would be explained if NZE comes directly from Australian English. (Gordon et al., 2004, p. 74) That explanation is therefore the most plausible single-origin theory. However, it has been questioned as well. Since there are not any recordings of early Australian English, it is difficult to establish such a close relationship with NZE. Some

researchers even believe that the number of Australian people who settled in New Zealand is too weak to signify anything and therefore dismiss the theory. (Viollain, 2014, p. 59) As we can see, the lack of data as well as the multiple possible origins of New Zealand English make this issue hard to solve once and for all. It has been argued in some more recent research that those single-origin theories are not necessarily mutually exclusive and that some Cockney or south-eastern English traits might have been introduced to NZE through Australian English. Those new theories claiming that NZE is rooted in a mixture of several dialects are called multiple-origin theories.

The first multiple-origin theory is the mixing bowl (or melting pot) approach, which has been applied to both Australian English and NZE. It postulates that the different origins of the colonists led to a "mixing" of dialects which eventually brought NZE about. The main theory associated to that line of thinking is called new-dialect formation. Gordon *et al.* (2004, p. 77) define new-dialect formation "as a process where, in a mixture of different dialects, different variants are levelled out and a single, new, focused dialect arises which is different in some ways from all the input varieties". Trudgill (2001, cited in Gordon et al., 2004, pp. 78–79) defines three different stages in new-dialect formation, which roughly correspond to generations. The first stage is rudimentary levelling and involves the initial contact between speakers of different languages. This leads to contact between languages and accommodation as the speakers try to understand one another. This stage is estimated to have lasted until 1860 in New Zealand. The second stage shows extreme variability and apparent levelling. In that stage, children grow up in an unstable linguistic environment since they cannot acquire a single dialect from their peers and since they have multiple adult models to learn from. Individuals who grow up in that kind of environment tend to show a lot of variability in their own speech, and there is a lot of inter-individual variability as well. However, that inter-individual variability may be more reduced than in stage one as some further levelling may be taking place. Trudgill estimates this phase to have lasted until around 1900. The third and last stage, focusing, involves a stabilization of the dialect which now appears crystallized. NZE has relatively little regional variation, which clearly shows the effects of that last stage.

Trudgill (2000) argues that new-dialect formation is shaped by determinism and is not a random process. This deterministic view argues that taking the same selection of dialects and transplanting them to a new location will lead to two similar varieties, as the mixture of languages that leads to the formation of a new dialect will follow specific linguistic rules. It therefore follows the principles of *koinéisation* (see Kerswill 2001). Trudgill (1991, p. 126) defines *koinéisation* as follows:

> This comprises the process of levelling, which involves the loss of marked and/or minority variants; and the process of simplification, by means of which even minority forms may be the ones to survive if they are linguistically simpler, in the technical sense, and through which even forms and distinctions in the contributory dialects may be lost. Where this occurs, reallocation may occur, such that variants originally from different regional dialects may in the new dialect become social-class dialect variants, stylistic variants, areal variants, or in the case of phonology, allophonic variants.

This deterministic view is obviously a big claim. Trudgill indeed argues that it is possible to determine what a future mixture dialect will look like, provided one knows enough about the original dialects and has sufficient demographic information about the proportion of speakers of each dialect. Many researchers have shown great interest in that theory. Gordon (2004, p. 239) shows that the ONZE Mobile Unit data (see introduction) supports determinism in new-dialect formation, and we can expect that many studies will continue to be made in that direction.

The question of the origins of NZE is therefore a complicated one, and it has to be emphasized that this is a very simplified and shortened account of the research that has been done on this broad topic. I am now going to move on to a short description of the lexical, discursive, and morphosyntactic features of NZE in order to better understand it.

1.3.2 Lexical and Discursive Features of New Zealand English

We will first focus on the lexical and discursive features of NZE. There have been a relatively big number of studies on NZE vocabulary, as it is the most noticeable thing about the dialect after its phonological system. As we saw earlier, NZE has been in contact with several other languages. Although we have established that language contact is not directly responsible for NZE, it has had some lexical influences, primarily with the Maori language.

The widespread presence of the Maori language throughout the country has had notable consequences on NZE. For instance, a lot of toponyms come from *Te Reo Maori* like the city names Tauranga and Rotorua. Many words relating to the fauna and the flora also have Maori origins. Some Maori words designating demographic categories are also used in English, like *Pakeha* which is the term used for the descendants of European settlers. (Bardsley, n.d.) Lastly, although English is the first language of a large majority of the New Zealand population, it is

not rare to hear Maori greetings within an English conversation. The Maori language has therefore had a big lexical impact on NZE.

Outside of Maori loan words, NZE vocabulary shares many similarities with British English vocabulary and is of course most similar to Australian English vocabulary. We have investigated the shared origins of NZE and Australian English and their connection holds when it comes to vocabulary. A few differences can be pointed out like the Australian word *thongs* for the New Zealand *jandals*, but they remain fairly close from a lexical standpoint. *Te Reo Maori* influence on NZE is one of the elements that helps distinguish them, as the Maori language is not present in Australia.

A certain American influence on NZE can also be noted. New Zealand English uses the American variant in a few cases where the American word differs from the British word, for example with *truck* (*lorry* in British English) or *elevator* (*lift* in British English). (Hay et al., 2008, p. 76) This phenomenon is most likely due to the omnipresence of American TV and music in New Zealand, which will be discussed more extensively in later parts of this thesis.

The most striking discourse feature in NZE is the very commonly used tag particle "eh". That feature is easily spotted and very frequently used in New Zealand. However, it is not seen as a positive feature by everyone. Meyerhoff writes:

> Few features of New Zealand English (NZE) are more eagerly recognized by New Zealanders as a marker of their identity than the tag particle eh. Yet its use is far from celebrated. New Zealanders will readily acknowledge this tag as being quintessentially "Kiwi," but many will then go on to either disclaim usage or to make disparaging comments about others' use of it. (Meyerhoff, 1994, p. 367)

She goes on to comment on the sociolinguistic aspect of the use of the particle and argues that its negative connotations are a reflection of the negative attitudes of the New Zealand community towards the prime users of 'eh', Maori speakers. (Meyerhoff, 1994, p. 385) The particle, although widely used, is therefore not a feature that is proudly claimed by the majority of New Zealanders. However, it seems to have now reached all categories of the population, including Pakeha women. (Hay et al., 2008, p. 81)

Another discourse feature that is gaining momentum in New Zealand is the use of is the use of *like* as both a quotative and a discourse marker. (Hay et al., 2008, p. 82) This is not surprising as it has been more and more used in most varieties of English. A study by Drager (2006) suggests that the quotative *like* in New Zealand high school girl speech is phonetically

distinct from the other uses of *like*. It is however hard to determine if that phonetic distinction is limited to New Zealand youth.

Despite its occasional oddities, NZE is fairly similar to other varieties of English in terms of lexical and discourse features, which is part of the reason why those elements are generally less investigated than its phonology. Studies are however being led on the direction that NZE will take and its current influences in which lexical features play a big part.

1.3.3 A Morphosyntactic Overview of New Zealand English

For this description of NZE to be complete, I now have to provide an overview of its morphosyntactic features. A fairly restricted amount of research has been led on that topic because of the relative lack of morphosyntactic features specific to NZE. Standard features in NZE are very similar (if not almost identical) to standard features in other varieties, and non-standard features share a big overlap with non-standard features elsewhere. Nevertheless, I will try to describe a few specificities of NZE morphosyntax. This list of features is far from exhaustive, as NZE morphosyntax is a wide-ranging topic, but I will try and select the features most important to the understanding of the variety.

Verb forms are the first and most salient morphologic feature of NZE. The difference in the use of irregular past participles between British English and American English is well known. Such past participles include *burned*/*burnt*, *spoiled*/*spoilt*, *dreamed*/*dreamt*, or *proved*/*proven*, in which the first variant is used in the United States and the second in the United Kingdom. Usage in New Zealand varies a lot, and the country is therefore located somewhere in the middle. (Hay et al., 2008, p. 50) Bauer (2007, p. 12) argues that the general trend is pointing to a change towards the use of the regular -ed spelling, but that change is still very much taking place.

Some other irregular verbs have different simple past and past participle forms in standard English, including in New Zealand, but a lot of speakers use the same form for the simple past as for the past participle. (Hay et al., 2008, p. 49) A lot of young speakers would therefore say *I swum* rather than *I swam*. Hay (2008, p. 49) points out a clear difference in the frequency of use between genders, with women using the non-standard form a lot more which is unusual because women tend to use very standard and prestigious language. However, since women are often leaders of linguistic change when that linguistic change happens below the level of consciousness, this potentially suggests that a change is taking place in favour of the new variant (see 3.2.3).

Another form that has been increasingly used is '*gotten*' as the past participle of the verb *got*. That form is very common in the United States. The use of '*gotten*' is interesting as it seems to be lexically restricted. Indeed, it cannot be used in the sense of 'have' as in '*I've got the idea*', both in NZE and in other varieties in which it is used. (Bauer, 2007, p. 12) Verb forms are therefore fairly variable in NZE but seem to be very similar to the variants present in other varieties of English.

Modals also undergo some variability. Hay (2008, p. 52) notes that the use of the modals '*shall*' and '*may*' has been declining whereas that of '*be going to*' has been on an upward trend. She also notices an increase in the use of the contraction '*gonna*' which once again could be explained by a potential American influence. Both Hay (2008, p. 53) and Bauer (2007, p. 14) mention the NZE use of the epistemic '*must'* in the negative, which appears in Australian English but would sound peculiar to a British speaker. Another feature of NZE is the more and more frequent pronunciation of contractions such as '*should've*' or '*wouldn't've*' as '*should of*' and '*wouldn't of*'. What started as a simple misspelling seems to have turned into a deeper change in the morphology of NZE. Bauer thus says that '*should of*' and '*would of*' are almost "being interpreted as new modal verbs". (Bauer, 2007, p. 15) This can lead to utterances such as '*should of not*' instead of '*should not have*'. (Hay et al., 2008, p. 54)

NZE tends to use the perfect aspect a lot more than other varieties of English. Hundt et al. thus note that the present perfect has been generalized to simple past contexts, such as sentences with the words *yesterday* or *ago*. (Hundt et al., 2008, p. 313) According to them, this usage has not made it into written NZE and remains a spoken feature. It is therefore a non-standard feature of NZE grammar.

NZE has a great deal of variability in terms of verbal agreement with collective nouns like *crowd*, *family*, or *team*. US speakers tend to always favour singular agreement, whereas British speakers have a choice between the singular and the plural. NZE speakers will favour one or the other depending on the word. According to Hundt (1998, cited in Hay et al., 2008, p. 56), NZE speakers strongly prefer the singular for some words like *team* but show a lot of variability with other words. Hay (2008, p. 57) also talks of the singular being used with existential *-there* plurals, as in '*there's a lot of trees*'.

The last feature I am going to comment on is the use of the singular '*they*' to talk about someone whose gender is unknown. Although criticized by many prescriptivists, that feature is very common in New Zealand. Hay (2008, p. 59) even gives examples of New Zealanders using it for a person whose gender *is* known, which shows the extent of its usage.

As I have shown above, the lexical, discursive, and morphosyntactic features of New Zealand English do present quite a few interesting elements which are worth investigating. However, they are far from being the most unique and recognizable elements about New Zealand English. I have now explored the context surrounding the NZE phonological system. Knowing about New Zealand as a country, about its history, and about the state and history of English in New Zealand seems indispensable in order to be able to fully understand the state of the phonological system in modern NZE as well as topics such as variation in NZE. I am now going to get to the heart of the matter and give a detailed description of the current phonological situation in New Zealand.

2 Phonetico-phonological Description of New Zealand English

Several descriptions of the NZE phonological system have been made, but they have not led to any widely accepted transcription model for NZE. When a scholar is trying to decide on a phonemic transcription model for a dialect of English, they are indeed faced with a dilemma: they can either use a conservative system so as to retain consistency regarding the phonological systems of other dialects, or they can try and make their system be as close as possible to the phonetic realization of each sound. The issue therefore lies in the fine line that distinguishes phonetics and phonology, as they cannot exist without each other and yet are sometimes hard to reconcile. Nevertheless, I will try to give an accurate description of each of the sounds of the NZE phonological system as well as assess several possible transcription models for a few controversial vowels. This analysis will therefore mainly be rooted in phonology, but it will necessarily include some phonetic considerations.

2.1 Vowels

2.1.1 Short Vowels

a) The KIT vowel

The KIT vowel is one of the most studied sounds in NZE because of its extreme distinctiveness. It is indeed notoriously centralized. According to Bauer and Warren (2008, p. 47), there is no distinction between the KIT vowel and the *commA* vowel (that is to say the neutral vowel schwa) in a non-final position. In a final position, /ə/ tends to have a more open realization. (Wells, 1982a, p. 606) Bauer and Warren (2008, p. 47) note that the vowel before

[ŋ] in words like *sing* has a much closer realization that other KIT vowels, and is often associated to the FLEECE vowel by New Zealand linguistics students. They argue that there are three possible explanations for that phenomenon: "(i) it is a close allophone of the same vowel as in KIT; (ii) it is an allophone of the vowel FLEECE, and the only tense vowel permitted before [ŋ]; (iii) it is a stressed variant of the *happY vowel*". (Bauer & Warren, 2008, p. 47) According to them, the same variant also appears in front of the velar plosive [g] in words such as *big* or *wriggle* for some speakers. These observations emphasize how difficult it is to uncover the phonological system of a variety. Bauer and Warren (2008, p. 47) add that should the KIT vowel be paired with a similar but tense vowel, the NURSE vowel is the closest in terms of vowel quality. This observation is very interesting as the question of length opposition is complex in NZE. Indeed, the traditional long/short vowel pairs are modified in NZE (Hay et al., 2008, p. 25), as we can see with the KIT vowel which is usually paired with the FLEECE vowel. Moreover, length opposition in NZE seems to be pertinent on a phonetic level, but according to Hay et al., it might not be pertinent phonologically. (Viollain, 2014, p. 114)

Wells (1982a, p. 606) chooses to represent the KIT vowel as /ə/, which seems coherent since their realization is mostly similar. He argues that the choice between /ə/ and /ɪ/ is arbitrary, but that the phoneme chosen must be used consistently for both the KIT and the *commA* lexical sets. Hay et al. (2008, p. 22) disagree, since they choose /ɪ/ to represent the KIT lexical set and /ə/ to represent the *commA* lexical set. That choice is hard to understand since they also define the KIT vowel as a mid-central vowel. Moreover, they also claim that "one effect of the centralization of KIT in NZE is that there is almost no audible difference between KIT and the neutral vowel schwa, usually written /ə/." (Hay et al., 2008, p. 23) Why then would they choose two different symbols to represent them? Viollain (2014, p. 106) offers the beginning of an answer by citing Hay et al (2008, p. 23): "NZE linguistics students use KIT much more often in transcription than speakers of other varieties of English, because they tend to use it for most unstressed syllables except in word-final position in words like butter." Viollain (2014, p. 106) therefore seems to argue that since New Zealand linguistics students tend to use /ə/ exclusively in a final position, the KIT vowel and the *commA* vowel cannot be represented by the same symbol because they are not completely merged on a phonological level. For her, the fact that the students never use /ɪ/ in a final position indicates that the two vowels occupy different spaces in the NZE phonological system. Bauer and Warren (2008) as well as Viollain (2014, p. 610) pick another solution: they choose the symbol /ə/ for the KIT vowel. That solution seems like the best for several reasons: first, it manages to keep the opposition between the KIT vowel and the *commA* vowel, which was not possible with Wells' solution. Secondly, it is consistent with

the actual realization of the vowel, contrary to Hay et al.'s choice of a symbol. Thirdly, /ə/ seems more in line with the variation in realization of the vowel as it is slightly closer than /ə/.

b) The DRESS vowel

The DRESS vowel is very close in NZE, to the point that Bauer and Warren (2008, p. 47) pair it with the FLEECE vowel as it is the most similar long vowel. RP or GA speakers regularly mistake NZE *pen* for *pin*, which shows the extent to which the vowel has been raised. (Hay et al., 2008, p. 24) According to Bauer and Warren (2008, p. 47), there is neutralization with the SQUARE diphthong before /r/ as well as with the TRAP vowel before /l/, which makes *ferry* and *fairy* as well as *Alan* and *Ellen* homophonous.

All transcription models use /e/ for the DRESS vowel. We can assume that scholars want to keep it consistent with the transcription models of other dialects of English. However, it is interesting that no scholar has questioned changing the symbol despite the significant raise of the vowel, even in the models where the KIT vowel phoneme is /ə/ or /ə/.

c) The TRAP vowel

Just like the DRESS vowel, the TRAP vowel is very close in NZE. Moreover, it shows no signs of becoming more open. (Bauer & Warren, 2008, p. 48) Hay et al. (2008, p. 42) explain the chain shift phenomenon that led to the change in all three short front vowels: according to them, the TRAP vowel was the first to raise and started crowding the acoustic space of the DRESS vowel which had to raise and which in turn encroached on the acoustic space of the KIT vowel. The KIT vowel could have raised as well, as in Australian English, but it centralized then lowered instead. The TRAP vowel stabilized a bit higher than [ɛ]. The DRESS vowel continued to raise and is now encroaching on the space of FLEECE, which is increasingly diphthongal because of the chain shift. We will discuss the FLEECE vowel more in detail in the next section, as well as further implications of the chain shift. To come back to the TRAP vowel, Bauer and Warren (2008, p. 48) note that it cannot be paired with any long vowel.

Both Wells (1982a, p. 609) and Hay et al. (2008, p. 22) chose /æ/ as a phonemic transcription of the TRAP vowel, which means they are favouring consistency between different systems. However, Bauer and Warren (2008, p. 41) as well as Viollain (2014, p. 610) go with the symbol /ɛ/, which is much more representative of the phonetic realization of the

vowel. That seems to be the most faithful and coherent solution, especially if paired with a new symbol for the KIT vowel.

d) The STRUT vowel

Bauer and Warren (2008, p. 48) describe the STRUT vowel as a "near-open central-to-front" vowel and note its nearly identical formant structure to the long vowel START, which means that the two vowels would mainly be distinguished based on length/tension.

In terms of representation, they choose the symbol /ɐ/ (2008, p. 41), as does Viollain. (2014, p. 610) Wells (1982a, p. 609) and Hay et al. (2008, p. 22) keep /ʌ/ as a phonemic transcription, which is in line with their other choices. However, it seems that /ɐ/ is much more coherent, especially in terms of its pairing with the START vowel and their nearly identical formant quality. If we assume that a START/STRUT long/short pairing is phonologically relevant in NZE, it follows that this pairing must be represented when transcribing its phonological system.

e) The LOT vowel

The LOT vowel is a bit more centralized in NZE than in RP. According to Bauer and Warren (2008, p. 48), it could be transcribed as [ɵ̞]. They also note that it cannot be paired with any long vowel in NZE. They add that there is neutralization with the GOAT diphthong before coda-/l/, which makes *doll* and *dole* homophones. Wells (1982a, p. 609) also talks of a neutralization with STRUT which would make *doll* and *dull* near homophones, although he claims that they are very similar but not identically pronounced.

In terms of phonemic transcription, no transcription model changes the RP symbol for the LOT vowel and it therefore remains /ɒ/, which is not surprising since the vowel is not extremely different.

f) The FOOT vowel

The FOOT vowel in NZE is undergoing some change. According to Hay et al. (2008, p. 24), it is becoming more central and less rounded. The most visible example is the word *good* which is becoming very central even when it is stressed, but most famously in the expression *g'dday*. Bauer and Warren (2008, p. 48) argue that it has two different variants occurring in different lexical contexts: the conservative variant [ʊ], a "centralized back slightly rounded

vowel", is the main occurrence, while the innovative variant [ɨ] is a central vowel that appears in the word *good*. There is neutralization with GOOSE before /l/ and words like *full* and *fool* are therefore homophones. The /l/ is vocalized and leaves its place to a [u:] vowel in both cases. There is also neutralization with KIT before coda-/l/ in words like *fill* and *full*. Bauer and Warren (2008, p. 49) add that the FOOT vowel should be paired with the THOUGHT vowel as they are most similar in terms of formant structure.

All models choose /ʊ/ as a phonemic representation for the FOOT vowel, which once again shows a will to retain consistency with other transcription models of English.

The NZE short vowel system has therefore undergone a lot of change, and it has become necessary to distinguish its phonological system from that of RP. The above description of each vowel and the way they have been transcribed in the literature shows the difficulty in staying consistent in terms of representing both the surface phenomena, that is to say the phonetic aspect of the sounds, and the underlying structure. That issue will be discussed further in the coming sections and the coherence of the short/long distinction for NZE vowels will be questioned.

2.1.2 Long Vowels

a) The FLEECE vowel

The FLEECE vowel in NZE is slightly diphthongized. Hay et al. (2008, p. 24) note that its onglide is not as marked as in Australian English. That is not surprising because the KIT vowel, which has been raising in Australian English, has pushed the FLEECE vowel to diphthongize. In NZE, the KIT vowel has centralized, and it is the raise of the DRESS vowel which has been pushing the FLEECE vowel. The delay in the diphthongization of the FLEECE vowel in NZE is therefore understandable. Hay et al. add that the diphthongization mainly happens in the stressed occurrences of the FLEECE vowel. Bauer and Warren (2008, p. 49) note that the FLEECE vowel and the NEAR diphthong are neutralized before /r/ and /l/, and that the vowel heard is monophthongal in those cases.

