

# Investigating Short Front Vowel Shifts in New Zealand English

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**Abstract.** This paper reports on an auditory analysis of the historical development of raised and fronted TRAP and DRESS vowels, and centralised KIT vowel in New Zealand English (NZE). For the sake of simplicity, three words from Wells's lexical sets (1982) are used to refer to these vowels. We aim to prove that the realisation of the short front vowels in NZE is not the result of a single factor, but two competing hypotheses have had important roles in this process: new dialect formation and a vowel chain shift. An empirical investigation is carried out regarding a one-hundred-year-long period which considers speech samples of ten male New Zealanders born between 1890 and 1990. The results show that raised TRAP and DRESS originated from England and this finding is supported by the theory of new-dialect formation; they remained high and continued raising as the first steps of a vowel chain shift, while in England they lowered later as an innovation. Thus, the realisation of these vowels is conservative in New Zealand English. Later, DRESS raising triggered KIT centralisation, which was a twentieth-century innovation. Based on the results, it is also proven that it is a push chain consisting of three sequential steps. Furthermore, it is demonstrated that DRESS is still raising, therefore, the vowel chain shift is still in progress.

**Keywords:** Vowel chain shift, New Zealand English, sound change, short front vowels, raising.

## 1. Introduction

Situated on a group of islands, New Zealand is an isolated country so its language could develop without much interaction. After the original Polynesian settlers, today known as Maori, the majority of immigrants came from various parts of the British Isles. Even though there were other nationalities present, they were in a minority. As a result, a relatively homogeneous English language evolved with regional and social accents which only slightly differ from one another. The only regional dialect can be found in Southland and part of Otago. This area was mainly populated by Scots so their pronunciation still resembles Scottish English.

As New Zealand English (hereafter NZE) is relatively young and recordings of its early speakers are available, changes can be detected and the development of NZE can be understood by comparing the recordings of early and more recent New Zealanders. Therefore, NZE has been widely researched and there is a great amount of data about it. Research has mainly focused on phonology and phonetics as these are its most salient features. Besides the fact that the speech rate of NZE is faster compared to other varieties (see Robb et al., 2004 and Warren, 1998), travellers usually comment on its unique pronunciation and intonation, rather than on other differences.

The most striking feature of NZE, the pronunciation of the TRAP, DRESS and KIT vowels is distinct compared to other standard varieties. In the study, we use

three keywords from Wells' lexical sets (1982) for these vowels. These lexical sets show how the different phonemes of English are pronounced. Wells uses one word in each set and these keywords represent the words that historically have the vowel contained in the keyword. As Hay et al. (2008, p. 32) point out, the change in the pronunciation of DRESS was particularly rapid causing misunderstandings even between the speakers of the same dialect. They also state that in the southern hemisphere, the KIT vowel is the most frequently noticed one because of the rivalry between Australia and New Zealand (p. 23). In NZE, DRESS and TRAP are both raised and fronted, while KIT is centralised. In our paper, after a brief overview of the historical background of the development of NZE (Section 2), we investigate how the unique pronunciation of the NZE short front vowels evolved by analysing recordings from New Zealanders born between 1890 and 1990 (Section 6), because this one-hundred-year-long period has not been researched before. We aim to prove that the realisation of these vowels is the result of the combination of two competing hypotheses, new-dialect formation and a vowel chain shift demonstrating that NZE is both conservative and innovative (Section 7). Based on empirical evidence, we also contend that it was a push chain starting with the raising of TRAP followed by DRESS, which resulted in the centralisation of KIT considerably later. The results also show that the centralisation of KIT is completed or close to completion, and the raising of DRESS is still in progress even after becoming a well-established pronunciation feature of NZE. Even though this linguistic phenomenon is well-documented, previous studies concentrated on one or two aspects of the pronunciation of the short front vowels (see Woods, 1997; Maclagan & Hay, 2004; McKenzie, 2005). In the present study, a comprehensive analysis is carried out investigating all its aspects.

## 2. New Zealand English

### 2.1. The settlement of New Zealand

According to Hay et al. (2008, pp. 3-4), by the time the first European settlers arrived in New Zealand, it was inhabited by the Maori who had come there more than one thousand years before. The first Europeans who reached New Zealand were Abel Tasman and his crew in 1642, but they made no landing. It was Captain Cook who claimed New Zealand for the British Crown in 1769, and the settlement of Australia began soon after, fostering the settlement of New Zealand. However, in the beginning, New Zealand was ungoverned until the Treaty of Waitangi was signed in 1840 and British sovereignty began. From then on, the European population of New Zealand grew rapidly and by 1858 the European settlers outnumbered the Maori.

Hay et al. also state that the European settlers arrived in New Zealand in three waves. In the first wave, the New Zealand Company arranged planned settlements in five colonies – Wellington, Nelson, New Plymouth, Otago and Canterbury. They aimed to have a vertical slice of the British society in the settlements, without the lowest and highest classes. Meanwhile, Auckland developed as an unplanned settlement. The idea of the carefully planned colonies came to an end when gold

was found in Otago in 1861, and thousands of immigrants arrived in the hope of finding gold. In this second wave, Irish immigrants came in huge numbers, along with Chinese miners as the first significant group of non-European immigrants (p. 5). Warren (2012, p. 88) claims that the third wave was initiated by the New Zealand government in the 1870s, when settlers arrived mainly from the south-west of England.