In terms of phonemic representation, almost all systems transcribe the FLEECE vowel as /iː/, which is to be expected since it is generally the case in Australian English in which the diphthong in the FLEECE vowel is much more marked. Hay et al. (2008, p. 22) prefer to use /i/ since their transcription model does not underline the length of any vowel. They may have made that choice in order to avoid unwanted associations like the pairing of KIT and FLEECE

which is not a reality in NZE. As has been mentioned in the previous section, the FLEECE vowel is closest to the DRESS vowel in terms of vowel quality and the two are sometimes only distinguished by length. However, young speakers have been producing long DRESS vowels, which has contributed to the diphthongization of the FLEECE vowel. (Hay et al., 2008, p. 25) The fact that speakers are starting to use longer DRESS vowels is interesting because it suggests that the long/short vowel pairings might only be coherent on a phonetic level in NZE. Going towards the diphthongization of FLEECE rather than keeping the short/long opposition between DRESS and FLEECE shows that the opposition of a short vowel system and a long vowel system might not hold any phonological truth in NZE.

b) The START/BATH/PALM vowel

As mentioned above, the START vowel is nearly identical to the STRUT vowel in terms of formant quality. For a lot of speakers, they are only distinguishable in terms of length or tension. This means that the START vowel is central, or even front of central according to Hay et al. (2008, p. 23) They add that the START vowel is one of the most recognizable features of NZE and Australian English, especially for speakers from the southern hemisphere. Modern New Zealanders use the START vowel for the BATH lexical set as well as the PALM lexical set, unlike American speakers and many Australian speakers who use the TRAP vowel for words in the BATH lexical set. (Hay et al., 2008, p. 23)

Wells (1982a, p. 609) chooses the symbol /aː/ for the START vowel (as well as the BATH vowel, to which he dedicates an additional line in his table). Hay et al. (2008, p. 22), in line with their transcription of the FLEECE vowel, choose /a/. Both Bauer and Warren (2008, p. 41) and Viollain (2014, p. 610) use /ɐː/ which makes more sense in terms of realization of the vowel, since it is closer to a central vowel than to a front one, and in terms of length, especially when paired to /ɐ/ as the STRUT vowel.

c) The THOUGHT/NORTH/FORCE vowel

The THOUGHT vowel is a very close vowel in NZE. Bauer and Warren (2008, p. 50) note that for some speakers, THOUGHT and FOOT are only distinguished by length. They add that the vowel can be diphthongized, notably at the end of an utterance (e.g. [foˑ.ɐ] for *four*).

As could be expected, Wells (1982a, p. 609) and Hay et al. (2008, p. 22) respectively choose the symbols /ɔː/ and /ɔ/ for the THOUGHT vowel, while Bauer and Warren (2008, p. 41) as

well as Viollain (2014, p. 610) prefer going for the less conservative but more phonetically accurate version /oː/.

d) The GOOSE vowel

While Wells (1982a, p. 607) and Hay et al. (2008, p. 24) describe the GOOSE vowel as "very central", Bauer and Warren (2008, p. 50) go as far as calling it a front vowel which would be comparable to the Australian GOOSE vowel. However, they add that when it is followed by /l/, GOOSE becomes a back vowel and the /l/ disappears, unlike in Australian English. The words *spoon* and *spool* therefore have very different vowels in NZE. Scholars also note that the GOOSE vowel can be diphthongized. Bauer and Warren (2008, p. 50) note that its starting element is very short and near [ə], but they also claim that there might be a significant change in the vowel since New Zealanders are starting to use a wide diphthong close to the GOAT diphthong, which only used to happen in the speech of young children.

Wells' (1982a, p. 609) phonemic transcription for the GOOSE vowel is /uː/ and Hay et al.'s (2008, p. 22) is /u/, non-surprisingly as their transcription models favour inter-dialect coherence. Bauer and Warren (2008, p. 41) choose /ʉː/ which once again follow their model's phonetic accuracy trend.

e) The NURSE vowel

The NURSE vowel is also a very distinctive sound in NZE. It has a very close pronunciation and might even overlap with the GOOSE vowel according to some acoustic studies. (Bauer & Warren, 2008, p. 50) Bauer and Warren even talk of a possible NURSE-GOOSE merger, which does not seem to be happening just yet. That however brings interesting questions about the way in which these two vowels are distinguished. They suggest [ø̟] as a possible pronunciation of the NURSE vowel. Hay et al. (2008, p. 24) argue that the most salient feature of the NURSE vowel is that it is rounded, within a dialect that is "distinguished by its relative lack of lip rounding" (notably because of the lack of rounding of the FOOT vowel).

Following their respective trend for long vowels, Wells (1982a, p. 609) chooses /ɜː/ and Hay et al. (2008, p. 22) /ɜ/. Bauer and Warren (2008, p. 41) as well as Viollain (2014, p. 610) decide on /ɵː/.

The long vowel system in NZE seems to have undergone slightly less systemic change as the short vowel system, but it does show several interesting phenomena which indicate that long vowels in NZE could be the theatre of a lot of future change.

2.1.3 Diphthongs

NZE has undergone a diphthong shift which applies to FACE, PRICE and CHOICE, which have all moved one spot anti-clockwise from their RP equivalents. The NEAR/SQUARE merger is also much talked about. (Bauer & Warren, 2008, p. 51)

a) The FACE diphthong

According to Bauer and Warren (2008, p. 51), the NZE FACE diphthong has a very open starting point and British speakers can even mistake it for the PRICE diphthong. Bauer and Warren choose /æe/ to transcribe it, which suggests that its ending point is also lowered. On the contrary, Wells (1982a, p. 609) chooses /ʌɪ/ which is interesting since it seems to indicate that the FACE diphthong is also significantly more back in NZE. However, he does not make any direct remarks about it, so it can safely be assumed that /æe/ is a more accurate phonemic transcription. Hay et al. (2008, p. 26) use /ei/, probably so as to avoid using the same symbol for the KIT vowel and the ending point of the FACE diphthong since they have very different qualities.

b) The PRICE diphthong

Bauer and Warren (2008, p. 51), who are the first to really comment on the closing diphthong shift, note that the PRICE diphthong has a much further back starting point. They add that British speakers might even perceive it as CHOICE, particularly in the case of broad accents for which the realization might be rounded and closer to [ɒe]. They choose the symbol /ɑe/ for the standard NZE diphthong, both at the phonetic level and the phonemic level. When followed by a /ə/ in words like *fire*, PRICE gives either a disyllabic sequence or a monophthong.

c) The CHOICE diphthong

The CHOICE diphthong is not very commented on, but Bauer and Warren (2008, p. 51) note that its first element is much closer, near the position of the THOUGHT vowel. They choose /oe/ for the phonemic transcription.

d) The GOAT diphthong

The GOAT diphthong's starting point is very open and central. According to Bauer and Warren (2008, p. 51), the second element is very similar to the GOOSE vowel. Those observations are supported by Hay et al. (2008, p. 26) who nonetheless choose to represent it with the symbol /oʊ/. Bauer and Warren (2008, p. 41) use /ɐʉ/, following their trend of using phonetically representative and very non-traditional symbols.

e) The MOUTH diphthong

Bauer and Warren (2008, p. 52) note that the MOUTH diphthong in NZE has a fairly close starting position. They add that it is phonetically very close to the DRESS or TRAP vowel added to a vocalized /l/, which the next section will explain further. Words like *twelve* or *health* can therefore sound like they have a MOUTH diphthong. That observation is also significant on a phonological level, since according to Bauer and Warren, the distribution of MOUTH is widening to pre-labial and pre-velar contexts in words like *help* and *talc*. Just as in PRICE, the MOUTH diphthong followed by a /ə/ in words like *power* gives either a disyllabic sequence or a monophthong resembling the START vowel. (Bauer & Warren, 2008, p. 52)

In terms of phonemic representation, Bauer and Warren (2008, p. 41) choose the symbol /æʉ/.

f) The NEAR/SQUARE diphthong

NEAR and SQUARE are very commented on in studies about NZE phonology because they have been undergoing a merger. This merger has created the well-known homophony of *beer* and *bear* for a lot of NZE speakers. Young speakers do not make a distinction between the two diphthongs. In fact, Bauer and Warren (2008, p. 52) even note that those young speakers are not able to perceive any distinction between them. They add that it seems like the resulting

diphthong is moving towards a close variant, [ɟə]. FLEECE and NEAR (and therefore SQUARE) are sometimes neutralized in the shape of a monophthong, usually before /r/ and /l/.

Somewhat surprisingly, Wells (1982a, p. 608), Hay et al. (2008, p. 26), Bauer and Warren (2008, p. 41) and Viollain (2014, p. 610) use /iə/ for NEAR and /eə/ for SQUARE, probably because the merger has not stabilized just yet and is not present in all speakers. Viollain does add /iə/ as a possible transcription for the SQUARE diphthong.

g) The CURE diphthong

As in other English dialects, the CURE vowel is becoming rarer in NZE. It has been replaced by the THOUGHT vowel except when it follows /j/. Bauer and Warren (2008, p. 52) note that its starting point is close to that of GOOSE, and that its end-point is open and central. They add that it may become disyllabic in open positions.

The CURE vowel is transcribed as /ʉə/ by Bauer and Warren (2008, p. 41).

The vowel system is by far the most distinctive feature of NZE, which is why it has been studied fairly extensively. Its analysis can lead to many interesting questions about linguistic change. Although the consonants of NZE are not as distinctive as its vowels, describing them can also reveal some things about the development and the evolution of the dialect.

2.2 Consonants

2.2.1 The /r/ Consonant

NZE belong to the non-rhotic varieties of English, which means that only pre-vocalic /r/ is pronounced. It is therefore closer to RP than to GA in that regard. However, several interesting phenomena surround the /r/ phoneme in NZE. First, Bauer and Warren (2008, p. 54) note that two words are frequently pronounced with a rhotic /r/. The first is the name of the 'R' consonant itself, and the second is the country *Ireland*. They add that those two words are heard with the postalveolar approximant [ɹ] across regions and social classes.

They also note that the influence of American movies and TV shows has led to a non-pre-vocalic /r/ being pronounced in some frequent words and expressions like *whatever*. This lexically driven type of rhoticity is particularly interesting as it suggests that NZE is being influenced by GA. The influence is only lexical for now and does not seem to have affected the non-rhotic system of NZE, but it proves that GA can and does have an influence on NZE.

They add that there is a tendency to use non-pre-vocalic /r/ following the NURSE vowel in New Zealand hip-hop music, despite the fact that that music is usually produced by people of Maori or Pacific Islands ethnicities who should theoretically not be more rhotic than other New Zealanders. That is interesting and can be linked to the previous point, as hip-hop music originates in the United States. American influence could also be responsible for rhoticity in hip-hop music and take precedence over the ethnicity of the musicians.

Bauer and Warren (2008, p. 54) conclude that rhoticity is variable throughout New Zealand, and that it is much more common following the NURSE vowel. That claim opens the door to interesting research questions.

On a phonetic level, Hay et al. (2008, p. 18) note that /r/ becomes a fricative when it is in the clusters 'tr' and 'dr'. The quality of those clusters is also undergoing a change and is moving from [tr] to [tʃr] and from [dr] to [dʒr]. They add that the 'str' cluster is moving to [ʃtr]. That development is relatively novel and is therefore still in progress. Bauer and Warren (2008, p. 54) explain that the slight retroflexion of the /r/ was passed on to the whole of the cluster and was then reinterpreted by younger speakers as [ʃtr].

As in the majority of non-rhotic accent, there is a *linking r* phenomenon in NZE. This means that /r/ is pronounced at the end of a word if the following word starts with a vowel. In the case of the *linking r*, r is present in the spelling of the word. (Hay et al., 2008, p. 18)

The *intrusive r* is very similar to the *linking r*, but it happens when there is no r in the spelling of the word. Hay et al (2008, p. 18) describe the *intrusive r* as happening "after a non-high vowel, when it is followed by another vowel across a word or morpheme boundary". However, that seems to be changing, as Bauer and Warren (2008, p. 56) argue that the use of the *intrusive r* is being extended to an environment following MOUTH. That is very interesting as it seems to indicate a modification in the phonological constraint.

The *linking r* and the *intrusive r* are usually grouped in the literature under the umbrella term *sandhi r*. For more advanced research on those phenomena, Viollain's thesis on NZE phonology (2014) includes a very comprehensive study on the *sandhi r*.

2.2.2 The /t/ Consonant

As in RP, the /t/ consonant is usually aspirated in initial stressed syllables. However, it often becomes an alveolar tap between sonorants. Tapping can occur between word boundaries if the /t/ is word-final. When the /t/ is word-initial, the aspiration prevents the tapping. (Bauer & Warren, 2008, p. 53) Bauer and Warren (2008, p. 53) add that there may not be any difference

between an intervocalic /t/ and an intervocalic /d/, since both are tapped. This potential neutralization has yet to be confirmed by studies. Finally, they note that the tapping phenomenon might be starting to be replaced by a glottal stop, but there is too little evidence to confirm that claim.

The tapping of the /t/ consonant may be another sign of American influence on NZE, and the new feature has been criticized as too Americanized. (Viollain, 2014, p. 146) The second and third chapter of the present thesis will therefore investigate whether GA has anything to do with the emergence of /t/ tapping in NZE.

2.2.3 The /l/ Consonant

The phoneme /l/ has two allophones in many English varieties: the clear /l/ and the dark or velarized /l/. In NZE, an onset /l/ is clear unless it is preceded by a voiceless stop. According to Bauer and Warren (2008, p. 55), the clear /l/ in NZE is a bit velarized and could be transcribed by [lˠ]. In coda position, /l/ is more velarized and could be transcribed [lˀ] or [ɬ]. Bauer and Warren (2008, p. 55) also comment on /l/ vocalization, which is a variant of the dark /l/ in coda position. A vocalized /l/ gives a vowel of varying quality which can be merged with the preceding vowel to form a monophthong, a diphthong, or a disyllabic sequence. The quality of the resulting vowel is subject to debate, but there is no doubt about the /l/ vocalization phenomenon itself. (Viollain, 2014, p. 147) As mentioned earlier, some instances of /l/ vocalization can clash with the MOUTH vowel as they can be phonetically similar. (Bauer & Warren, 2008, p. 55)

2.2.4 Other Consonants

The opposition between /w/ and /ʍ/ holds historic truth in New Zealand, as it is present in the recordings of the first generations of NZE speakers. (Hay et al., 2008, p. 33) Those speakers would therefore use /w/ for *witch* and /ʍ/ for *which*. However, it seems like that opposition has mostly disappeared in phonetic terms. Most phonologists recognize a phonemic opposition, but they are divided as to whether the *which* consonant should be transcribed as /ʍ/ or /hw/. Hay et al. (2008, p. 33) and Bauer and Warren (2008, p. 56) decide on /hw/ without making the reasons for their choice explicit. However, Viollain (2014, p. 148) argues that since /h/ was historically not very present in NZE, using /ʍ/ is much more logical as there is no reason why the /h/ in the /hw/ sequence would have been pronounced consistently when its other occurrences were not. She also claims that [ʍ] might not be a phoneme but an allophone of /w/, which is supported

by Hay et al. (2008, p. 34) according to whom only women with privileged backgrounds from the south of the South Island keep a phonological distinction between the two.

According to Bauer and Warren, "/w/ and /j/ are strongly devoiced following stressed-syllable-initial [p, t, k]." (2008, p. 56) The phoneme /j/ is also devoiced in words like *huge* or *hue*.

Yod-dropping is very variable in New Zealand and depends on the environment. The approximant /j/ is sometimes not realized after fricatives. Yod is very rare after /l/, /θ/, and /s/; it is variable after /n/ in words like *New Zealand*. (Bauer & Warren, 2008, pp. 56–57)

Finally, TH-fronting seems to be gaining momentum in NZE. /θ/ and /ð/ are therefore realized as /f/ and /v/ more and more often. According to Hay et al. (2008, p. 38), it is "one of the faster growing sound changes in NZE at present."

2.3 Suprasegmental Elements

Even though the segmental system of NZE is the main object of this thesis, briefly describing its suprasegmental system seems necessary. Just like morphosyntax and discursive features, suprasegmental elements contribute to what makes NZE its own distinct variety of English. I will therefore comment on intonation, rhythm, and lexical stress in NZE.

2.3.1 Intonation

The most striking intonation feature in NZE is the presence of High Rising Terminals, or HRTs. HRTs are a rise in the pitch at the end of declarative sentences. Usually, pitch only rises at the end of interrogatives or to express uncertainty. However, NZE speakers have a strong tendency to have a rise in their pitch in declaratives. That feature is not only present in NZE as it has been noticed in many other dialects. (Viollain, 2014, p. 164) However, it is still relevant to describe it as HRTs are very common in NZE.

In the beginning, HRTs tended to be more common in female speech than in male speech, which led sociolinguists to assume that women expressed uncertainty more often than men. (Hay et al., 2008, p. 28) However, as more studies were being led on the matter, they realized that the feature was in fact a positive politeness marker whose function was "to include the hearer in the discourse". (Bauer & Warren, 2008, p. 62) It therefore seems like young women were using them more because they valued politeness more than other speakers. Today, the feature has spread and all speakers in New Zealand use HRTs. Moreover, it seems like Maori

speakers are using them more often than other speakers, which opens the door to interesting sociolinguistic studies. (Hay et al., 2008, p. 29)

2.3.2 Rhythm

English is considered a stress-timed language. However, the rhythm of NZE is more complicated than that. It has been noted that NZE has a strong tendency towards syllable-timing; it is much more syllable-timed than varieties like RP. (Bauer & Warren, 2008, p. 61; Hay et al., 2008, p. 30) One of the explanations for that syllable-timing is that NZE tends to use full vowels in unstressed syllables. For example, the days of the week tend to be pronounced with a FACE diphthong rather than a neutralized /i/ like in RP. It is thought that the syllable-timed Maori language might be influencing the rhythm of NZE. (Hay et al., 2008, p. 31) Indeed, studies have shown that Maori English is significantly more syllable-timed than Pakeha English. (Szakay, 2006, p. 426)

2.3.3 Lexical Stress

NZE tends to follow the RP stress patterns in most words. However, there are some little differences. Words such as *spectator, dictator,* and *frustrate* follow the American stress pattern and are stressed on the first syllable. *Agriculture* is stressed either on the first or the third syllable. There is usually a strong secondary stress in words that end in *-ary/-ory*. (Bauer & Warren, 2008, p. 61) Hay et al (2008, p. 29) add that in two-syllable noun/verb pairs where the noun is usually stressed on its first syllable and the verb on its last, NZE tends to stress both on the first syllable. The noun *an ˈimport* and the verb *to ˈimport* would therefore both be stressed on the first syllable, as opposed to in RP where the verb would be *to imˈport*.

Hay et al. (2008, p. 31) also note that there is significant evidence that NZE is much faster paced than other varieties of English.

This description of the segmental and suprasegmental systems of NZE has clarified its specificities and shown what makes NZE a unique variety of English. It has also pointed to some potentially interesting gaps in the literature on which future research could focus. However, in order to provide a complete description of English as it is used in New Zealand, the different kinds of variation present in the country have to be recounted as well. The next part of this thesis is therefore going to focus on variation in New Zealand.

3 Variation and Evolution in New Zealand English

Now that I have given an account of the phonology of NZE, it must not be forgotten that such a short phonological description cannot be considered all-encompassing nor can it be applied to all NZE speakers. There is a big amount of language variation in New Zealand which needs to be tackled in order for this account of the phonology of NZE to be complete.

3.1 Geographical Variation

3.1.1 A Relatively Unified Country

NZE is known for being a fairly homogeneous variety of English that does not have much geographical variation. As mentioned earlier, New Zealand was one of the last places in the world to be settled, and that has impacted the amount of language variation in the country. That can first be explained by the fact that a large majority of the people who settled in New Zealand came from the South of England, and an overwhelming majority came from the British Isles. There was therefore a limited amount of variety in the dialects that are at the origin of NZE. (Gordon & Maclagan, 2008, p. 65) Of course, many different dialects were still spoken by the early settlers, but there was nowhere near as much diversity as in the formative years of countries such as the United States and the United Kingdom, who have much more geographical phonological variety than New Zealand today. The only notable exception is the Southland region, which was mainly settled by Scottish immigrants. Unsurprisingly, it is now the only region with a distinctive regional dialect, which is widely recognized has having heavy Scottish influences. (Gordon & Maclagan, 2008, p. 66)

The lack of regional variety is also due to the fact that New Zealand was settled very late. That means that NZE has been spoken for a much shorter time than other dialects of English. It also means that NZE developed at a time where ease of travel and of communication was increasing. There has always been very good communication infrastructure throughout the country. The various settlements were very rarely isolated for long periods of time, and that allowed levelling to happen between the different settlements. (Hay et al., 2008, p. 96) The example of the United States makes that phenomenon clear: The East coast was settled much earlier than the West coast, and it has a lot more regional variation. It is therefore understandable that New Zealand would not have a lot of geographical variation.

Lastly, some scholars have another theory as to why New Zealand does not show a lot of regional variation. According to Bauer and Bauer (2002, p. 169), regional variation in

Australian English has been increasingly noticed and commented on since the 1980s. According to them, this means that the process of development of regional variations might be in its infancy in NZE. They therefore argue that dialect differentiation might happen in the future. That is an interesting hypothesis and since that paper was written twenty years ago, the next sections will try to evaluate its merit.

3.1.2 The Southland Dialect

As mentioned earlier, the dialect spoken in Southland is the most distinctive regional dialect in New Zealand. This instance of regional variation is widely recognized by scholars as the main if not the only form of regional variation in NZE. As its name indicates, Southland is located at the very south of the South Island. Its main cities are Invercargill and Gore. What is locally known as the "Southland Burr" originates in the predominance of Scottish immigrants in the Southland settlements, and traces of Scottish settlers' original dialect can still be found in the Southland dialect. (Hay et al., 2008, p. 98)

The first significant study on Southland English was led by Bartlett (1992) and it is summed up by Gordon and Maclagan (2008, pp. 67–68). According to Bartlett, most features of Southland English appear in the normal range of variation for NZE. Those features might therefore just be more common in Southland English. However, there are also some distinctive features.

The main phonological feature of Southland English is that it is considered a partially rhotic dialect, as opposed to NZE which is a non-rhotic variety of English. The first interesting element of Bartlett's study is the fact that /r/ is realized as an approximant rather than rolled or flapped. This is surprising because speakers with the accent are often stereotyped as "rolling their r's", which appears to be an exaggeration. The second main feature of rhoticity in Southland English is the impressive amount of variation in terms of frequency of the /r/ phoneme. Indeed, Bartlett found that speakers over 65 years of age were a lot more likely to be rhotic. Speakers between the ages of 40 and 49 tended to have a lot of variation in their rhoticity, and speakers aged 15 to 19 only maintained /r/ before the NURSE vowel, in words like *first* or *term*. This shows that phonetic context matters a lot in the maintenance of the /r/ phoneme. Bartlett even notes that young speakers had a lot more tokens of rhoticity before the NURSE vowel than other age groups, which points to a potential development of rhoticity in Southland. Hay et al. (2008, p. 99) add that rhoticity before the NURSE vowel might be extending in the Otago region, and that it might be becoming a sign of Southern pride in New Zealand. In other

phonetic contexts, rhoticity is much more variable. Word-final /r/ is sometimes maintained, but preconsonantal /r/ is rare in the speech of a partially rhotic speaker. It therefore seems that rhoticity is a recessive trait in Southland, except preceding the NURSE vowel where the use of /r/ seems to be increasing possibly thanks to regional pride.

Rhoticity is not the only phonological feature of Southland English. Bartlett also notes that Southland speakers tend to use the TRAP vowel in places where other NZE speakers would use BATH, like *dance*, *chance*, or *castle*. However, Gordon and Maclagan (2008, p. 67) suggest that younger speakers are using the standard BATH variant and therefore that the feature might disappear.

Lastly, older speakers of Southland English still have a contrast between /w/ and /ʍ/. They tend to use /ʍ/ more in lexical words than in grammatical words. However, younger speakers seem to be losing the distinction. It seems that the opposition of /w/ and /ʍ/ has simply taken a bit longer to disappear from Southland than from the rest of the country. (Gordon & Maclagan, 2008, pp. 67–68)

3.1.3 Other Geographical Variation

All scholars agree on the fact that too few studies have been conducted on non-Southland geographical variation in New Zealand to be able to tell whether there might be other regional dialects. However, there have been many lay theories on the matter as non-linguists are often quick to decide that someone different from them also has to speak in a different way. (Gordon & Maclagan, 2008, p. 66) For example, it seems that most NZE speakers think New Zealanders from Taranaki (a town located on the west coast of the North Island) speak in a "sing-song" way. That lay theory is actually supported by a study by Ainsworth (2004) who found that Taranaki speakers' intonation patterns are more varied than in the rest of the country, although that points to the existence of a Taranaki accent rather than a Taranaki dialect. (Hay et al., 2008, p. 100) This is still a fairly isolated occurrence and most lay theories have not been proven nor disproven yet.

Bauer and Bauer's study (2002) on NZE in playgrounds provides a good insight into the regional variation situation in New Zealand. The country seems to be divided into three regions: a Northern region, which extends from the northernmost point to the volcanic area in the centre of the North Island, a Central region, which extends from the volcanic area all the way to the Waitaki river in the South Island, and a Southern region, which includes Southland and parts of Otago. It is surprising to notice that the central region includes parts of both the North and

the South Island, as some variation between North Island speakers and South Island speakers could have been expected. (Hay et al., 2008, p. 100) In conclusion, it seems like regional variation is far from non-existent in NZE as well as still evolving, and new studies will most likely tackle this question more in detail in the coming years.

3.2 Social Variation

3.2.1 Social Class in NZE

Many New Zealanders claim that New Zealand does not have social classes. That statement is based on the fact that New Zealand society is somewhat less hierarchical and less based on social class structure than some societies such as that of the United Kingdom. Indeed, the early New Zealand settlements were meant to replicate British society while removing the top and bottom layers of the social hierarchy. New Zealand would therefore be more homogeneous and lack a very high and a very low social class. (Hay et al., 2008, p. 101) There were still class boundaries, but they tended to be blurred and mixed together. However, New Zealand is far from being a classless society and social class differences do exist in the country. New Zealand scholars do not like to use imported systems of classification to describe New Zealand society. They have therefore designed a 6-point scale in which 1 is the highest social category and 6 the lowest. That scale is called the Elley-Irving scale and has become the standard New Zealand index. (Gordon & Maclagan, 2008, p. 69)

In terms of social classification, linguists often use the Australian system and define three social categories of NZE: Cultivated NZE, General NZE, and Broad NZE. As in the Australian system, they form a continuum on which Cultivated NZE is the closest to RP and Broad NZE the farthest. Today, General NZE is much more common than the other two varieties. (Hay et al., 2008, p. 101)

The diphthongs MOUTH, PRICE, FACE, and GOAT are the clearest markers of a speaker's social class. The realization of KIT, DRESS, and TRAP as well as NEAR/SQUARE can also give hints as to the speaker's social background. Speakers from higher social classes will tend to use variants close to the RP phonemes, whereas Broad NZE speakers will tend to use the most different variants. Most of the consonantal features of NZE (see 2.2) are also associated to social class. TH-fronting, /l/-vocalization, and /t/-tapping tend to be looked down upon by speakers of Cultivated NZE, as well as the affrication of *-tr* and *-str*. On the contrary, speakers from higher classes tend to retain the contrast between /w/ and /ʍ/. (Gordon &

Maclagan, 2008, p. 70) Hay et al. (2008, p. 102) note that the words *something*, *nothing*, *anything*, and *everything* are pronounced with a final /k/ by Broad NZE speakers.

Scholars agree on the fact that women are particularly likely to be stigmatized when they speak Broad NZE. A study by Elizabeth Gordon (1997) showed that female Broad accents were very readily stereotyped as lower class. The participants listened to a recording of a woman with a Broad NZE accent, and immediately identified her socio-economic status as low. When asked about her likely occupation, the participants' most frequent answers were 'unemployed', 'single parent', and 'prostitute'.

3.2.2 Ethnicity in NZE

Ethnicity also factors into social variation in NZE. The historical background of the country has led to the division of New Zealand society into two main ethnic groups: the Maori and the Pakeha. Several studies have been carried out on the difference in the speech of Maori and Pakeha people, and they have led to descriptions of what is called Maori English. Maori English must not be mixed up with *Te Reo Maori*, as the former is a dialect of English and the latter a completely different language.

Scholars agree that the distinctive features of Maori English are shared with standard NZE, which makes it difficult to establish boundaries between them. However, it is the distribution and the frequency of those same features that make Maori English distinct from NZE. It also seems that rather than simply being a single dialect, Maori English exists on a continuum that ranges from the most standard to the most vernacular. Maori English started as an ethnic variety of English, and it is still mainly spoken by people of Maori ethnicity. However, a lot of non-Maori people speak it, and not all Maori people speak it. It has now become more of a social marker than an ethnic dialect. It is more frequent on the North Island (due to its historically higher Maori population) than the South Island, and it is more frequently used by men than by women. It tends to be more frequent in informal situations; it is also more popular among lower social classes and among certain occupational groups like the military. (Hay et al., 2008, p. 105) Those characteristics all point to Maori English having a significant amount of covert prestige in New Zealand society.

The phonological system of Maori English is similar to that of standard NZE, but a lot of its phonemes are realized differently. The GOOSE vowel is very fronted in Maori English, probably because of the influence of the Maori language. Initial /t/ can be unaspirated, which is actually the only feature that is not found in standard NZE. TH-fronting is common, and *-th*

is also sometimes realized as /t/ or /d/. (Hay et al., 2008, p. 121) The KIT vowel is much less centralized in Maori English than in standard NZE, possibly because of the quality of the short /i/ vowel in *Te Reo Maori*. (Warren & Bauer, 2008, p. 81)

The rhythm of Maori English is much commented on. Indeed, as mentioned earlier in this thesis (see 2.3.2), Maori English has a strong tendency towards syllable-timing. That comes from the influence of the Maori language, which is mora-timed. In the Maori language, morae contain a vowel and any preceding consonant. It appears that the influence of mora-timing on stress-timed languages is similar to that of syllable-timing. It therefore makes sense that *Te Reo Maori* would be leading Maori English towards syllable-timing, as well as standard NZE to a lesser extent. (Warren & Bauer, 2008, p. 82)

3.2.3 Gender in NZE

NZE is similar to other varieties of English in the sense that women tend to be both more innovative and more conservative than men. Some sound changes are stigmatized, and the resulting phonemes therefore have a stigmatized variant and a non-stigmatized variant. In those cases, women tend to use the non-stigmatized variant and are therefore more conservative. For instance, women's starting point for the MOUTH diphthong tends to be less close than men's. On the contrary, some sound changes are not stigmatized because they are below the level of consciousness. In those cases, women tend to produce more tokens of the innovative variant than men. The evolution of the DRESS and the TRAP vowel in NZE seems to have stayed below the level of consciousness and do not have any social connotations. This means that women produce a lot more tokens of raised DRESS and TRAP vowels and are therefore leaders of linguistic change. (Gordon et al., 2004, p. 24) Hay et al. (2008, p. 102) call it the "white rabbit phenomenon", as women are very careful to pronounce the word *white* 'correctly' (which means the variant closest to RP) but do not pay the same attention to the raised TRAP vowel in *rabbit* and happily pronounce the innovative variant.

Women therefore appear to be innovative when they do not know change is happening, but conservative as soon as the relevant feature is noticed and socially connoted. This seems to be linked to the fact that women's place in society is less stable than men's and controlling their speech is a way for them to ensure the safety of their status. Moreover, innovative variants above the level of consciousness often appear 'rough', which is a negative quality when associated to a woman. That is why using conservative and therefore prestigious variants is desirable for women. (Viollain, 2014, p. 642) It could be inferred that since women tend to use

standard and prestigious language, innovative variants coming from women are more likely to be subconsciously reproduced by other people and remain in the language. Women would therefore act as language role models for society in general and that could explain why women tend to innovate more when the change is below the level of consciousness.

However, some linguists disagree with the idea that women are paradoxically both conservative and innovative. To them, studies are flawed in the sense that they group people belonging to several different linguistic categories together under the pretence that they have the same gender. Women who tend to use conservative variants would therefore not belong to the same group of women who use innovative variants. (Eckert & McConnell-Ginet, 2003)

3.3 Outside Influences

As has been established (see 1.3.1), NZE is much closer to the 'British' varieties of English than to the North American ones. It would therefore be a reasonable assumption to expect NZE to evolve alongside dialects like RP or Australian English. However, the prestige and the language attitudes associated to various dialects are changing, mainly because of globalization and of the soft power coming from the United States. This last section looks into the past, current, and future evolution of the phonology of NZE, as well as New Zealanders' changing accent attitudes.

3.3.1 NZE and RP

RP as we know it today is technically not at the origin of NZE, because it was most likely not the standard of the settlers who came to New Zealand. RP is far from being spoken by a majority of people in England, and the situation was no different in the 19th century when the big waves of immigration from England to New Zealand took place. Most settlers came from the London area or the south and more particularly the south-west of England. Today, Estuary English would be a better approximation of a dialect that has evolved in the area from which New Zealand settlers came. (Viollain, 2014, p. 211) However, Estuary English cannot be considered to have the same international outreach as RP. As NZE was developing, RP was still the most prestigious accent, which is why Cultivated NZE is the closest to RP and Broad NZE the farthest. RP has been the variety of English that New Zealanders most look up to for a long time. It thus could be inferred that RP still is the most prestigious dialect of English for New Zealand speakers, and that it influences NZE to this day.

New Zealand linguists have long been commenting on what is called the 'cultural cringe'. This phenomenon refers to the sense of inferiority that New Zealanders (as well as speakers of other colonial varieties of English) seem to have about their accents. That sense of inferiority often comes from the comparison to the standard of a so-called 'home' and very much stems from colonialism and the idealization of the colonizing country. (Bayard et al., 2001, p. 24) In the case of New Zealand, RP was therefore long considered the ideal standard and enjoyed a vast amount of prestige in New Zealand. On the contrary, NZE was considered a lesser variety and was deemed undesirable for a long time. That cultural cringe has remained and is most noticeable when young New Zealanders go overseas and find themselves embarrassed by the way they speak. (Hay et al., 2008, p. 104)

Many language attitude studies have been conducted in New Zealand in order to establish the extent of this cultural cringe as well as that of the prestige enjoyed by RP. However, more recent studies have shown that RP might not be as prestigious today as it once was. In their sociolinguistic experiment about accent attitudes, Bayard et al. (2001, p. 22) state that "the RP voices did not receive the higher rankings in power/status variables [they] expected". It therefore seems like the power shifting in the English-speaking world, and that even though RP still enjoys an impressive amount of prestige throughout the world, that assertion may not hold true in a few decades.

3.3.2 NZE and GA

At first glance, General American English does not seem to have much to do with the evolution of NZE as they have no historical link. However, American English has been gaining momentum in the international scene and might now be as widely recognized as RP, if not more. Over the course of the 20th century, the United States has become the most influential country in the world, and the current position of English as a global language is partly due to the amount of political and social power that America enjoys. English only used to be taught to non-natives speakers using the RP model; that is no longer true as numerous teachers are starting to favour GA which tends to be considered more international. (Bayard et al., 2001, p. 44) The RP monopoly of prestige is therefore compromised. This power shift poses the interesting question of the way in which colonial varieties of English are going to be affected.

To the lay eye, it already seems like New Zealand and Australia are culturally somewhere in between the United Kingdom and the United States. Indeed, some American vocabulary uses (see 1.3.2) and a few cultural borrowings (formal dances in high school, big celebration of the

twenty-first birthday) make it obvious that New Zealand is being influenced by the United States. Postulating that NZE phonology is also under that influence would not be a big stretch.

Several features of NZE that might have been taken from GA have already been mentioned in the present thesis (see 1.3.2, 2.2.1, 2.2.2, 2.3.3). The main influence of American English on NZE is lexical, but /t/ tapping as well as rhoticity in some specific phrases (popularized by TV shows) and hip-hop songs have also been linked to GA influence. The common denominator of those changes is the media, and it is clear that the global hegemony of American soft power is changing a lot of things about the English language everywhere. That claim is supported by the sheer amount of American TV, music, and films that are exported all over the world. Bayard et al. (2001, p. 41) insist on the importance of American TV in New Zealand and state that "it is very difficult to avoid the impression that much of this shift in overseas prestige standards in New Zealand has been caused at least to some extent by the spoken media".

The hegemony of American culture is not likely to decline anytime soon, and that leads to a lot of questions regarding the future of New Zealand English and of English in general. It certainly seems like GA will continue gaining prestige and influence and that RP will do the opposite, which will certainly have an impact on other varieties of English around the world. The following study will investigate the extent of the involvement of American influence in a specific sound change, tapping.

The above overview of variation in NZE and the analysis of its biggest sources of influence were necessary to paint a more complete picture of NZE, which is a lot more complex and ever-changing than the second part of this chapter might suggest. They have also allowed me to point to a few more areas in which further research could be highly interesting, like regional variation in New Zealand as well as the extent of the influence of GA on NZE. Variation in New Zealand English is still studied much less than in other varieties and it represents a great research opportunity.

4 Summary

The goal of this chapter was to offer a description of NZE phonology and its historical and linguistic context. It also aimed at providing a summary of the literature that surrounds NZE and at highlighting the areas of knowledge that call for more research. To reach that goal, I have given an overview of New Zealand history, provided insight into the lexical, discursive, morphosyntactic, and suprasegmental features of NZE, and presented a detailed description of the sounds of NZE. I have also described the various kinds of variation that exist in NZE and questioned its main sources of influence. By doing so, I have touched on several important linguistic questions that would deserve to be discussed in a lot more detail, such as the fine line between phonetics and phonology or the question of gender when it comes to linguistic innovation. The resulting chapter is hopefully successful in calling attention to the fact that NZE is a complex and fascinating variety of English which is worth investigating. This chapter has also permitted me to point to multiple features of NZE phonology that could become the topic of further research, one of which will be studied more in detail in the present thesis.

Chapter 2: Tapping

Before moving on to the last chapter which will investigate tapping in New Zealand English, it is imperative to provide an overview of that very phenomenon. Tapping is a complex phonological process which is still not completely understood. This chapter will therefore offer the context necessary to understand the need for the following study.

5 Overview of Tapping in English

5.1 Definition, Description and Designations

Tapping consists in the pronunciation of the voiceless alveolar stop /t/ as a voiced alveolar tap [ɾ] in certain contexts. It is often attributed to lenition, and is a relatively natural phonological process. It is also referred to by other names, including flapping and t-voicing. There has been a lot of debate as to the true realization and therefore the proper transcription and name of the phenomenon. Most phonologists do not make a distinction between taps and flaps, and the term flapping has been used more frequently than tapping. (Shockey, 2003, p. 29) However, several argue that the realization of the sound in question is much closer to a tap than to a flap. (Shockey, 2003, p. 29; Wells, 1982b, p. 249) Indeed, a tap tends to denote an up and down movement whereas a flap is a retroflex tap with a forward and back movement. (Ladefoged, 1993, p. 176) That is why this paper will refer to the phenomenon as tapping, although many referenced books and articles prefer the word flapping. It has also often been referred to as t-voicing, but as Wells (1982b, p. 248) states, "it is usually a rapid tap rather than a more deliberate plosive". T-voicing is therefore too simple a name, as it could lead people to think that there is no distinction between [ɾ] and [d]. Lastly, some linguists make a distinction between [ɾ] and [t̬] and argue that they follow different distributions. (Allen, quoted in Wells, 1982b, p. 249) However, for the sake of simplicity, this thesis will not enter the debate and will refer to taps as [ɾ] in all circumstances.

The exact conditions for tapping are not yet understood. According to Vaux (2000, p. 4), it applies to alveolar stops "after a sonorant other than l, m, or ŋ, but with restrictions on n; before an unstressed vowel within words, or before any vowel across a word boundary; when not in foot-initial position". It therefore appears mainly intervocalically but not exclusively, and generally has to precede an unstressed vowel when it occurs within word boundaries. Exceptions include words such as "eighteen" in Australian English, in which the /t/ is tapped

despite not following the above conditions. (Shockey, 2003, p. 30) Whether the exception applies to New Zealand English has not been confirmed nor denied. Although Vaux's definition allows for fairly accurate predictions of tapping, it must be noted that it can also occur after /l/ as well as before a syllabic sonorant. (Boberg, 2015, p. 236) Tapping after /l/ has been shown to be more common in Canadian English. (Brinton & Fee, 2001, p. 428)

The "restrictions on n" mentioned by Vaux (2000, p. 4) refer to the fact that <nt> clusters can lead to several different outcomes. He states that <nt> clusters are separated in three groups. Words such as *winter* or *twenty* lead to t-deletion and the appearance of a nasal tap. Words like *seventy* or *carpenter* lead to a nasal followed by a voiced tap, although they can also be reduced to a single nasal tap in fast speech. Those two groups are distinguished thanks to the following rule: prevocalic t is deleted after n preceded by a stressed vowel. Lastly, tapping is forbidden in words such as *spirantization*, probably because of the relics of a secondary stress on the <i> of the verb *spirantize*. (Vaux, 2000, p. 6) The issues of n-tapping and t-deletion are therefore some of the most complex aspects of tapping.

Tapping is one of the main features of GA, in which some linguists consider it obligatory under normal conditions. (Shockey, 2003, p. 29) It is also found in multiple other dialects, including Irish English, Australian English (Shockey, 2003, p. 29), and even certain casual styles of British dialects (Wells, 1982b, p. 250). It occurs in New Zealand English. (Holmes, 1997, p. 18) Although it is not clear whether tapping is a uniquely American innovation spreading to other parts of the world or independent innovations taking place in several countries, Wells (1982b, p. 250) sees it "as the first distinctively American phonetic innovation likely to spread in time to all accents of English".

As mentioned above, tapping applies to alveolar stops and can therefore occur with /d/. This poses the question of neutralization of /t/ and /d/ in certain environments, as words such as *atom* and *Adam* can become homophonous if both are tapped. According to Wells (1982b, p. 250), tapping applies to /t/ but not to /d/ in some speakers. However, he also states that neutralization seems to be spreading among young American speakers. The question of neutralization in New Zealand English has not been the object of careful studies yet. (Bauer & Warren, 2008, p. 53)

5.2 A Widespread Phenomenon

5.2.1 Tapping in American English

Tapping is widely considered an American innovation, although that view is by no means the only possible explanation for the phenomenon. In American English, it was first attested to in the mid-1930s by several linguists who noted the voiced nature of certain American /t/s. Haugen was the first to posit the existence of a voiced allophone of /t/. Along with John Kenyon, he investigated the resemblance between the allophone and other liquid sonorants, mainly looking at British realizations of /r/. (De Jong, 2011, p. 1) Variability going from [t] through [d] to [ɾ] has long been observed in English thanks to different spellings of the same words (Minkova, 2014, pp. 147–148), which supports Haugen and Kenyon's investigations and could be a factor in explaining the real origin of the innovation. The early descriptions also said tapping to be optional (De Jong, 2011, p. 3), which is interesting given that it is now often described as obligatory under normal conditions. Tapping has indeed become a feature of careful speech in American English and is therefore not limited to conversational styles. (Shockey, 2003, p. 30) Boberg (2015, p. 236) notes that its absence has become perceived as pompous or affected; Wells (1982b, p. 250) argues that it can be seen as artificial, prissy, or effeminate.

The potential neutralization between /t/ and /d/ in contexts favourable to tapping in American English has been the object of much discussion. Some researchers such as Boberg (2015, p. 236) state that for many speakers, the contrast between /t/ and /d/ is neutralized. This results in pairs like *medal* and *metal* being pronounced in similar fashions. According to Wells (1982b, p. 250), the fact that the neutralization of /t/ and /d/ seems to be spreading provides evidence towards it being an American innovation, and a fairly recent one as well. However, some evidence points to the other direction: not only does tapping exist in British English, it might also have been happening since before the colonization of the American continent. It could therefore very well have been exported to America along with the colonists in the 17th century.

5.2.2 Tapping in British English

Tapping in British English is a scarcely discussed phenomenon, mainly because it is widely considered a feature of American speech. Many linguists mention the fact that tapping does occur in at least some British dialects in passing, but it is difficult to find any in-depth studies

of the phenomenon. Wells (1982b, p. 250) states that it can be observed in "certain casual styles in British accents ranging from RP to Cockney". Lindsey (2019, p. 69) describes t-voicing as "an alternative to the glottal replacement of /t/". According to him, it is not a general phenomenon, but it often occurs in frequent words such as *British* and *pretty*. Shockey (2003, p. 30) agrees, stating that Standard Southern British[6] speakers employ [ɾ] occasionally, and especially in frequent words. She notes that tapping is an option for SSB speakers, although glottaling is more frequently chosen. Shockey adds that tapping is not found in Scottish English, which could be due to the fact that the tap can be a realization of /r/ in that dialect. This link between /t/ and /r/ refers us back to the attested variability between /t/, [d], and [ɾ], which could prove instrumental in understanding the appearance of [ɾ] as an allophone of /t/ in so many dialects.

Minkova (2014, p. 148) indeed argues that although tapping is commonly considered an American innovation, many examples of spelling variability in certain words going all the way back to at least Middle English might indicate that the feature was in fact inherited from Britain. For instance, she cites the OE *botm*, with ME alternative spellings ranging from *boddom* to *boden*. Jespersen (2001, p. 139) cites variation going from *pottage* to *porridge* from the early sixteenth century. He also refers to Dickens's spelling of 'never better' *neverberrer*, and several similar examples. According to Minkova, such data shows that tapping is indeed not an American innovation. Other linguists agree with her assessment: Montgomery (2001, p. 139) talks of tapping as "a once general currency in the mother country". Haugen (2012), one of the first to ever write about tapping in American English, makes the same suggestion in 1938. It therefore seems that although tapping has become considered an almost inherently American feature, it takes its roots in the English dialects of the first half of the second millennium. It remains to be discussed whether the spread of the phenomenon to other dialects is similar to its spread in North America and is rooted in early British English, or if the prevalence of the feature in American English has helped or even caused the spread.

Hannisdal (2007) led one of the most thorough investigations of tapping in British English. Her study of RP spoken by television newsreaders focuses on six variables including t-voicing. The results show that 35.2% of all tokens in the study are produced with t-voicing; this indicates the significance of the feature, especially given the level of formality of a news broadcast. (Hannisdal, 2007, p. 186) The study therefore confirms the observations of tapping in British English and shows that it occurs a lot more often than most people would expect.

[6] Modern alternative to RP, used by linguists who view the term as archaic.

Hannisdal also notes that many of her findings are in line with what one would expect of a vernacular variant. T-voicing occurs more frequently in male speech and in less formal registers; it also occurs a lot more word-finally than word-medially, which is further evidence that the change is occurring on a subconscious level. She argues that the change is related to ease of articulation, and concludes that her data supports the claim that tapping in British English is a natural and phonetically motivated sound change. (Hannisdal, 2007, p. 199)

5.2.3 Tapping Around the World

Tapping is a feature of many English dialects around the world. In Australian English, it is generally thought to be more common in Broad AusE but is actually widely used by all categories of speakers. It is in competition with a glottal variant in certain contexts, and tapping appears to be strongly favoured over glottalization. (Horvath, 2008, pp. 100–101) In South African English, Trudgill & Hannah (2008, p. 35) note that there is a tendency to use a tap for /t/ in the usual contexts, although that tendency is nowhere near as strong as in American English. Interestingly, they also note that a flap [ɾ] can be used for /r/, which shows that both allophones can coexist. The variant is also attested to in Irish English, in which /t/ is "not infrequently a voiced tap". (Trudgill & Hannah, 2008, p. 104) Obviously, tapping also occurs in New Zealand English, and the feature will be discussed more in depth in the next part.

Whether or not tapping is an American innovation, it cannot be denied that the spread of the feature to dialects all over the world has coincided with the increase in American soft power. It is therefore easy to understand why the commonly held view posits that the increase in tapping in dialects such as Australian English or South African English is due to the ever-growing influence of American English. The fact that tapping can be found in almost all continents where English is spoken could both speak to the potency of the lenition process behind tapping and the enormous amount of influence that American English enjoys thanks to its cultural near-hegemony. Although that question is a very difficult one to answer, it is certain that solving it would have a considerable impact on the way linguists understand innovations and the power of language hegemony.

6 Tapping in New Zealand English

6.1 A Productive Variant

Although tapping is never described as compulsory in New Zealand English, it remains very frequent. Bauer & Warren (2008, p. 52) note that "[t] is usually voiced and tapped between sonorants", which indicates that we can expect at least a majority of the tokens in suitable contexts to be tapped. It is now always mentioned in general descriptions of NZE phonology, even though it wasn't the case just a few decades ago. For instance, Wells (1982a) describes tapping in AusE but fails to mention it in NZE. In 1997, Holmes (1997, p. 19) notes that several of her studies have demonstrated that tapping is far more frequent among younger speakers, and is as frequent as 82% of tokens for young working class men. Tapping is therefore a very productive variant, and it seems to be on its way to becoming compulsory in NZE as in American English. According to Holmes (1997, p. 19), the voiced variant is "steadily displacing" the original aspirated variant. Her study of the ONZE corpus has shown that the change has been underway for quite some time. (Holmes, 1994) The general assumption that tapping is quite a recent change in NZE therefore seems to be unfounded and it is more likely that the tap variant has been replacing the conservative aspirated variant slowly but surely since the beginning of the 20th century.

The first person to publish a study on tapping in NZE was Allan Bell. (Bell, 1977, 1982, 1984; Bell & Holmes, 1990) He was interested in the way news presenters adapted their style to their audience, and t-voicing was one of the variables used in those audience design studies. He found that t-voicing was used significantly more when the audience was less prestigious, for example on a local channel. (Bell, 1982) Even though tapping was not the specific goal of the studies, Bell was therefore the first to provide data on its occurrence in NZE.

The most exhaustive study of tapping in NZE was led by Holmes (1994). She studied the phenomenon quantitatively using the Wellington Corpus of Spoken New Zealand English[7] (see 8.1 below) and looked at three different conversational speech styles. The conclusion of her study is that tapping in NZE follows the usual pattern of vernacular variants. Her data shows that it is more common in younger people's speech, in men's speech and in working class people's speech; it is also more frequent in less formal styles. She does note that young middle-class women have a similar tapping frequency to young working-class men. Young middle-

[7] https://www.wgtn.ac.nz/lals/resources/corpora-default/corpora-wsc

class women would therefore be the conduits of the vernacular change into the middle-class, but it could also have other implications. I will come back to that element in the next part.

Holmes (1994, p. 221) also provides some insight into the linguistic constraints on tapping in NZE. She notes that tapping is favoured between vowels of different stress and disfavoured between stressed vowels. She also indicates that the likelihood of tapping is increased after short vowels. According to her, the most influential linguistic constraint is word position: tapping is much more likely to happen when the /t/ is word-final as opposed to word-medial. She concludes that t-tapping is very likely to keep spreading in NZE, and that the next generation could see it becoming semi-categorical in everyday conversation. (Holmes, 1994, p. 222)

A few phonologists have noted that a glottal variant might have started to replace the tap. (Bauer & Warren, 2008, p. 53) That is interesting since it would suggest that British English still has a significant influence over NZE. For now, there is little evidence that tapping will disappear from NZE anytime soon. Indeed, the glottal replacement seems to be a lot more common word-finally. (Bayard, 1990) That glottal variant has however also been noticed in Australian English, which could indicate that NZE is undergoing a similar process. Nevertheless, it remains less frequent than the tap. (Horvath, 2008, p. 100)

Tapping has become an important part of NZE phonology and its study could lead to valuable findings. Several linguists have thus been interested in understanding the origin of the change, socially, phonologically, and geographically.

6.2 A Change From Below?

Definitions

According to sociolinguistics, language change can occur in two different directions. It can happen below the level of conscious awareness, in which case the change is called 'change from below'. People can also be aware of the change; in that case, the change is deemed 'change from above'. (Holmes, 2013, pp. 209–210) Both types of language change seem to be involved to some extent in the development of the tap variant in New Zealand English. I will therefore discuss both types of change, both generally and in relation to tapping in NZE.

Changes from below can also be called vernacular changes. They happen below the level of conscious awareness, which means that the speakers leading the sound change are not doing it on purpose. The name also refers to the fact that changes from below tend to start in lower

socio-economic classes and make their way up the social ladder[8]. Vernacular changes are typically started by working-class men. Although the use of vernacular forms does not follow the norms considered most prestigious, it allows the speakers to seek a different type of prestige: covert prestige. In short, people who use vernacular forms do so in order to associate with a certain community; even though those forms are not considered desirable by society at large, they allow some groups of speakers to identify with a certain sub-culture and show a sense of belonging. Vernacular changes can also happen for articulatory reasons: for instance, /f/ and /v/ are easier to pronounce than /θ/ and /ð/, which might explain the vernacular change going from the latter to the former in British English. Linguistic processes such as changes due to ease of articulation therefore also play a role. (Holmes, 2013, p. 211) Determining whether tapping in NZE is a vernacular change would thus be useful in evaluating the extent of American influence on NZE as well as the type of prestige that American English enjoys in New Zealand.

Changes from above are also called prestige changes. They happen above the level of conscious awareness, and the speakers are therefore consciously adopting prestigious pronunciations. They often start among women of higher socio-economic classes and subsequently spread to other groups. It is easy to understand why a feature seen as prestigious would be adopted by many speakers and therefore spread easily through a community. Speakers therefore use a more prestigious pronunciation consciously in order to identify themselves with more prestigious groups. (Holmes, 2013, p. 209) In order to determine whether tapping in New Zealand could originate in a prestige change, it is useful to look at whether working-class men or middle-class women are leading the sound change. Attitudinal studies could also be helpful, as they allow us to establish whether American accents are considered prestigious in New Zealand.

New Zealand English

At first glance, tapping very much seems to have entered NZE through a vernacular change. Indeed, Janet Holmes's studies show that working-class men have much higher rates of t-voicing than other groups. This indicates that tapping originates in a change from below and has been progressively spreading to other groups in New Zealand. As mentioned above, Allan Bell's early studies on the matter have shown that at the time, t-voicing was used a lot more by

[8] Although those two definitions often work together, it should be reminded that some sound changes can come from lower socio-economic classes and be conscious; similarly, a sound change can be subconscious and come from higher socio-economic classes.

TV newscasters on channels with less well-educated audiences. Similarly, the percentage of t-voicing in more professional and 'serious' broadcasts was a lot lower. (Bell, 1977) Holmes also indicates that the often expressed negative attitudes towards tapping show that the phenomenon is indeed far outside of the prestigious norm. (Holmes, 1997, p. 19) Hay et al. (2008, p. 38) make the same observation more than ten years later, noting that flaps are still looked down upon and that older people deplore younger people's tendency to "adopt an American accent". All those elements point toward the fact that tapping in NZE definitely started as a vernacular change. It still remains to be determined whether that change from below was due to a natural phonological process going towards ease of articulation (which is the hypothesis brought forth by Holmes) or if American English already had significant covert prestige that working-class New Zealanders wished to identify with. For instance, certain occurrences of rhoticity in NZE have seemed to point towards hip-hop music (see 2.2.1), which originates in the United States and generally is associated with a sub-group who definitely enjoys covert prestige. A similar phenomenon could have been going on with tapping.

Even though tapping in NZE started out as a vernacular change, it also appears to show certain characteristics which are usually associated with changes from above. First, as seen in the previous chapter (see 3.3.2), New Zealanders' attitudes towards American accents are changing. Bayard (2001) shows that American English not only seems to no longer be looked down upon by New Zealanders, but that it actually enjoys a significant amount of prestige, both in terms of power-associated traits and in terms of solidarity-associated traits. This is the first hint that tapping might no longer be stigmatized in New Zealand, and might have become a signifier of out-group prestige instead. Holmes (1997, p. 19) adds that young middle class women use the feature much more than young men. According to her, those elements indicate that although tapping started as a vernacular change, the recent modification in attitudes to American accents have introduced a concurrent change from above, which would support and accelerate the relatively natural change from below.

Holmes's hypothesis seems to hold a lot of weight, as it would explain the incredible spread of tapping around the world. Such expansion of a single feature into nearly all dialects of English is indeed very rare; the powerful concurrent forces of natural sound change and cultural and linguistic hegemony would therefore make very good culprits.

6.3 Unanswered Questions

Although a significant amount of studies have been conducted on tapping in NZE, a number of questions remain unanswered. For instance, the exact conditions under which tapping happens are still not fully understood. Furthermore, there have not been any thorough studies trying to establish the conditions for tapping specifically in NZE[9]. Unfortunately, due to the complexity of the theoretical work needed to answer those questions as well as the limitations of the corpus used in this paper, I will not try to address them.

The change from the voiceless alveolar stop to the tap variant is still undergoing, and it would therefore be interesting to look at the generational differences in order to establish whether it is approaching completion. The potential replacement of tapping by a glottal allophone has also been raised in several papers, and looking at the extent of that replacement might provide answers. This paper will therefore look at the frequency of taps in various categories of speakers and compare it to the frequency of the original aspirated variant as well as the glottal stop. This will allow me to determine whether the trend that has been observed in most of the studies on tapping in NZE is upheld by the speakers of the PAC corpus.

The question of the origins of the sound change is still undergoing, although it will be very difficult to find a definitive answer. Nevertheless, the more data we have on tapping in NZE, the closer we will be to understanding the reasons for the change and the forces at play in the evolution of NZE. This paper will therefore contribute by adding to the conversation.

Lastly, the question of the potential neutralization of /t/ and /d/ when tapped has not been the object of any thorough study in NZE. However, investigating that question will also prove fairly complex given the scope of this study and the limitations of the corpus.

Those unanswered questions clearly show that tapping in NZE could be a very fruitful area of research. This paper will therefore try to address a few of them and hopefully reach some interesting conclusions.

[9] Bauer & Holmes (1996) do look at the constraints on the realizations of /t/ in their 1996 paper.

7 Summary

This chapter has allowed me to show that tapping is a fascinating linguistic phenomenon and a very productive area of research, particularly in New Zealand English where it has not been investigated as much as in other dialects. I have provided a detailed, although non-exhaustive description of tapping and of the main studies that have investigated it. The aim of this chapter was to offer an overview of the social and linguistic processes that might affect and be affected by tapping as well as to highlight the questions which have not yet been answered by the linguistic community. The following chapter will therefore examine the data from an oral corpus in order to study tapping in New Zealand English and try to understand it as in depth as possible. A better understanding of tapping in New Zealand English will hopefully lead to a better understanding of New Zealand English in general and of the forces that influence its evolution.

Chapter 3: Corpus, Methodology and Results

This chapter will explain my investigation of tapping in New Zealand English, from the choice of corpus to the results and their analysis. I will describe the methodology used for the study and discuss the findings in light of the first two theoretical chapters.

8 Corpus Selection and Description

In the first chapter, I discussed the extreme geographical isolation of New Zealand. Although that isolation works out in our favour in the sense that it makes NZE a fascinating linguistic object, it also makes it extremely difficult for foreign linguists to do fieldwork in New Zealand. Rather than making my own recordings, I have therefore chosen to select an existing corpus for this study.

8.1 Why the PAC corpus?

As mentioned before, there are many existing corpora of NZE. It is indeed the only native variety of English whose very first speakers have been recorded, and corpora spanning decades and decades of NZE speech are therefore commonly used by phonologists. The ONZE project[10], based in the Linguistics department of the University of Canterbury in Christchurch, is probably the best-known set of corpora of NZE and has been widely used for many studies. The Wellington Corpus of Spoken New Zealand English[11] is based in the linguistics department at Victoria University of Wellington, and is also used by many NZE researchers. It is coordinated by Janet Holmes, who is responsible for many of the existing studies on tapping in NZE. The ICE (International Corpus of English) New Zealand corpus is the last major corpus used by linguists studying NZE. It consists in both spoken and written corpora and is also coordinated by the linguistics department at Victoria University of Wellington.

Many different corpora are therefore available to study NZE and they present a lot of advantages. However, given that tapping is a phenomenon that has already been studied using several of the corpora cited above, I have found more interesting to use a corpus in which tapping has never been investigated. Since the study of tapping in NZE is still quite recent, any additional data on the phenomenon is beneficial to its understanding. Even though the few

[10] https://www.canterbury.ac.nz/nzilbb/research/onze/
[11] https://www.wgtn.ac.nz/lals/resources/corpora-default/corpora-wsc

studies that have been made on tapping seem to go in a similar general direction, more data is needed in order to determine whether the findings truly hold up. Using a new corpus will therefore add to the conversation and provide more data on tapping in NZE.

It also needs to be noted that most of the corpora cited above gathered their data more than twenty years ago. Tapping is still a change in progress, and using more recent data therefore seems more interesting in order to assess the advancement of the change. Using a recent corpus allows this study to act as a follow-up on most of the studies on tapping in NZE.

The PAC programme[12] gathers multiple oral corpora from all over the world. Although it is also used to study things like syntax and L2 acquisition, its main intent is to build phonological corpora for the different varieties of English. According to the PAC website, its aims (Carr et al., 2004) can be summarized as follows:

- to give a better picture of spoken English in its unity and diversity (geographical, social and stylistic) on the basis of native and learner corpora;
- to test existing theoretical models in phonology, phonetics and sociolinguistics from a synchronic and diachronic point of view, making room for the systematic study of variation;
- to favour communication between specialists in speech, phonological and sociolinguistic theory;
- and to provide corpus-based data and analyses which will help improve the teaching of English as a foreign language.

The PAC programme amounts to roughly 130 hours of recordings with 259 speakers in 9 different countries, which makes it a fairly wide-ranging set of corpora of English. It also follows a strict protocol made of the retrieving of much information about the speakers and which includes several tasks, which will be described in more detail in 8.2.2. This strict protocol is shared by all PAC fieldworkers, which allows all the PAC corpora to be used comparatively to one another. The PAC corpora are therefore perfect for phonological variation studies.

The New Zealand sub-corpus of the PAC programme was recorded by Cécile Viollain in 2010 as part of her PhD work. Three sub-corpora were recorded: 17 speakers in Dunedin, 6 speakers in Wellington, and 6 speakers in Christchurch. Only the Dunedin sub-corpus was used in Viollain (2014), and the other two have still not been used in any published study. The data from the Christchurch and Wellington sub-corpora was therefore completely raw and unedited,

[12] https://www.pacprogramme.net/

and consisted in roughly an hour of recording per speaker. Thanks to Cécile Viollain who kindly accepted to lend me those two sub-corpora, I have been able to use them for this investigation of tapping in NZE.

The Christchurch and Wellington PAC sub-corpora are particularly interesting for this study. First, since Wellington is on the North Island and Christchurch on the South Island and since neither is known for a particular dialect, they allow for the study of New Zealand speech in general as opposed to speech from a very specific region. I will be able to verify whether tapping really does occur at similar rates in different parts of the country, and if it does, the study will be able to be applied to the whole of NZE. As all PAC corpora, the Christchurch and Wellington sub-corpora include several different tasks at different levels of speech formality, including interviews, word lists, and a text. That is particularly interesting to study tapping; indeed, since the change is supposedly still in progress, the different tasks will allow me to assess how advanced it is. Parts of the PAC word lists and of the text are also specifically designed to check for the presence or the absence of tapping. (Carr et al., 2004, p. 6) Lastly, the recordings were made in 2010, which makes them some of the most recent recordings involved in a study of tapping in NZE. The data obtained will therefore be more current than that of most similar studies.

8.2 Description of the Data Used

The data in the Christchurch and Wellington sub-corpora was recorded by Cécile Viollain in December 2010, following the strict protocol of the PAC programme. Speakers were selected using networks of acquaintances, which allowed the speakers to be somewhat familiar with the fieldworker and therefore to be able to behave more comfortably and naturally during the interviews. (Viollain, 2014, p. 352) Given that the two sub-corpora will be treated jointly in the study, I have decided to treat them jointly in the description of their speakers as well.

8.2.1 Speakers

There are six speakers in the Christchurch sub-corpus, and another six in the Wellington sub-corpus. A total of twelve speakers was therefore considered in this study. The PAC programme criteria state that a corpus must have a minimum of 12 speakers to be valid, and considering both sub-corpora together therefore allows me to reach that threshold. The speakers will be designated by their initials followed by a number, in accordance with the PAC conventions.

Eight of the speakers are women, and four are men. Although those numbers are far from being balanced, it is still significant to have several speakers of each gender, which is not always manageable. Viollain (2014, p. 352) notes that women are often more eager to participate in linguistic studies than men, which might explain this disparity. The Christchurch and Wellington sub-corpora are therefore more balanced in terms of gender than many other corpora in the PAC programme (see PAC Lancashire in Navarro (2013): 9 women and 1 man).

The corpus was divided in three age groups: younger speakers, middle-aged speakers, and older speakers. The three young speakers were all 19 years old at the time of the recording. The middle-aged speakers ranged from 27 years old to 38 years old, and the older speakers were between 54 and 61 years old. Although those categories are quite arbitrary and do not correspond to the usual ages designated by the words 'old' or middle-aged', they were the most logical way to divide the speakers into age groups. The table below sums up the gender and age repartition of the speakers:

Gender/Age	Young (under 20)	Middle-aged (27 to 38)	Old (54+)	Total
Women	2	1	5	**8**
Men	1	3	0	**4**
Total	**3**	**4**	**5**	**12**

Table 8.1: Repartition of speakers according to gender and age

All of the speakers were born in New Zealand and spent the majority of their life in New Zealand, although not necessarily in the city in which they were recorded. Most of their parents were also born in New Zealand, apart from AF1's mother who was born in the Netherlands but emigrated to New Zealand when she was 11 years old. The speakers are therefore all very suitable for a study on NZE.

All speakers in the corpus can be said to be middle class or even upper middle class. All are university educated (except for JD1 who is taking a gap year before going to university), and all adult speakers as well as most of the speakers' parents have middle class occupations. It is famously difficult for linguistics fieldworkers to constitute balanced corpora on a socioeconomic level, as working class speakers are typically not part of the networks used by academics. It is also understandable that someone who has gone to university and carried out similar studies would be more willing to participate in one. This corpus is not an exception, and is therefore fairly homogeneous in terms of the socioeconomic profile of its speakers. This

means that the study will not be able to look at social class comparatively, or at least not with a quantitative approach.

It also must be noted that a significant portion of the speakers have worked as a teacher at some point in their life (7 out of 12, or 58%). Two others are studying speech and language therapy. Two speakers hold PhDs, including one in linguistics for MR1. One speaker is a travel agent and four (33%) have lived abroad for at least a year. All those elements mean that the speakers are overall very linguistically conscious. It is very visible in the recordings: several speakers, aware that the object of the study is New Zealand English, try to explain some accent-related phenomena to the fieldworker, for instance the perception of New Zealand accents abroad or the difference between New Zealand and Australian dialects. The PAC protocol does a good job of trying to control linguistic awareness by having the speakers perform several different tasks, but the fact that a good amount of the interviews is specifically about the way New Zealanders speak remains noteworthy.

Lastly, most speakers in the corpus are Pakeha, that is to say they are the descendants of white immigrants. However, EH1's father is Maori, and EH1 is very involved in Maori culture: he actually teaches *Te Reo Maori* for a living. Given that we only have one Maori representative in the corpus, I will not be able to directly attribute potential differences between EH1 and other speakers to his ethnicity and culture. However, it will be an interesting factor to keep in mind.

8.2.2 Tasks

The PAC protocol consists in four distinct tasks that all speakers normally need to complete to be considered in the final version of a corpus. Those tasks are the reading of two word lists, the reading of a text, a formal interview and an informal conversation. This allows researchers to have access to a spectrum of various speech styles, going from very speech-conscious and formal to relaxed and informal.

The informal conversation takes place between the informant and a friend or a member of their family, so as to record very spontaneous and casual speech. As only two speakers in the Christchurch and Wellington sub-corpora recorded informal conversations, I have decided to exclude this task from the study. Two speakers is indeed too few to be able to extract enough information for a quantitative analysis. Focusing on only three levels of speech formality will also be more suitable for the scope of this paper and will thus allow me to dig a bit deeper in the analysis of the data.

The formal interview consists in a conversation between the informant and the fieldworker. These interviews are both meant to gather data of a certain speech style (more formal than the informal conversation, less formal than the readings) and to collect background information on the speakers. These conversations are therefore based on a specific questionnaire whose questions touch on the speaker's language, their identity, their work, and the area they live in. They are meant to allow the fieldworker to fill in the information sheets which constitute an integral part of the PAC protocol and which distinguish it from other sets of corpora. Indeed, collecting specific information about the informant's language abilities, socioeconomic background, travel history, and ethnic and linguistic origins is what makes the PAC programme so interesting for the study of phonological variation, as information about all the factors that could explain certain phonological phenomena is available to the researcher. Although the formal interviews in our corpus do collect this type of information, they remain more similar to an actual conversation that one might have with a stranger encountered in a semi-professional setting than to an actual formal interview. The fact that the interviews show this back and forth movement between the fieldworker and the informant is encouraging, as it suggests that the language recorded is probably fairly similar to the language they use in their day-to-day life. The PAC protocol suggests that a minimum of five minutes of each formal interview should be transcribed and used. Since tapping happens in a fairly common phonetic environment, I have chosen to transcribe and analyse five minutes of conversation for each speaker, as that is largely sufficient to get a significant amount of tokens.

The second task that I have chosen to analyse consists in the reading of a text. The text was taken from a newspaper article and largely edited, so as to erase its source and to make it more propitious to certain phonological processes. (Viollain, 2014, p. 316) It is partly meant to examine the pronunciation of /t/s, both in terms of tapping and glottaling. The environments in which tapping might happen are mainly set across word boundaries. The text along with my underlining of the contexts suitable for tapping are featured below:

Christmas interview of a television evangelist

If television evangelists are anything like the rest of us, all they really want to do in Christmas week is snap at their families, criticize their friends and make their neighbours' children cry by glaring at them over the garden fence. Yet society expects them to be as jovial and beaming as they are for the other fifty-one weeks of the year. If anything, more so.

Take the Reverend Peter 'Pete' Smith, the 'TV vicar' who sends out press releases in which he describes himself as 'the man who has captured the spirit of the age'. Before our nine a.m. meeting at his 'media office' on Crawshaw Avenue, South London, he faced, he says, a real dilemma. Should he make an effort 'to behave like a Christian'-throw his door open, offer me a cup of tea-or should he just play it cool, study his fingernails in a manner that showed bored indifference and get rid of me as quickly as possible? In the end, he did neither.

'As a matter of fact, John', he says in a loud Estuary English twang, 'St Francis said, 'At all times preach the gospel and speak whenever you have to'. But hey, he didn't mean 'Be on your best behaviour and be happy all the time'. I could have been extra-polite to you, but the real me would have come out as I was talking. You cannot disguise what you are.' 'And what are you then, Pete?'

'Well, I'm a Christian, John. I've been one since I was fourteen. And I know for sure that Christianity will be judged more on who you are rather than what you have to say about it. Many church leaders don't appear to understand this. They think we can only be really Christian when we are ramming the doctrine of the Creation down people's throats. But if you try to force-feed people they get sick of it and think you're a pain. It's seen as the job of a Christian leader to wear a dog-collar and dress in purple and always be talking about the real meaning of the New Testament. In reality, that turns people right off!'

In many ways, 'Pete' Smith looks exactly how you'd expect a high-profile, born-again Christian to look: tall, handsome, clean-cut and evenly sun-tanned. He has those scarily white teeth that TV evangelists tend to have, and he doesn't wear a dog-collar. In fact, when doing his various religious programmes on Sunday mornings, he has been known to wear a black leather jacket instead, in casual mode. Today, the look is more business-like: metalrimmed glasses, a grey suit, a blue open-neck shirt, and fashionable black shoes with large buckles. Smith is forty-four but he looks a mere twenty-four.

During the whole interview, there wasn't any talk of the poor or the needy but only of his forthcoming trip to China in February and the masses waiting for his message there. I ventured a few questions relating to the charity trust he founded some ten years ago and which, it is generally agreed, employs eight hundred staff and runs schools, hospitals and hostels around the world. And what about the gambling organization he has been willing to advise? Is that a temporary activity or might it be true that he has accepted to be paid to sit on its Board of Directors? Which side is religion on these days? Does money matter? It was as if I had launched a few missiles in his direction. He just sighed in answer: 'I'm only human, John. God knows I do my best and often fail, But it's no skin off my nose if our enemies sneer at some of the good work we do. Truth will out.'

Table 8.2: Text from the 2010 PAC protocol

The underlined environments were first chosen after several readings of the text. However, they are only indicative as the reading style can affect whether the environment could potentially lead to tapping. For example, in the third paragraph, some speakers marked a pause between "come out" and "as I was talking". This inherently prevents the possibility of tapping. Similarly, some speakers had difficulties with the reading and marked pauses that are not required grammatically, which led to the disappearance of some additional environments for some speakers. I wanted to include my designation of all the potential environments for tapping nonetheless, as I believe that they showcase the richness of the text and the intentionality behind every single detail of the PAC protocol.

The third and last task used in this study is the reading of a word list. The PAC protocol contains two word lists that allow the researcher to focus on different processes: the first word list focuses on vowels and the second word list on consonants. For obvious reasons, I will only be concerned with the second word list, which is featured below:

1. pat	18. rum	35. rubber	52. lap
2. bat	19. run	36. little	53. lab
3. tuck	20. rung	37. middle	54. sack
4. duck	21. lack	38. metal	55. sag
5. carter	22. rack	39. meddle	56. belly
6. garter	23. wet	40. bicker	57. berry
7. fan	24. yet	41. bigger	58. bell
8. van	25. witch	42. degree	59. bet
9. this	26. which	43. decree	60. chutney
10. thick	27. lock	44. betting	61. kidney
11. seal	28. loch	45. bedding	62. grace
12. zeal	29. earthy	46. written	63. graze
13. bishop	30. worthy	47. ridden	64. behave
14. leisure	31. sinner	48. singer	65. anyhow
15. heart	32. simmer	49. stronger	
16. batch	33. singer	50. fat	
17. badge	34. supper	51. fad	

Table 8.3: Word list 2 from the 2010 PAC protocol

The words *carter, garter, little, metal, betting* and *written* all offer perfect environments for tapping. Additionally, some of them form a minimal pair with words which have a /d/ instead of a /t/. This is particularly convenient to study the potential neutralization between those two phonemes when both are tapped. The PAC protocol also requires speakers to read the number out loud before reading the word. That decision proves very helpful: the stigmatization of features such as tapping leads speakers to be very conscious of them while they read the words, but they might not pay as much attention when reading the numbers. (Carr et al., 2004, p. 7) All numbers going from 30 to 49 are therefore very useful when studying tapping. This is verifiable in this corpus since as we will see, there are virtually no examples of tapping in the word lists except in the numbers, which are tapped fairly often by a significant number of speakers. Once again, this showcases the intentionality behind the details of the PAC protocol, which allows for its corpora to provide as much information to researchers as possible.

9 Methodology

The PAC programme works with several software tools meant to automate as much of the researcher's job as possible. This part will therefore give an overview of those tools and of the methods used to transcribe and annotate the data prior to analysis.

9.1 Transcription

Transcription is a necessary step for the researcher, as it is needed in order to be able to annotate and analyse the data properly. The PAC programme chooses to require an orthographic transcription, as opposed to a phonemic or phonetic transcription. All interviews and conversations must therefore be transcribed using a Standard Orthographic Transcription. The first reason for that choice is the fact that phonetic and phonemic transcriptions are inherently very subjective.

It would be difficult to find two phoneticians who would transcribe a recording in the exact same way, and that would be incompatible with one of the main goals of the PAC programme: obtaining comparable data for different varieties of English. Transcribing phonetically would also mean that before even starting the analysis of the data, the researcher would be confronted to many complex issues in the representation of various sounds, and a mistake could potentially jeopardize the rest of the study. A precise phonetic transcription would therefore not be suitable.

Similarly, a phonemic transcription would come with issues: since one of the goals of the PAC programme is to describe the phonemic system of different varieties of English, settling on a phonemic description for the transcription would imply that the phonemic system of the variety is already known. The conclusions of a study might bring the researcher to have to modify their understanding of the phonemic system of the variety, and the transcription would thus not make much sense.

Lastly, the PAC programme is not only meant to be used by researchers who have an intimate knowledge of phonemic and phonetic symbols. An orthographic transcription allows all researchers to use the data, no matter their field of specialization.

All those reasons make an orthographic transcription the most suitable choice for the PAC corpora. It also must be noted that transcribing orthographically is the easiest and fastest method out of the three, which is non-negligible as the transcription and annotation of an oral corpus is extremely time-consuming. It also is the most neutral and the most likely to prevent mistakes, as standard English is much easier to master than the International Phonetic Alphabet.

The transcriptions of PAC corpora must be compatible with the tools used by the programme, such as SPPAS. The transcription protocol must therefore be followed as strictly as possible for the resulting file to work smoothly with the various software packages. The transcription conventions of the PAC protocol are featured below:

PAC TRANSCRIPTION CONVENTIONS DIGEST © PAC 2020

Category	Type	Transcribed	Example
Punctuation	full stop ("final" intonation contour)	**.**	*I was born in 1977.*
	comma (brief pause or "continuing" intonation)	**,**	*I was, I think, maybe 13 or 14.*
	question mark (at the end of a question)	**?**	*How old were you then?*
Numbers	1977	**in numbers**	*I was born in 1977.*
	29 (not pronounced as expected)	**in letters**	*twenty nine, foul. 30, foil. 31, furl. 32, bird.*
Disfluencies	fillers (GB)	**er**	*Er, let's see, er, I er, I'm from Paris.*
	fillers (USA)	**uh**	*Uh, let's see, uh, I uh, I'm from Paris.*
	truncated words	**trunc- truncated**	*I made a mis- mis- mistake. I shouldn't have call- called her.*
Proper name	proper name (for anonymization)	**$name$**	*His name is $John Smith$.*
Acronyms	UNESCO /juːˈneskəʊ/	**UNESCO**	*UNESCO is part of the United Nations.*
	U S A /juː es ˈeɪ /	**U_S_A**	*I'd love to visit the U_S_A.*
Specific pronunciation	mispronunciation	**[standard, faked]**	*I'm going to [Sheffield, Sheffle].*
Foreign words	foreign words	**normal spelling**	*We will spend 3 days in Zhangjiajie and Fenghuang.*
Reductions and elisions	contracted forms	**I have/I've**	*I have heard that and also I've heard that…*
	missing phonemes	**(be)cause**	*I won't make it (be)cause I'm busy that day.*
	missing words	**ø**	*Was she there? Think so.* (**NOT** *I think so* or *(I) think so*)
	yeah	**yeah**	*Yes, yes, I know. Yeah, you're right.*
Reported speech	reported speech	**§quote§**	*when Bush said §read my lips no new taxes§ and then…*
Laughter	laughter	**text @ text**	*It's impossible @.*
	laughter while speaking	**@@ text @@**	*It's @@ impossible @@.*
Pauses	short pause	**+**	*I see that + you're happy.*
	short pause	**,**	*I was, I think, maybe 13 or 14.*
Noises and incomprehensible sequences	noise	*****	*My father, he is from Canada. * He was born in 1935.*
	unintelligible syllable	*** (X)**	*because not *(X) all the cases are uh, show up.*
	two unintelligible syllables	*** (XX)**	*I used to listen to B_B_C news and *(XX) news.*
Comments	comments from the transcriber	**{comment}**	*My father, he is from Canada. *{door opens, F returns} He was born in 1935.*

Table 9.1: PAC Transcription conventions

9.1.1 SPPAS

SPPAS (Bigi, 2015) is a phonetization and alignment software package used by the PAC programme in order to automate part of the annotation process. It is compatible with PRAAT (Boersma & Weenink, 2021) and the annotations created with either tool can therefore be opened and modified with the other. Within the PAC programme, SPPAS is mainly used prior to the transcription, in order to create speech intervals in an annotation file automatically.

The 2020 PAC protocol requires an Inter Pausal Units (IPUs) search to be performed through SPPAS before starting the transcription. This allows the transcription file to be segmented automatically which makes it quicker and easier to perform the rest of the transcription work manually.

In order to perform an IPU search through SPPAS, it is first necessary to add the desired sound file in the 'files' section of SPPAS. The search then needs to be configured in the 'annotate' section, which appears in the screenshot below. In step 1, the output file format must be set to TextGrid in order for the file to be opened in PRAAT. In step 2, the language must be set to English. In step 3, the researcher has to select 'standalone annotations' and 'search for IPUs'. The parameters of the search can be modified: I have found that the minimum duration of a silence must be increased from 0.2 to 0.6 when performing the search on a conversation in order for the IPUs to be of a reasonable length. For the text, 0.4 is sufficient. It does not need to be modified when performing the search on the reading of a word list.

After modifying all the settings needed, the search is performed thanks to the "Let's go!" button. Although a report is available directly in SPPAS, the output file can be found saved next to the original sound file in the computer automatically.

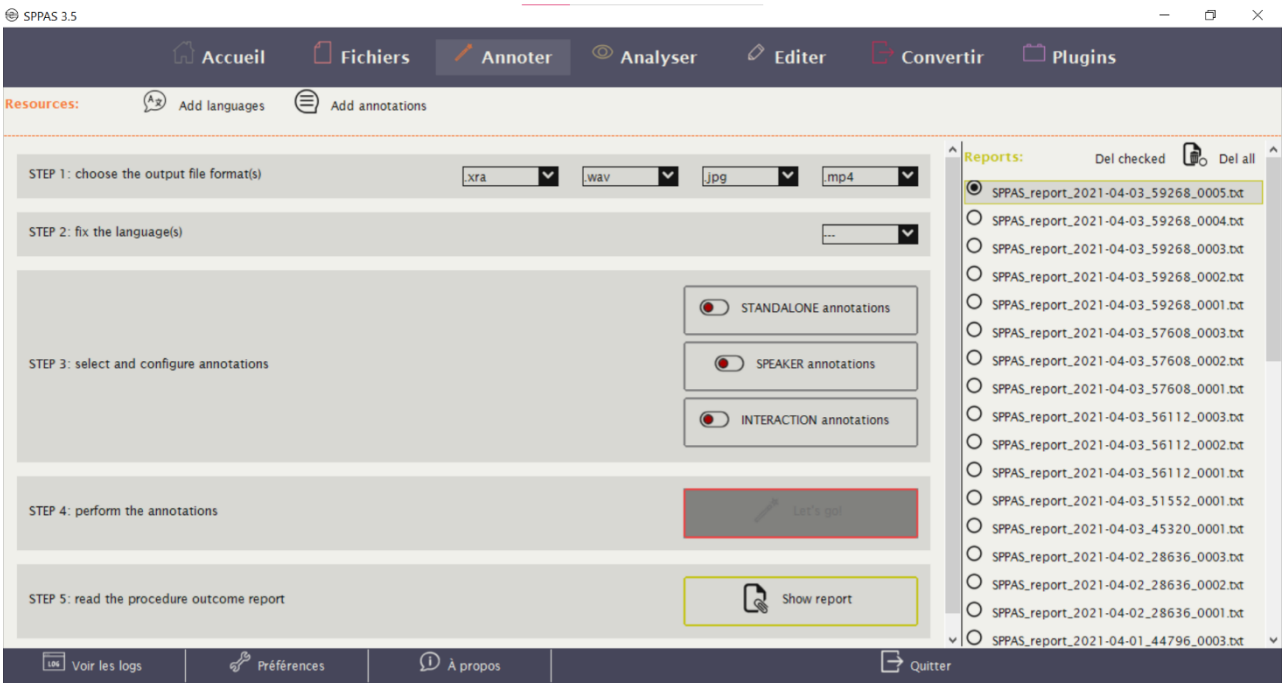


Figure 9.1: Annotate section in SPPAS

Once the automatic IPUs search is performed, the TextGrid file is ready for the transcription, which can be performed either through SPPAS or through PRAAT. It must be noted that the IPU boundaries need to be checked manually during the transcription. The following image is a screenshot of a Textgrid file opened in PRAAT after an IPU search. The symbol # stands for a pause or a silence.

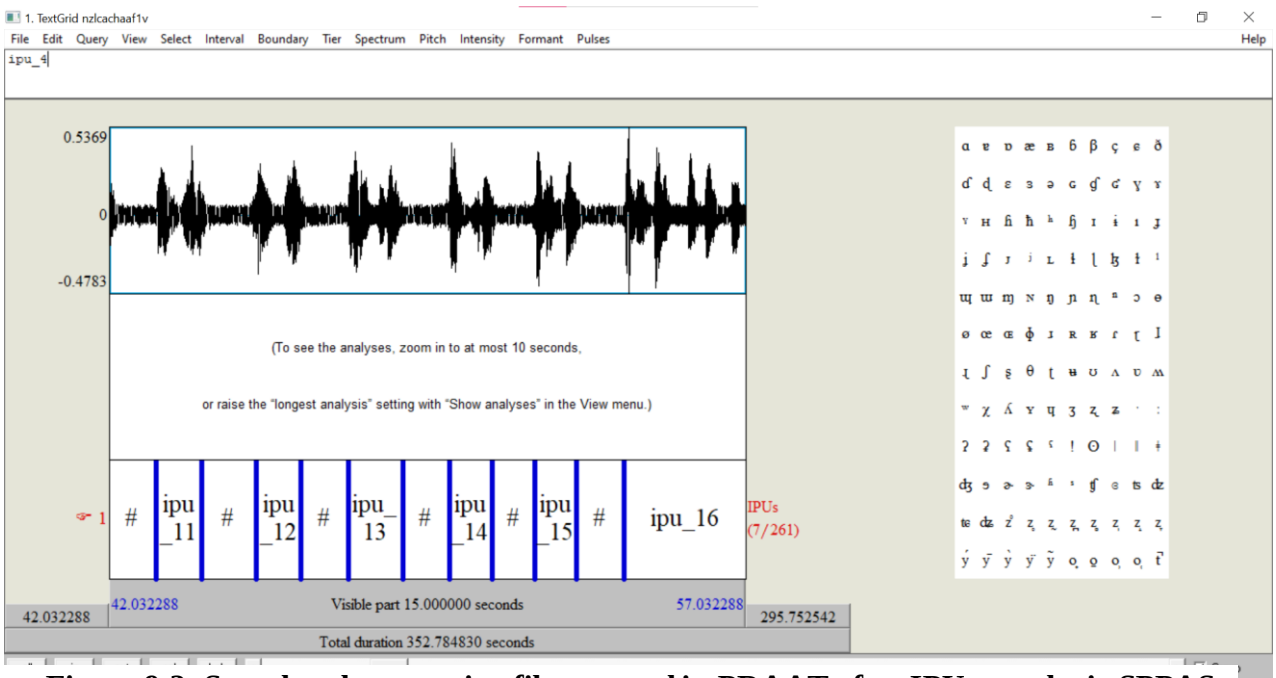


Figure 9.2: Sound and annotation files opened in PRAAT after IPU search via SPPAS

9.1.2 PRAAT

PRAAT (Boersma & Weenink, 2021) is a computer programme designed to analyse speech. It is widely used by linguists all over the world and presents numerous advantages, such as its very wide range of uses or the fact that it is free to download. Its near monopoly in the linguistic world also means that many sources helping with the manipulation of the software package are available online, such as the tutorial available directly on the PRAAT website[13]. I will therefore not describe the many uses that can be made of the computer programme.

In this study, I mainly used PRAAT for its annotation functions. PRAAT offers a very straightforward and intuitive interface which allows for a smooth experience in the transcription of a sound file. It works with a system of tiers. The PAC protocol requires the first tier to be named 'Trans' in order for it to be able to be phonetized and aligned by SPPAS. In the 2020 version of the protocol, each speaker needs to be on a different tier for similar reasons. The second tier is named 'F', for fieldworker. For the coding, the researcher must duplicate the first tier and place it in third position; that third tier is usually named after the phenomenon studied. An example of the different tiers can be seen in the screenshot below:

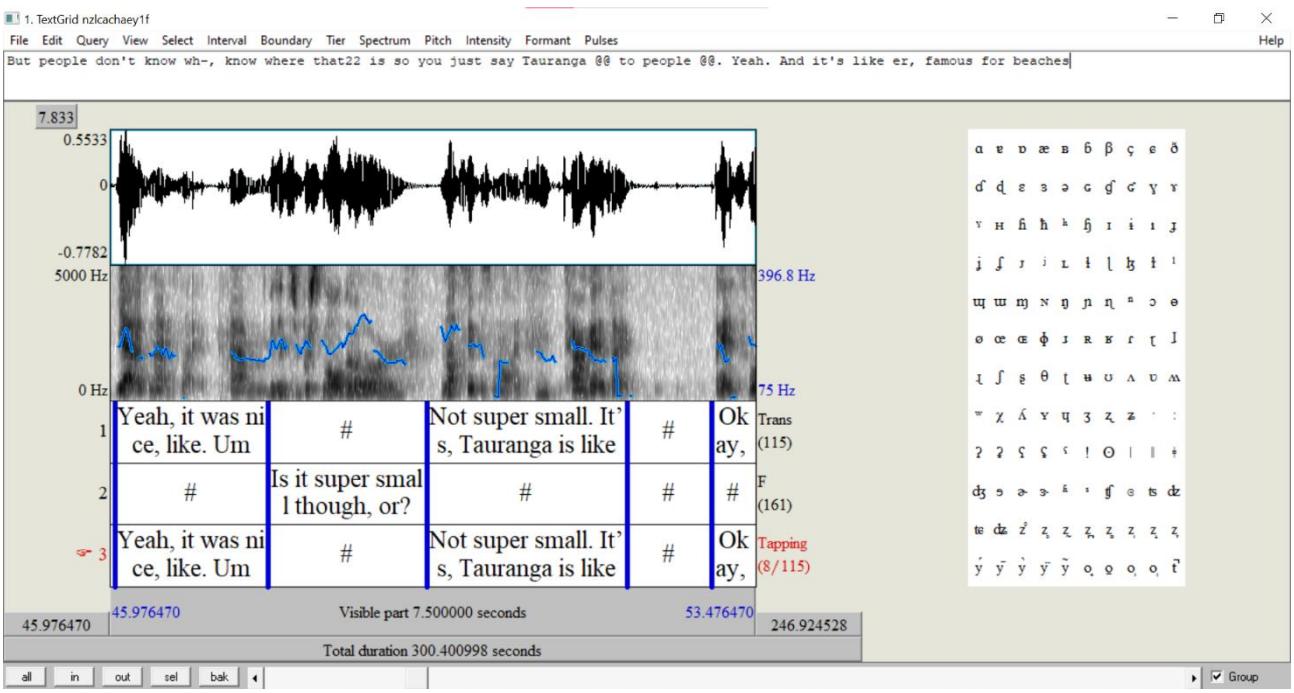


Figure 9.3: Tier system in PRAAT

[13] https://www.fon.hum.uva.nl/praat/

The boundaries which are created automatically by SPPAS can be moved manually in PRAAT to fit the audio better. PRAAT thus provides an extremely convenient environment for the transcription of the corpus, which is reinforced by its seamless compatibility with the other software packages used in this study.

9.2 Coding and Data Analysis

Transcribing an oral corpus is often the first significant step in a phonological study. However, once the transcription is complete, the researcher must find a way to extract the data of interest in order to analyse it. The techniques used depend on the phonological process under study. For instance, vowels are non-discrete variables. They exist on a spectrum and are defined by specific values called formants. Those values must therefore be extracted and plotted in order for them to be analysed. On the other hand, consonants are often considered discrete, even though that is a simplification of reality. Most phonologists therefore listen to the consonant of interest and decide what the variant produced is out of a list of several possible phonetic realisations. Those realisations are given alphanumeric values which are added to the transcription in order for the data to be easily extracted. Since t-tapping is a consonantal phenomenon, we can consider it to be discrete. I have therefore chosen to use alphanumeric coding in this study.

In order to determine the environments which should be coded, I have decided to follow Vaux's definition which was given earlier in this paper: /t/s will therefore be coded when they occur "after a sonorant other than l, m, or ŋ, but with restrictions on n; before an unstressed vowel within words, or before any vowel across a word boundary; when not in foot-initial position" (Vaux, 2000, p. 4). Due to the theoretical complexities which would come with including nasal taps following /n/, I have chosen to exclude them from this study.

9.2.1 Coding

When establishing a coding technique, the researcher must keep in mind the variables that are being investigated while keeping the coding simple in order for the data to be easily extracted. This study has a fairly small scope and is only looking into a few variables; the coding was therefore kept very simple. I decided to focus on two levels of coding, the first one being the /t/ variant realised by the speaker and the second one being whether the /t/ is positioned within a word or across word boundaries.

In English, an inter-vocalic (or inter-sonorant) /t/ can either be realized as an aspirated stop, a tap, or a glottal stop. Those different realisations were therefore reflected as first level variables in the coding. Since the realisation is sometimes unclear, a fourth option was added in order to be able to reflect that. The second level of coding was kept very simple, as it is simply meant to identify the position of the /t/. The only two possibilities are within a word or across word boundaries. To sum up, the resulting coding looks like this:

First Level:

1: /t/ realised as an aspirated stop

2: /t/ realised as a tap

3: /t/ realised as a glottal stop

4: Unclear realisation

Second Level:

1: Within a word

2: Across word boundaries

This coding method therefore only extracts very limited data, but it allows for an interesting quantitative and statistical approach of the variant. It will therefore be very useful in evaluating the extent to which each speaker taps their /t/s and the environment in which they do so the most. The screenshot below shows an example of two coded environments: one is an example of a glottal stop across word boundaries, and the second one is a tap across word boundaries.

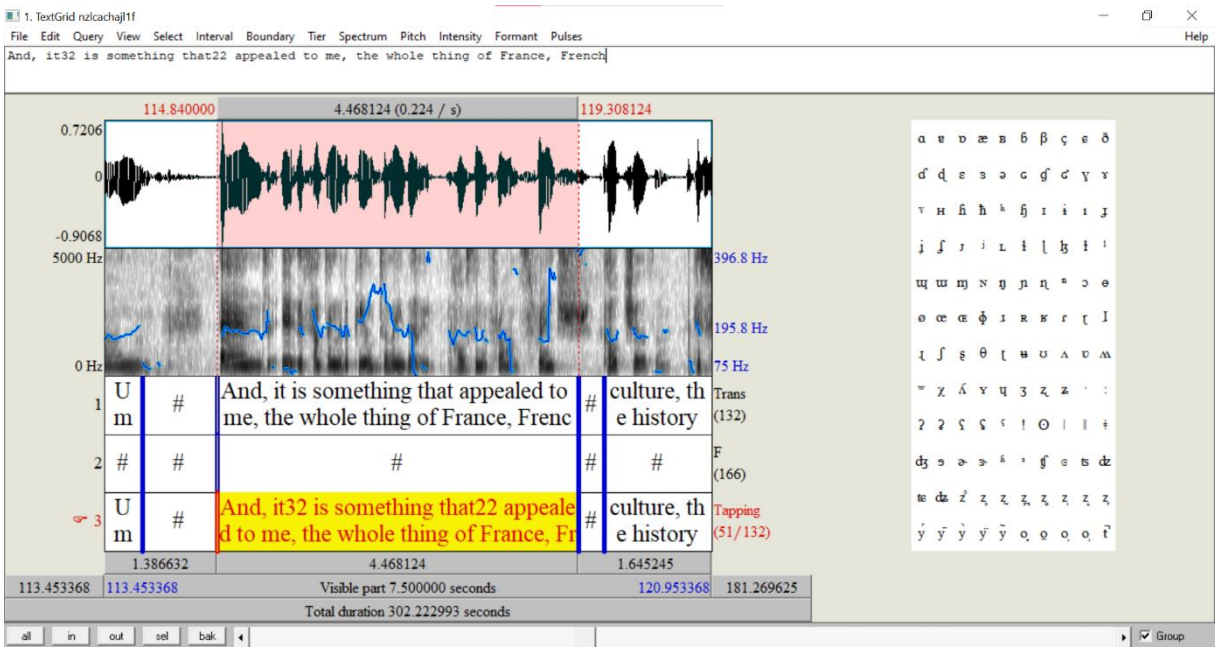


Figure 9.4: Example of coded /t/s in PRAAT

The coding is done by ear and is therefore subject to a certain amount of subjectivity, which could lead to a significant number of mistakes and affect the results of the study. However, the presence of an option for unclear tokens mitigates that effect. Doing the coding over PRAAT also allows the researcher to have access to the sound wave and the spectrogram, which can help identify the variant. The screenshot below features an aspirated variant of /t/: the stop and the aspirated release are very visible in the middle of the spectrogram, and would be absent if the variant produced was a tap. I therefore used this method when the variant did not clearly belong in any category. If it was still unclear after spectrogram analysis, the 'unclear realisation' coding was used.

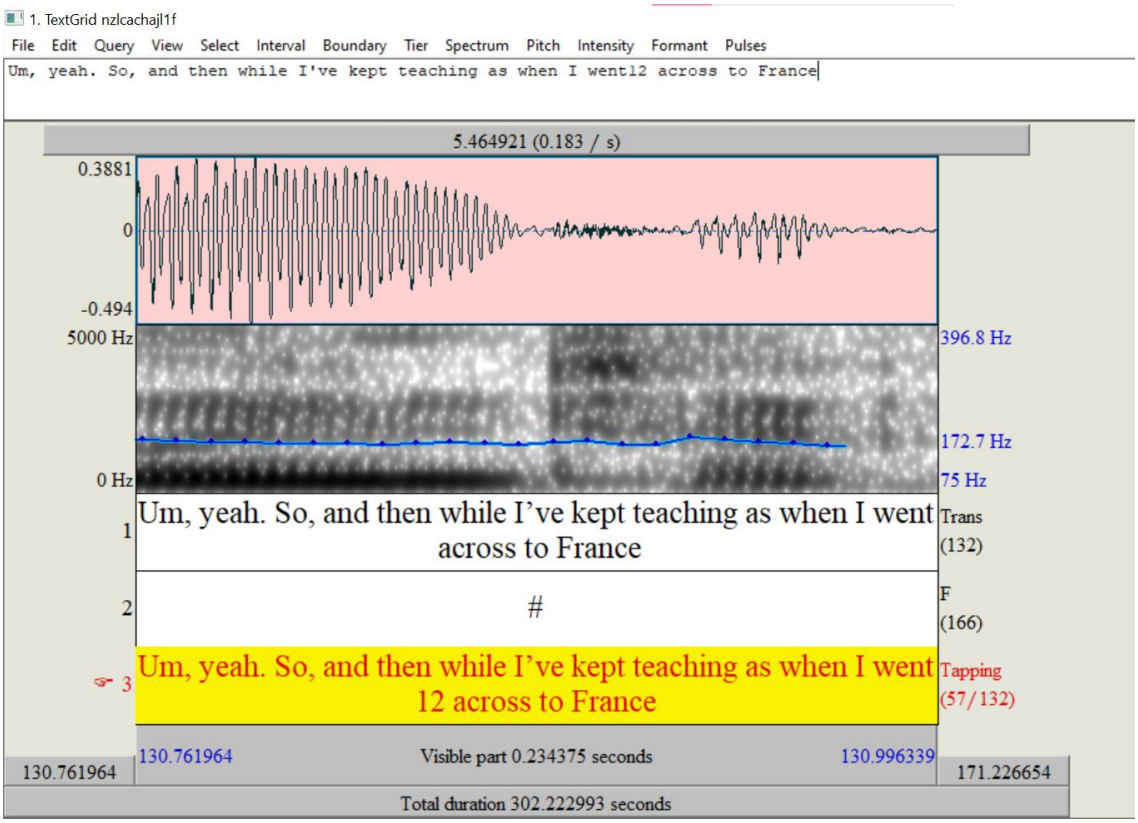


Figure 9.5: Example of an aspirated stop on PRAAT

This type of coding is called alphanumeric because in order for it to work, it must be placed directly after the <t> in question. In order to find all occurrences of a tapped /t/ within word boundaries, the researcher would therefore have to look for occurrences of "t21". This allows us to keep regular numbers from being included in the results of the queries. I am now going to describe the method used to extract this alphanumeric coding more in detail.

9.2.2 PHONOMETRICA

Phonometrica[14] (Eychenne & Courdès-Murphy, 2019) is another software package used by the PAC programme. It was developed specifically for the PAC and PFC (Phonology of Contemporary French) programmes. It is the new version of DOLMEN, which is a very similar computer programme made by the same developers. Phonometrica is a free, open-source software platform and therefore offers many benefits to researchers. Its main use is to organise and extract data from oral corpora. Phonometrica's main features are listed on its website:

[14] Available for download at http://www.phonometrica-ling.org/#id1

- Project management: organize files into projects.
- Sound visualization and annotation: visualize and annotate speech sounds on multiple layers
- Extensible metadata: annotate files with properties, which allow you to sort and organize your corpus.
- Queries: build and save simple or complex queries; search strings or patterns across layers.
- Data analysis: hypothesis testing, linear, logistic and Poisson regression
- Scripting engine: Phonometrica can be configured and extended with an easy-to-use scripting language and JSON files.
- Standard-based: Phonometrica files are encoded in XML and Unicode.
- Interaction with Praat: Phonometrica can read and write TextGrid files and open files directly in Praat.

For this study, I used the first four features listed. The ability to interact with PRAAT was also extremely convenient. Phonometrica's user interface allows the researcher to visualize their project more easily and to organize their files as they please. It is extremely important for corresponding sound and TextGrid files to have the exact same name (with a different extension) in order to facilitate their binding. Binding is necessary because it allows the user to be able to view the sound wave and the annotations, as it lets the software package know the files are supposed to work together. Phonometrica binds corresponding sound and annotation files automatically when they have similar names, which can save a lot of time. However, the binding can also be done manually if the files have to have different names.

The adding of properties is also extremely convenient. A property is the association of a category and a value. The user has complete control over what properties they add to a file: for instance, the category can be set to speaker, gender, task, and anything else that might be needed for the study. The user can then add a certain value to the file for each category; in the case of the aforementioned categories, those values could be AF1, male and word list. Once again, the user can set those values to anything they want. Properties are extremely useful to extract the data, as they make the query process a lot faster. The PAC programme plugin, which can be added to Phonometrica, allows for those properties to be added automatically, provided the file names strictly follow the PAC protocol. The screenshot below shows the main Phonometrica interface, with the project files on the left and an example of a file with properties on the right:

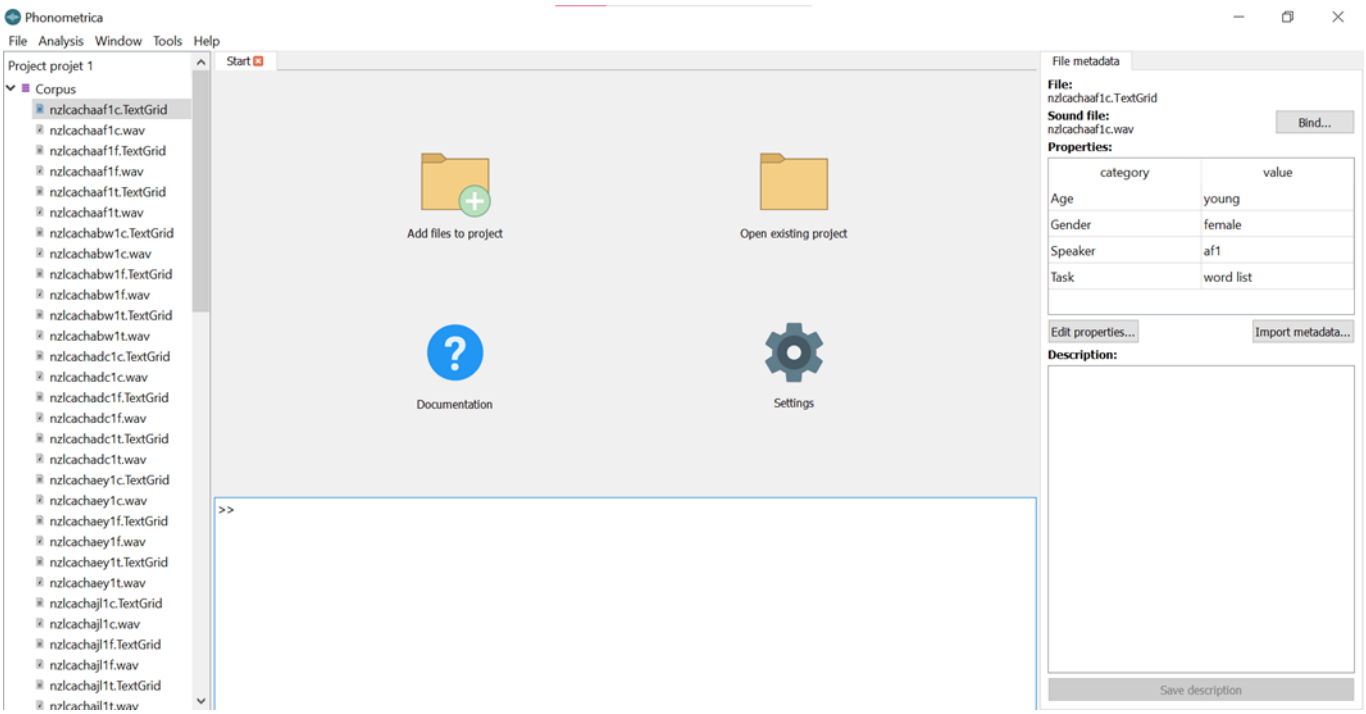


Figure 9.6: Phonometrica user interface

Once the files have been bound and the properties have been added, the coded data can be extracted thanks to the "Queries" section in Phonometrica. A query can be made by clicking 'analysis' and 'search annotations'. The query page opens, and the researcher can choose what match pattern or text string they want to search for. In this case, I could type 't22' in the search box. The researcher can also either select the individual files from which they want to extract the data, or use the properties to select the files. For instance, I could search for tapped variants across word boundaries only in the interviews of middle-aged women. A picture of the query box in Phonometrica can be seen below:

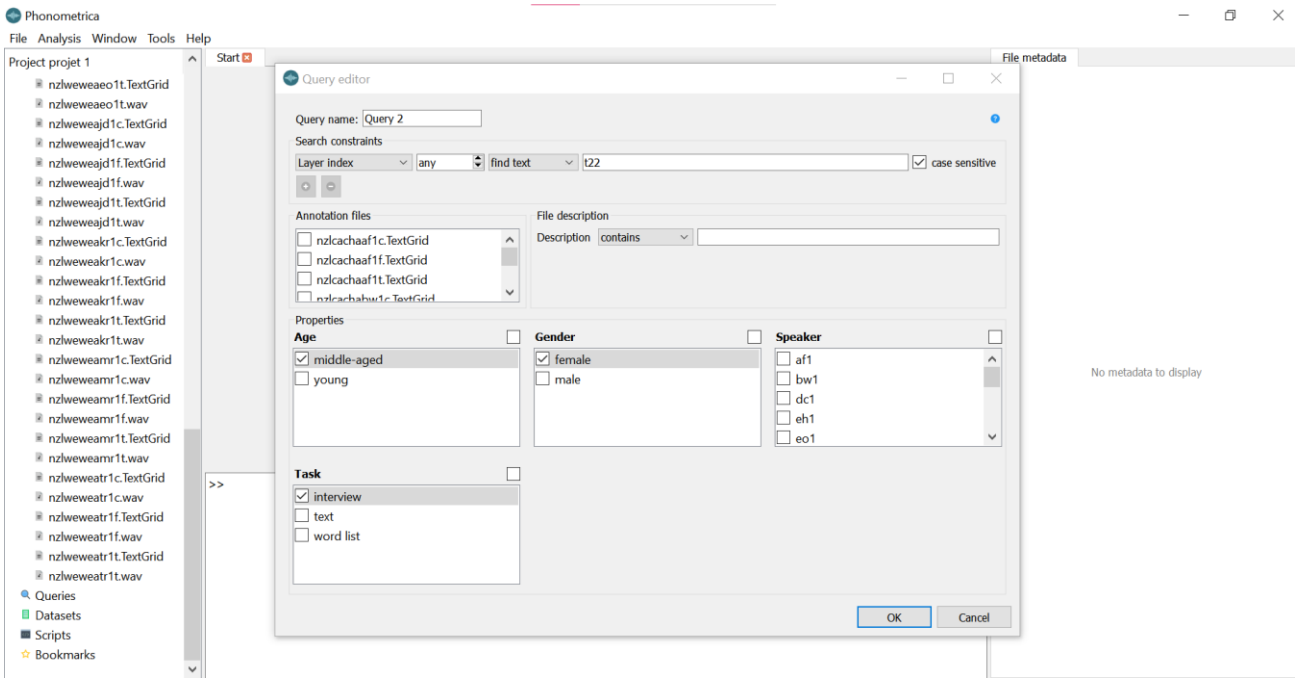


Figure 9.7: Phonometrica query box

When a query is made, Phonometrica selects the occurrences of a coding which correspond to all of the criteria set in the query. It displays them in a list and shows the number of matches, the left and the right context, as well as the number of the tier (layer) and the start and end time of the match in the file. The screenshot below shows the result of the example previously described:

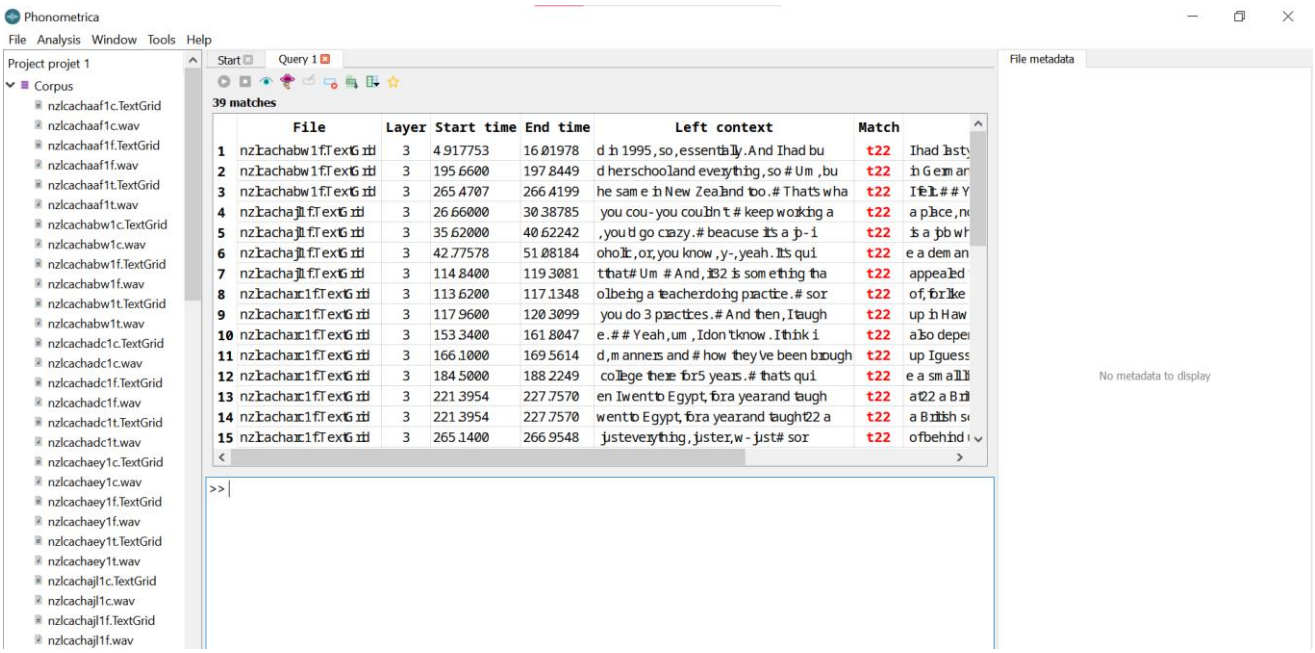


Figure 9.8: Results of a query in Phonometrica

Phonometrica is therefore extremely useful in extracting the coded data. Using it is a tremendous time gain, as it automates much of the work which used to be done by hand.

9.3 Objectives of Present Study

Although the objectives of the present study have been hinted at by the literature review I have provided on tapping in New Zealand English, I would like to go back to them briefly before discussing the results.

We have established that although several quantitative studies have been led on tapping in New Zealand English, the corpora used in those studies are now over twenty years old. The first objective of this study is therefore to build on the findings from previous studies by assessing the frequency of tapping in NZE with a more recent corpus. I will therefore evaluate the prevalence of the tapped, glottal and aspirated variants overall in order to determine their popularity in current New Zealand speech.

The frequency of each variant also needs to be estimated among groups of speakers in order to try and replicate the Holmes (1997) findings. The sociolinguistic variables such as gender and age can be very important, as they can help in understanding the sound change better. I will therefore try to determine whether men still use more taps than women, and whether young people still use more taps than older speakers.

I will also evaluate the prevalence of each variant in the different tasks in order to see whether speech style still affects the amount of taps produced. Just as the gender and age variables, the level of formality of the task can help assess the advancement and the origin of the sound change in question. I will therefore look at the amount of taps produced overall in each of the three tasks.

Lastly, the environment in which tapping happens will be investigated. I will look at whether tapping happens more within or across word boundaries. This will allow us to examine the impact that word position has on this sound change so as to provide more data on the origins of the change.

Before extracting the results from the data, it was my intention to do an acoustic comparison of tapped /t/ and tapped /d/ in order to establish whether there is a difference between them. The minimal pairs provided in the PAC word list are indeed perfectly fit for such a study. However, as we will see in the next part, the tapping in the reading of the word list was very minimal, and there are not enough tokens to carry out such a comparison.

10 Results

This section gives the results of the quantitative analysis of tapping in our corpus. I will first present the results for the frequency of tapping overall. I will then look at the frequency of tapping depending on social factors (age and gender), speech style (word list, text and interview), and linguistic factors (word position).

10.1 Frequency of Tapping

This analysis identified three possible realisations of /t/ in the environments prone to tapping: a voiceless aspirated stop, a voiced tap, and a glottal stop. The realisations which were too ambiguous to be classified were labelled 'unclear' and were included in most tables and graphs for the sake of transparency.

A total of 886 tokens were analysed; each speaker produced 74 tokens on average. The aspirated stop was the most frequent realisation by far and represents 59% of tokens. 36% of tokens were tapped. This figure could be considered low, given that 60% of all tokens were voiced in Holmes (1994). However, it needs to be kept in mind that Holmes's study only included conversational styles. The inclusion of very formal and speech-conscious styles like the reading of a word list are expected to bring down the total number of tapped tokens. 36% is therefore a fairly high score for the tapped variant. The table below shows the specific figures for each variant.

Variant	Aspirated Stop	Tap	Glottal stop	Unclear	Total
Tokens	520	319	38	9	886
Percentage	59%	36%	4%	1%	100%

Table 10.1: Overall scores

The figure below provides a better visualization of the repartition of the variants. The aspirated stop and the tap are clearly the most popular realisations by far, and the glottal variant is rare. Although it is not the most frequent variant, the tap (shown in grey) represents a very sizable proportion of tokens.

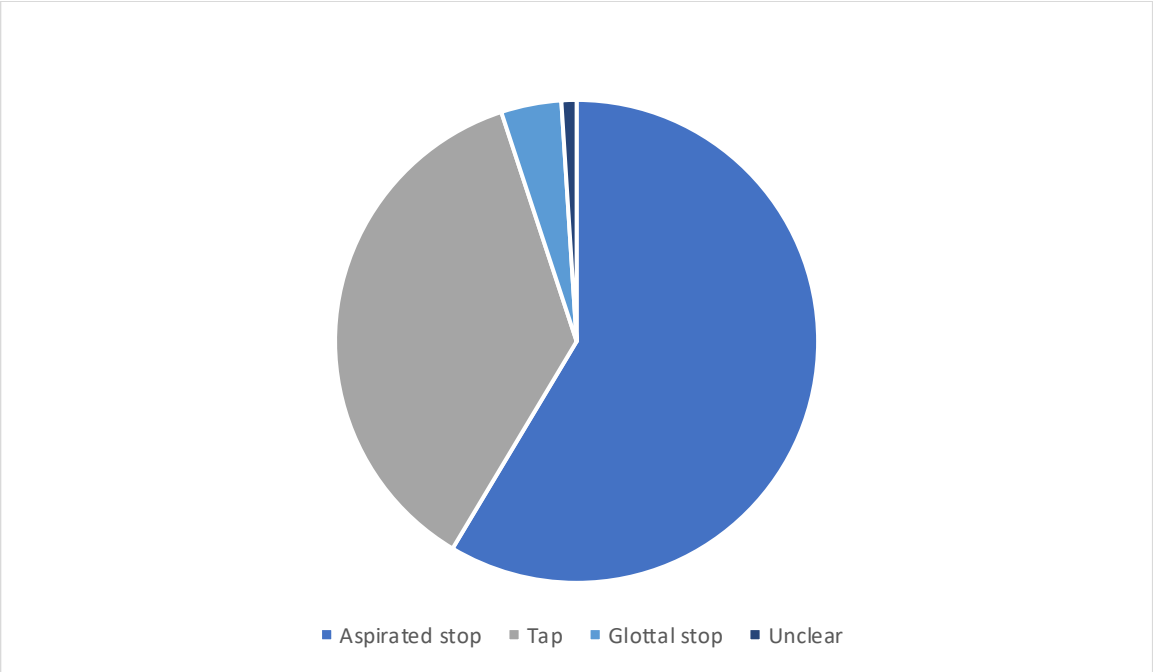


Figure 10.1: Repartition of each variant

The table below shows the individual percentage scores of each variant for each speaker. The high level of inter-speaker variation is plain to see, as the scores for tapped realisations range from 13% to 68%. Tapping is clearly part of the inventory of all the speakers in the corpus, even though the scores vary. Similarly, voiceless aspirated realisations go from 29% to 83%. The distribution is therefore very different depending on the speaker. The glottal stop score is also a source of variation between speakers: it goes from 0% (one speaker produced no glottal stops) to as high as 12% of tokens. Contrary to tapping, glottaling is thus not part of the inventory of all of the speakers.

Speaker/Variant	Aspirated stop	Tap	Glottal stop	Unclear
AF1	71%	**20%**	8%	1%
BW1	80%	**14%**	3%	3%
DC1	48%	**45%**	4%	3%
EY1	46%	**42%**	12%	0%
JL1	83%	**15%**	1%	1%
RC1	43%	**47%**	10%	0%
EH1	29%	**68%**	3%	0%
EO1	53%	**46%**	1%	0%
JD1	43%	**54%**	3%	0%
KR1	75%	**23%**	0%	1%
MR1	81%	**13%**	4%	1%
TR1	52%	**44%**	3%	2%

Table 10.2: Individual speaker scores

In order for the results of this study to be comparable to others, I decided to include the overall and individual percentage scores of each variant taken exclusively from the interview. Those results will be easier to assess when contrasted with results from other studies, as conversational styles are used far more often in studies of tapping in NZE. It must be kept in mind that the percentage frequencies below are calculated from a relatively small number of tokens (20 tokens per speaker on average). They are therefore less meaningful than the frequencies extracted from all three tasks.

Variant	Aspirated stop	Tap	Glottal Stop	Unclear	Total
Tokens	82	136	22	3	243
Percentage	34%	56%	9%	1%	100%

Table 10.3: Overall scores in formal interview

Speaker/Variant	Aspirated stop	Tap	Glottal stop	Unclear
AF1	24%	**56%**	16%	4%
BW1	61%	**27%**	4%	8%
DC1	29%	**57%**	14%	0%
EY1	0%	**85%**	15%	0%
JL1	69%	**25%**	6%	0%
RC1	12%	**60%**	28%	0%
EH1	28%	**68%**	4%	0%
EO1	37%	**63%**	0%	0%
JD1	0%	**93%**	7%	0%
KR1	50%	**50%**	0%	0%
MR1	64%	**29%**	7%	0%
TR1	17%	**75%**	8%	0%

Table 10.4: Individual speaker scores in formal interview

The formal interview scores are visibly more similar to the scores found in previous studies. 56% of all tokens were tapped, which is very close to Holmes's 60%. The difference in styles does still have to be considered since part of Holmes's data was from conversations between peers which are much less formal than an interview by a stranger. The glottal stop scores are also much higher than in the overall scores, and one speaker uses them as much as 28% of the time.

In the next sections, I will attempt to explain the high levels of inter-speaker variation by examining the results in terms of age and gender, which are sociolinguistic factors responsible for much of language variation.

10.2 Sociolinguistic Variables

The sociolinguistic factors I will take into account in this study are age and gender. Indeed, several studies of tapping in New Zealand English have found that those variables factor into the repartition of the different variants. It would also have been interesting to take the socioeconomic status of the speakers into account; however, since the inter-speaker socioeconomic variation in the PAC corpus is fairly low, it will not be considered in this study.

The values used to compare the variant repartition in different groups of speakers were number of tokens, percentage frequency, mean and standard deviation. The mean simply represents the average of the individual percentage scores. The standard deviation is used to indicate the way the values are distributed around the mean. A large standard deviation indicates that the distribution is wide or that there are outliers; a low standard deviation means that the values are fairly close to the mean. N stands for the sample size, that is to say the number of speakers in the group.

10.2.1 Age

As expected, younger speakers tended to produce less voiceless and more voiced tokens than older speakers. However, the middle-aged speakers surprisingly used the tapped variant a lot more than the young speakers. The table below shows the number of tokens for each variant in each group of speakers, and the graph shows the percentage frequency of each variant in all three age groups:

Age/Variant	Aspirated stop	Tap	Glottal stop	Unclear	Total	N
Young	117	81	16	1	215	3
Middle-aged	126	153	15	3	297	4
Old	277	85	7	5	374	5

Table 10.5: Number of tokens for each variant according to age

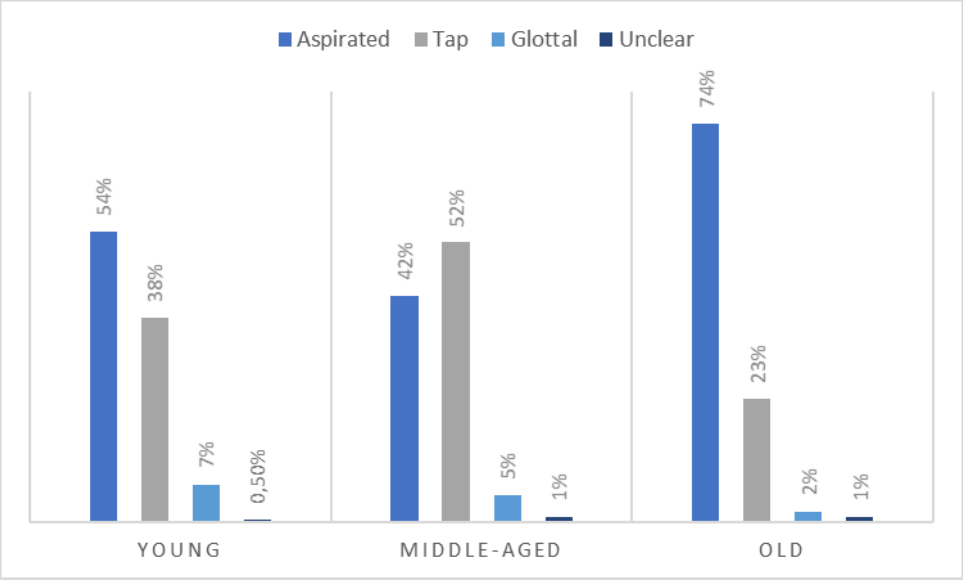


Figure 10.2: Variant repartition in percentage according to age

Middle-aged speakers are the only ones for whom the tapped variant is used more often than the aspirated variant. Young speakers are in the middle, and older speakers clearly use a lot more aspirated stops. Those results are very surprising as up until now, all studies of tapping in NZE have found that young speakers use more taps than older speakers.

Holmes's study (1994, p. 205) uses a binary distinction between young and middle-aged speakers. She finds that 66% of realisations among young speakers are tapped, as opposed to only 50% among middle-aged speakers[15]. Given that the study was led in 1994, the PAC middle-aged speakers were probably born in the same period as her young speakers. Similarly, the PAC older speakers are roughly part of the same generation as her middle-aged speakers. The results of this study are therefore consistent with Holmes's. However, the new generation of speakers investigated (people born at the beginning of the 1990s) seems to be displaying a completely new trend in the realisation of their /t/s.

The fact that younger speakers use taps less often than their middle-aged counterparts indicates a deceleration in the spread of the tapped variant. This could be a first sign showing that we may be approaching the end of the sound change. If this trend holds, the percentage frequency of taps will stabilise. The table below shows the mean scores for both age groups:

Age	Mean	N	Standard deviation
Young	39%	3	17,243356
Middle-aged	51%	4	11,401754
Old	22%	5	13,881643
Total	36%	12	18,163191

Table 10.6: Tapping: mean scores for age

These results must be mitigated by the fact that there is significant inter-speaker variation, particularly among the young speakers. The standard deviation is very high in the young group, and the high amount of variation is also visible when we look at the individual scores: AF1's tapping frequency is 20%, while EY1's is 42% and JD1's 54%. The mean is therefore not completely representative, as the scores are very widely distributed.

Since the results were so surprising, I extracted the data from the formal interview alone. Even though the number of tokens is lower and the means are therefore less representative, they

[15] The figures themselves are not comparable; Holmes is only investigating conversational styles. My inclusion of reading styles in the study significantly lowers the tapping frequency.

are also easier to compare to Holmes's data. The table below shows the tapping mean scores for age in the formal interview:

Age	Mean	N	Standard Deviation
Young	78%	3	19.467922
Middle-aged	65%	4	8.124038
Old	39%	5	16.858232
Total	57%	12	22.005509

Table 10.7: Tapping: mean scores for age in formal interview

The data from the formal interview is a lot more consistent with previous studies than the overall data. In the formal interview, the young speakers used significantly more taps than the middle-aged speakers, as expected. It is interesting that the inclusion of reading tasks would change the overall trends so much. The younger speakers who are just out of high school might have been more careful with the reading tasks and might have altered their speech more significantly. The middle-aged speakers might have been more comfortable and less careful with the reading tasks, which would explain the change in trends. It is interesting to notice that EH1, the speaker who has the highest overall tapping frequency (68%), has the exact same tapping frequency when only taking the formal interview into account. He seems not to have been affected by the style changes at all.

The scores from the formal interview clearly show that younger speakers are not tapping less than middle-aged speakers, at least not in conversation. They indicate that the overall scores might be affected by the different generations' different attitudes towards tasks such as reading the word list or the text.

Finally, glottal stop frequency is also interesting, as younger speakers produce more tokens than middle-aged speakers who produce more tokens than older speakers. Even though the score is still low, it is clear that glottaling is steadily becoming part of the repertoire of young NZE speakers.

Age	Mean	N	Standard deviation
Young	8%	3	4.509249
Middle-aged	5%	4	3.366502
Old	2%	5	1.643168
Total	4%	12	3.725425

Table 10.8: Glottaling: mean scores for age

10.2.2 Gender

In my description of tapping in New Zealand English, I mentioned Holmes's investigation of tapping frequency according to gender and social class. According to her, young working class men and young middle class women tended to use taps a lot more than other groups of speakers. (Holmes, 1997, p. 19) Given that the speakers in this study are overwhelmingly middle class, it is interesting to find that men used the tap variant significantly more than women. Taps are men's preferred variant, whereas women use aspirated stops 38% more than taps. This could be a sign that tapping is indeed a subconscious vernacular change, and that it is reaching the middle class through men. The table below shows the number of tokens for each variant in each group of speakers, and the graph shows the percentage frequency of each variant in both genders:

Gender/Variant	Aspirated stop	Tap	Glottal stop	Unclear	Total	N
Women	398	166	29	6	599	8
Men	122	153	9	3	287	4

Table 10.9: Number of tokens for each variant according to gender

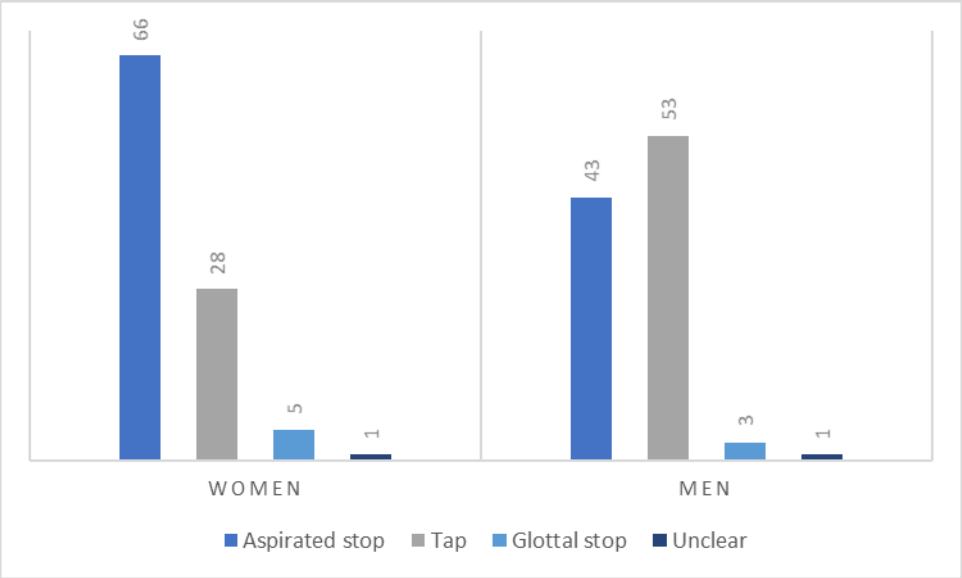


Figure 10.3: Variant repartition in percentage according to gender

The table below shows the means of tapping frequency for women, for men, and in general. It is immediately obvious that men use taps much more often than women with an average frequency of 53%. However, when we look at the individual speaker data, only two out of four men use taps more often than aspirated stops. The mean is driven up by the high tap frequency of EH1, who uses the voiced variant 68% of the time. The lowest male tapping frequency is TR1 with 44%. EH1's high tapping frequency is probably affected by other factors. The main factor singling him out is the fact that EH1 is half Maori, but it is impossible to assess whether his culture and ethnicity could play a part in his variant distribution.

The female data is even more spread out than the male data: the woman who taps the least does it 13% of the time and the highest female tapping frequency is 47%. It also has a higher standard deviation than the male data. Female tap production thus seems to be notably affected by other variables. However, since the total standard deviation is much higher than both the male and the female standard deviation, gender is clearly an important factor.

Gender	Mean	N	Standard deviation
Women	28%	8	14.918828
Men	53%	4	11.116804
Total	36%	12	18.163191

Table 10.10: Tapping: mean scores for gender

Once again, the glottaling scores are very interesting. Although the scores are still low, women clearly use more glottal stops than men. The fact that young women are driving the glottal stop use is significant and might be an indication of a prestige change in progress.

Gender	Mean	N	Standard deviation
Women	5%	8	0,04549333
Men	3%	4	0,005
Total	4%	12	0,03725425

Table 10.11: Glottaling: mean scores for gender

10.3 The Effect of Speech Style

Ever since Bell's earliest studies of tapping in NZE, speech style has been shown to have a big effect on the use of the tapped variant. The three different speech styles investigated in this study were therefore expected to yield widely different results. Unsurprisingly, the taps were most frequent in the interviews and least frequent in the word list. Glottal stops followed a similar pattern. On the contrary, aspirated stops were most frequent in the word list and less common in the interview. The table below shows the number of tokens for each variant:

Task/Variant	Aspirated stop	Tap	Glottal stop	Unclear	Total
Word list	240	64	1	3	308
Text	198	119	15	3	335
Interview	82	136	22	3	243

Table 10.12: Number of tokens for each variant according to speech style

In both reading tasks, the tapping percentage frequency is lower than that of the aspirated stop. The tapping score is strikingly low, especially in the word list in which it only reaches 21%. It must be noted that *all* occurrences of tapping in the word list happened in the numbers which had to be read out loud before reading the word. Speakers would therefore use a tap in the word 'thirty-six' and immediately follow it up with an aspirated stop in 'little'. No speaker used anything but an aspirated stop in the actual words chosen for the word list. This is a very clear sign that tapping in NZE is nowhere near the semi-categorical level of tapping in AmE. The table below shows the percentage frequency of each variant for all three tasks:

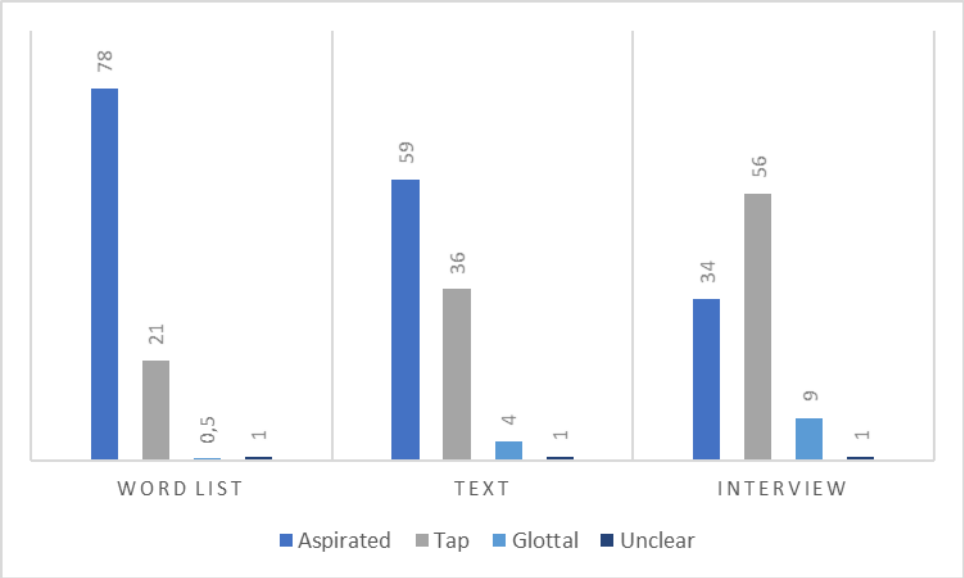


Figure 10.4: Variant repartition in percentage according to speech style

The fact that the tapping frequency is so low in both reading tasks points towards the fact that tapping is very much a subconscious change. If it were a consciously adopted prestige change, the results would likely show some tapping in the word list, especially given that 67% of the speakers are middle-class women. The effect of speech style on tapping frequency in this corpus clearly shows that the tap is not a prestige variant. On the contrary, /t/ seems to be realised as a tap when the speaker is least aware of their speech.

Holmes's assessment (1994, p. 209) that t-voicing seems to have entered NZE through the vernacular style of working class speakers is completely upheld by the PAC data. However, the spread seems to have been completely interrupted on the style spectrum. There is no sign of middle-class women driving the tap frequency increase and the PAC data shows no evidence of the tap becoming an acceptable variant in formal styles.

Looking at speech style also led to some interesting micro-analyses, especially when some of the words from the word list were consistently tapped in the interviews. For instance, the word *little*, which was not tapped once in the readings of the word list, was tapped nine out of ten times in the interviews. Similarly, the word *getting* (similar to *betting*, which was never tapped in the word list) was tapped all three times it appeared in the interviews. These micro-analyses support the assessment that tapping in NZE is very much a feature of informal and casual styles.

10.4 The Effect of Word Position

The coding used in this study was designed to analyse the effect of word position on the choice of /t/ variant. Holmes (1994, p. 212) found that tapping is much more likely to happen word-finally than word-medially, which is completely upheld by this study. The amount of tokens for each variant depending on word position is shown in the table below:

Word position/Variant	Aspirated stop	Tap	Glottal stop	Unclear	Total
Word-medial	422	165	1	5	593
Word-final	98	154	37	4	293

Table 10.13: Number of tokens for each variant according to word position

The graphs below further illustrate the striking difference in the tapping frequency word-medially and word-finally. Taps, in grey, are only used 28% of the time in word-medial environments; they are used more than half the time word-finally. On the contrary, aspirated stops go from a frequency of 71% word-medially to 33% word finally. This is mainly interesting because word-medial environments are more perceptually salient. Holmes (1994, p. 219) indeed notes that New Zealanders' consciousness of tapping in American accents tends to focus on word-medial environments and more specifically on words such as *letter* or *butter*. However, both Holmes's and the PAC data show that in NZE, tapping does not tend to happen in those types of environments.

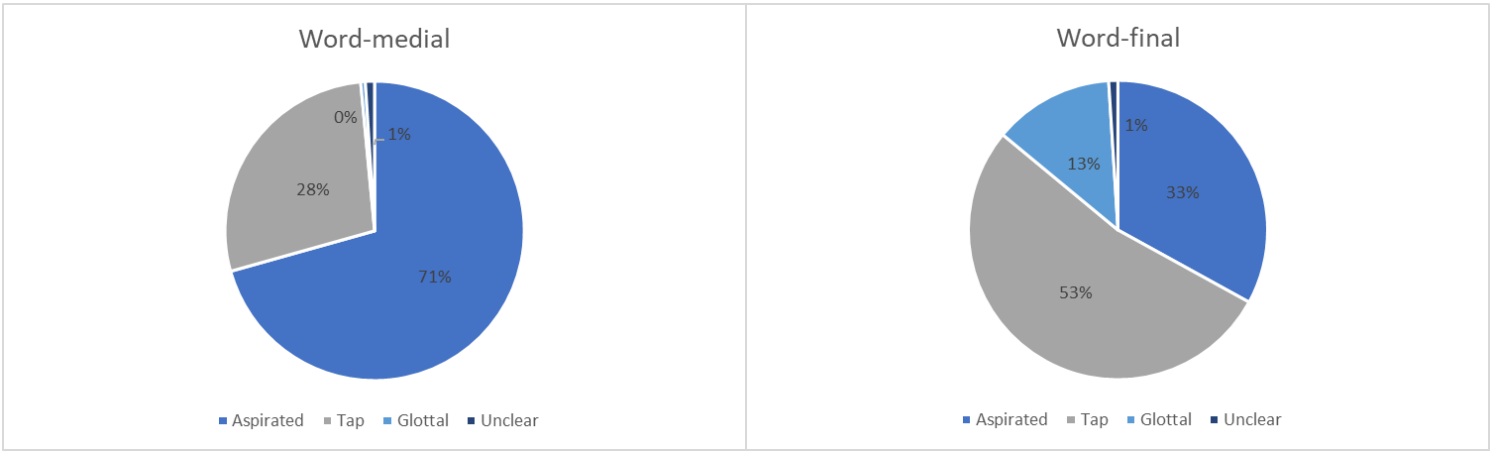


Figure 10.5: Variant repartition in percentage in word-medial and word-final position

The graph below shows the percentage frequency of both word positions for each variant. Tapping seems to occur more often word-medially, but that is only due to the fact that more word-medial contexts appeared in the study (593 for 293). Indeed, the inclusion of the word list

and the presence of twenty number tokens (all numbers from 30 to 49) which were frequently voiced skew the results. When comparing the repartition of the tap to the repartition of the aspirated stop, it is clear that the voiceless variant is favoured in word-medial environments and the tap in word-final environment.

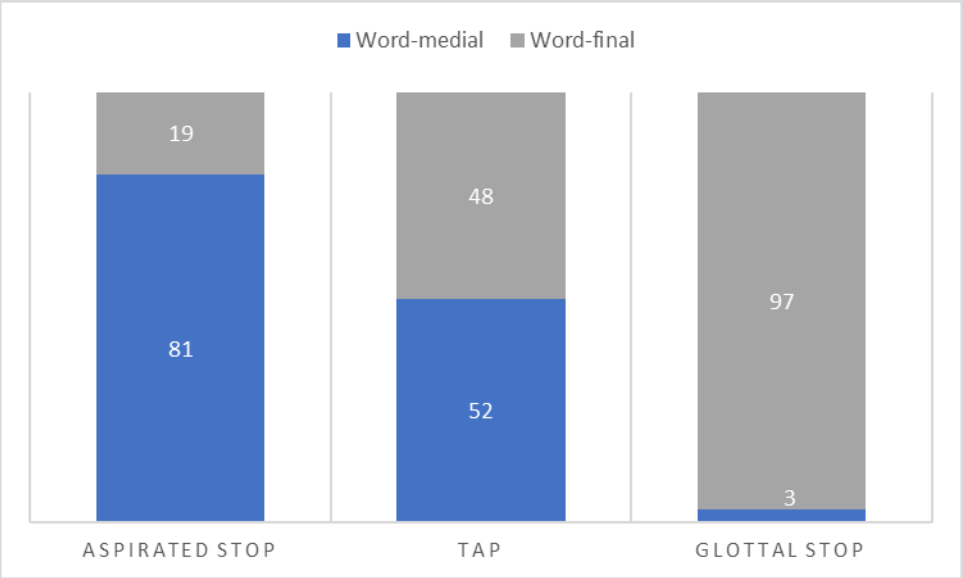


Figure 10.6: Word position repartition in percentage for each variant

As to the glottal stop, it unsurprisingly happens almost exclusively in word-final environments. This expected finding upholds the studies which have previously been led on the matter. Only one glottal token happened word-medially (see table 10.9 above), which clearly shows that the glottal replacement is limited to word-final environments.

11 Discussion

With her 1994 study, Janet Holmes provided the first clear evidence that tapping was a change in progress in NZE. Since then, a few studies have confirmed her findings, but there has not been any recent quantitative study on the matter to try and assess how her predictions hold up today. This section will therefore discuss the results of the analysis above in light of the previous work that has been done on tapping in NZE.

11.1 A Change in Progress

Tapping

So far, all studies analysing tapping in NZE (and, to my knowledge, in other varieties of English) have found that the younger speakers are, the more taps they produce. Younger speakers were therefore expected to produce more taps than middle-aged speakers who were expected to produce more taps than older speakers. Very surprisingly, this turned out not to be the case overall. 38% of the tokens produced by younger speaker were taps, and 52% of those produced by middle-aged speakers were taps. Older speakers expectedly produced taps 23% of the time. The fact that middle-aged speakers produced more taps than young speakers was unforeseen, especially given the fact that those speakers are all middle-class informants.

Nevertheless, the data from the formal interviews shows that the overall results do not seem to be indicative of a setback in the spread of the tapped variant. They rather suggest that linguistic tasks affect different groups of speakers in different ways, which might have an impact on the results of large-scale sociolinguistic studies which use reading tasks.

The contrasts in the levels of tapping between old, middle-aged and young groups of speakers in the formal interviews suggest that tapping in NZE appears to still be a change in progress. Young people's tapping frequency was 78%; middle-aged speakers produced taps 65% of the time and older speakers 39% of the time. Holmes's prediction that tapping might become semi-categorical in casual styles one generation after her study (Holmes, 1994, p. 222) is partially upheld: even though the styles investigated in this paper were far less casual than the ones she investigated in 1994, two young speakers out of three used no aspirated stops at all in the formal interview. The data from the PAC corpus therefore seems to indicate that the change has not stabilised yet, but although it is still undergoing, it seems like it is approaching completion. Young speakers are still tapping more than the previous generations, and although their scores are much lower in the more formal tasks, the variant does look like it is approaching semi-categorical status among young speakers in casual styles.

Confirming this trend would obviously require the study of a larger corpus of conversational styles with more young speakers, especially given the fairly scattered tapping frequencies of the young speakers of this corpus. It would also be interesting to compare the tapping frequencies of young and middle-aged working class people to see if their scores are much higher than those of middle-class speakers.

Glottaling

The results also completely support the many observations of an increase in the use of glottal stops in NZE. Young speakers' glottaling frequency was found to be higher than both middle-aged speakers' and older speakers' frequencies. Overall, the glottal variant was not frequent at all (4%), but it seems to be comfortably installed in the NZE repertoire: only one speaker did not produce any glottal stops. It also must be noted that young women had the highest glottaling frequencies. Even though those frequencies were not nearly as high as the ones for tapping or the use of the aspirated stop, the fact that young middle-class women's use of glottal stops is much higher than other groups' indicates that a change might be in progress.

Glottaling in NZE does not look like a typical vernacular change as it seems to be led by women. However, the use of glottal stops does favour word-final environments, which is more typical of changes from below than changes from above. It was also a lot more common in the interviews, just as the tapped variant. Holmes notes that the use of glottal stops might be a rhetorical device with an emphatic function. (1994, p. 214) After a closer examination of the glottal tokens from this corpus, I was unable to confirm or deny that hypothesis, mainly due to the very few glottal tokens found in the corpus. The glottal stop did seem to occur just as often between stressed syllables as between a stressed and an unstressed syllable, which differs from Holmes's findings.

11.2 Questioning the Source of the Change

Most of the evidence about tapping in NZE points towards it being a typical vernacular change, which has entered the dialect through the speech of working-class speakers and is now spreading in the middle-class. Knowing more about the way the variant entered NZE is also a way to find out more about its origins: a vernacular variant is more likely to be phonetically motivated, given that it is also more likely to be subconscious. This analysis has supported and confirmed the evidence found by previous studies; tapping is indeed a subconscious vernacular change, and is most likely phonetically motivated. I will detail the evidence in the sections below.

Gender

In this study, men used the tapped variant significantly more than women: the male tapping frequency was 53% and the female tapping frequency was 28%. This suggests that men are responsible for the spread of the variant, even in the middle-class which is the common socio-economic background of all the speakers in this study. Holmes's suggestion that young women are leading the change in the middle class (1997, p. 19) is therefore not supported by this data. On the contrary, it seems that middle-class men have taken on the variant quicker than middle-class women. This supports the hypothesis of a vernacular change, and weakens the hypothesis of a supposed concurrent prestige change driven by middle-class women (see 6.2).

Speech style

Speech style had a striking effect on the tapping frequencies. The overall tapping frequency was 56% in the interview, 36% in the text and 21% in the word list. It is very clear that tapping is a subconscious phonetic process which is avoided by the speakers when they are conscious of their speech, as well as in more formal situations. These results were expected and fall in line with those of previous studies. It was particularly interesting that no word from the word list was pronounced with a tap, even by the speakers with tapping frequencies as high as 93% in the interview. However, the numbers read aloud before the words were often tapped: this is further evidence that tapping only happens when the speaker is not aware of their pronunciation. Similarly, many words pronounced with an aspirated stop in the word list were said with a tap in the formal interviews. Again, this proves that the tap is a subconscious vernacular variant and that the prestige variant remains the aspirated stop.

Word position

When people first started to notice tapping in NZE, the layman explanation was that young New Zealanders were starting to adopt an American accent. That explanation made a lot of sense indeed, as American voices were being massively exported all over the world through songs and movies. If we take the hypothesis that tapping in NZE is the result of the spread of an American innovation, we have to deduce that this change would be lexically motivated and would first happen through words which are often heard in American contexts. Hay et al. (2008, p. 38) give the example of a letter deploring the transformation of *daughter* into *dodder*. If the

change did come from America, it would indeed be likely that such common words pronounced with a word-medial /t/ would be the first to be said with a tap. However, the data paints a completely different story.

Overall, tapping was much more frequent word-finally than word-medially. 53% of word-final /t/s were tapped, as opposed to only 28% of word-medial /t/s. Speakers were therefore much more likely to use taps in word-final environments. As mentioned above (see 10.4), that is related to the fact that word-medial environments are perceptually a lot more salient. (Holmes, 1994, p. 219) If the change was a prestige change, or change from above the level of conscious awareness, speakers would most probably tend to use taps in salient environments (words such as *butter*, *daughter*, etc). However, the fact that they favour word-final environments suggest the opposite conclusion. Since speakers use taps in the environments that they are least likely to notice as potential tapping situations, the spread of tapping is most likely a spread from below the level of conscious awareness.

All of the evidence therefore seems to point to a similar conclusion: tapping is indeed a subconscious vernacular change. It was most likely phonetically motivated, since speakers do not seem to be aware of their use of the variant and appear to actively avoid it, as suggested by the word list task. Rather than being headed towards the American model in which tapping is compulsory and is no longer stigmatised, tapping in NZE seems to be purely driven by phonetic reasons such as ease of articulation. If we think back on the description of tapping in British English made by Hannisdal (2007) (see 5.2.2), it seems more likely that NZE and British English are going in the same direction; it is also likely that a study of tapping in other varieties of English such as Australian English or South African English would lead to the same conclusion. Tapping would therefore become a feature of connected speech in most varieties of English, driven by purely natural phonetic processes. It remains to be seen whether these sound changes will one day rise above their current stage of feature of informal speech, and become acceptable in formal and speech-conscious contexts.

12 Summary

The first part of this third and final chapter has allowed me to present the corpus used in this study and justify its use. I introduced the PAC programme and its main goals and described the Wellington and Christchurch sub-corpora which were later analysed. I described the tasks and speakers in the corpus, and presented the tools and methods with which I extracted and analysed the data; I also detailed the objectives of the study. In the second part of the chapter, I presented the results of the study through various tables and graphs which were selected to make the main tendencies of the data as clear as possible. The aim of the study was to provide more recent data on tapping in NZE, verify the accuracy of predictions which were made about fifteen years before the PAC New Zealand corpora were recorded, and contribute to the study of this still little-known change and of its origins. Thanks to the analysis of the data, I was able to observe that most of the observations made by Holmes (1994) are still valid today. I confirmed the status of the tapped variant as a vernacular variant, which entered NZE from below the level of conscious awareness. Finally, I was able to establish a parallel between the development of the tapped variant in British English and in New Zealand English.

Conclusion

In the introduction of the present work, I listed many of the reasons that make New Zealand English such a fascinating linguistic object. From its late settlement to its geographical isolation, from its place in the British commonwealth to its attempt to find political and cultural independence, New Zealand is shaped by countless historical and cultural elements that have turned it into a wonderful playground for historians and linguists alike. After having spent two years investigating this captivating variety, I have never been more convinced of the potential of the research opportunities in New Zealand English.

The aim of this thesis was to contribute to the description of New Zealand English. Many descriptions of the variety have been made over the past few decades, but the study of New Zealand English is still a new field and many questions remain unexplored. The specific phenomenon explored in this study was for instance the object of many brief descriptions, but few thorough studies, especially in recent years. This paper was therefore intended to play a part in the development of the literature on New Zealand English, both by offering a summary of the studies previously led on the variety and by contributing with recent data and new analyses to add onto the existing studies.

In the first chapter of this thesis, I provided a description of the phonological system of New Zealand English and gave a detailed account of its context. Although the resulting account is neither lengthy nor exhaustive, it did allow me to prepare for the subsequent study of tapping in New Zealand English. I believe that studying a specific sound change in a language without being aware of the phonological, linguistic and historical context in which that sound is evolving does not make much sense, and that is why I thought this first part necessary to establish the framework for the rest of the study. I therefore engaged in establishing some basic knowledge about New Zealand, its history and the development of English in the country. I then described the phonological system of New Zealand English, focusing on the elements that distinguish it from RP. Lastly, I gave an account of variation in New Zealand, and more particularly on geographical and social variation as well as on the forces that have been driving changes in New Zealand English.

The second chapter focused on tapping, once again in the hopes of providing more context for the subsequent study. I first gave an overview of the phenomenon in general, in order to settle some theoretical issues such as the name used to refer to tapping in this study and the environment in which it can happen. Gaining a thorough understanding of the phonological phenomenon in question was crucial to the study, as it allowed me to devise the coding used in

my analysis and plan out the interpretation of the results. I then described the way tapping works in several varieties of English, which proved really useful as it provided benchmarks to which tapping in New Zealand English could be compared. Lastly, I focused on the studies on tapping in New Zealand English, and tried to give a detailed account of their observations and conclusions. This chapter allowed me to give all the context necessary to the understanding of tapping in New Zealand English, and to identify specific points which could benefit from more data and analysis.

In the third and final chapter of this thesis, I proceeded to describe the methodology involved in the analysis of the corpus as thoroughly as possible. I justified my choice of corpus and described its speakers as well as the tasks devised by the PAC protocol. I also listed the tools I used for the transcription, the coding and the extraction of the data so as to make the analysis as transparent as possible. Although the study would have been more complete had I been able to include speakers from various socio-economic backgrounds and to transcribe longer passages from the interviews in order to have more tokens, I still managed to reach some interesting conclusions and to provide data towards the attributes and the advancement of the sound change.

Tapping in New Zealand English has been an attested change in progress since the end of the 20th century. However, very few recent studies have looked at new data and tried to assess the advancement of the change. The analysis of the data from the Christchurch and the Wellington PAC sub-corpora showed that tapping is indeed a vernacular change, and that it has become comfortably installed in the speech of young and middle-aged middle-class speakers. It also showed that this change is limited to casual styles, and that occurrences of tapping in formal and speech-conscious situations remain extremely rare. Those observations allowed me to conclude that tapping in New Zealand English (as in many other varieties including British English) is most likely a phonetically motivated change. It is still unclear whether this change, which is happening near-simultaneously in many places, will remain a feature of casual speech or become an integral part of the formal register in New Zealand.

All things considered, this study of the phonology of New Zealand English and more particularly of the increasing use of taps has been fascinating as well as extremely edifying. Thanks to this thesis, I have gained a better understanding of the framework and tools needed to carry out a phonological study from start to finish. I have also been able to identify many potential areas which would benefit from more investigation. Further research should for instance be devoted to the advancement of the tapped variant in more formal speech styles

produced by working class speakers, and to the development of the glottal variant in New Zealand English.

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List of Illustrations

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Appendix

Figure 1.1: Map of New Zealand