Hay et al. (2008, p. 6) note that the largest portion of immigrants came from the British Isles in the following distribution. The largest number, 51 per cent, came from England, the Scots made up 27.3 per cent, and the Irish 22 per cent. Even though the Australian-born immigrants constitute only 6.5 per cent, the majority of the early settlers came via Australia and spent some time there before travelling to New Zealand. Bauer and Warren (2004, p. 604) explain that since Australian English settlers predominantly came from the South of England, it indirectly reinforced the influence of the South of England features. Furthermore, the vast majority of settlers from the British Isles also came from the South of England in all the three waves resulting in the overwhelming influence of Southern English in spite of the fact that a wide range of varieties was present.

## 2.2. The development of New Zealand English

Bauer and Warren (2004, p. 603) draw attention to the fact that in a remarkably short time, a common language with a unique pronunciation developed, which was recognised by New Zealanders by the end of the nineteenth century. The New Zealand accent emerged more rapidly in cities with a mixed population, while in settlements with homogeneous population it required more time. Baxter et al. (2009, p. 292) acknowledge that the emerging variety was highly homogeneous and that it was facilitated by two factors. To begin with, the initial isolation of the first six settlements decreased dramatically from the 1870s by the increase of public railways and roads, giving high mobility for the first and second generation native-born New Zealanders. In addition, in the same period the number of children aged five to fourteen attending public schools more than doubled, resulting in their greater contact providing the opportunity for wider social networks.

Burridge and Kortmann (2004, p. 548) highlight the fact that the only exception of this homogeneity is the Southland “burr”, which is found in Otago and Southland, being the only regional variation in New Zealand. In this part of New Zealand, a semi-rhotic variety of English is spoken because this region was settled by the Scots, and this pronunciation feature can still be heard in their speech. Hay et al. (2008, p. 99) emphasise that distinctive vocabulary items and syntactic features are also found in this region, making it a dialect rather than an accent. Burridge and Kortmann (2004, p. 548) state that speakers often claim that accent and dialect differences exist. However, some of these differences existed from the beginning throughout New Zealand due to the different mixes in different regions, and it is only their prevalence that varies among regions. Schneider (2003 and 2007, cited in Warren 2012, p. 88) suggests that NZE is now at the differentiation stage and regional differences are about to emerge.

Warren (2012, p. 97) found that although New Zealanders consider their society to be classless, social varieties can be distinguished in present-day NZE

similarly to other countries even after earlier social barriers had been broken down. There are three existing social varieties in New Zealand, namely the cultivated, general and broad accents. These accents differ mainly in the pronunciation of the closing diphthongs (FACE, PRICE, GOAT, MOUTH) and the short front vowels (TRAP, DRESS, KIT). In the broad accent, the typical NZE pronunciation is the most extreme and consistent, with a lessening degree in the general and cultivated accents. Bye and de Lacy (2008, p. 25) claim that registers also differ in the amount of tapping. Hay et al. (2008, p. 102) point out that the closing diphthongs have social connotations as women speaking cultivated NZE carefully avoid the broad realisations of these vowels. Nevertheless, in the case of short front vowels, they pronounce the innovative forms.

### 2.3. New Zealand English short front vowels

Bauer and Warren (2004, p. 611) explain that during the twentieth century a new pronunciation of the short front vowels started to emerge, becoming a well-established feature of present-day NZE. Today, there are very few speakers who use the conservative pronunciation of the TRAP, DRESS and KIT vowels. The innovative realisation of these vowels is not stigmatised, and it is shown in the fact that New Zealanders with cultivated accent use the most advanced variants of TRAP, DRESS and KIT. The pronunciation of TRAP and DRESS is the same in Australian English and NZE, however, the KIT vowel is raised in Australian English but centralised in NZE. Thus, centralised KIT has a distinctive role as Australian English and NZE are quite similar to each other in other respects. According to the stereotype, Australians say *feesh and cheeps* and, in contrast, New Zealanders say *fush and chups*. This example illustrates that the KIT vowel has a centralised, schwa-like pronunciation in NZE, while in Australian English it is close to the pronunciation of the FLEECE vowel. Citing a similar anecdote, Gramley and Pätzold (2004, p. 305) wrote that in airport announcements a phrase like *Flight 846* is heard by Americans as *Flight ite four sucks*.

Hay et al. (2008, p. 42) claim that the high TRAP vowel was present in the speech of the first settlers who came to New Zealand, and it stopped raising after occupying the acoustic space of DRESS. DRESS started raising in the twentieth century and has not stopped yet. The KIT vowel centralised and lowered becoming a schwa-like vowel. In New Zealand, there is a tradition of making complaints whenever a language change occurs, but with the short front vowels it was different. This indicates that the change was below the level of consciousness until KIT started to centralise and DRESS raised further. At that time, letters of complaint written by conservative speakers of NZE started to appear in periodicals, like the following one quoted by Hay et al. (2008, p. 42): “George Best or George ‘Beast’? The latter was the way it was pronounced by a Kiwi radio newsreader on air recently. I wonder how the British public would react to their football icon being referred to in this way” (Vimala Menon, letter to *The Press*, 30 November 2005, p. A 18).

There are various hypotheses about the emergence of the unique pronunciation of the NZE short front vowels and the origin of this variety of English. Some experts claim that it was conservatism brought from the British Isles and preserved later (see Trudgill, 2004), while others say that it was

innovation. Still, other researchers came to the conclusion that both conservatism and innovation played a role in the development of their pronunciation (see Trudgill et al., 1998 & Hay et al., 2008). In other words, the present-day pronunciation of the NZE short front vowels is the result of the combination of new-dialect formation and a vowel chain shift. In the following sections, we provide an overview of these theories and hypotheses regarding the TRAP, DRESS and KIT vowels.

### 3. Theories about the origin of New Zealand English

#### 3.1. New Zealand English originated from Cockney

Hay et al. (2008, p. 84) wrote that when NZE was first recognised, the most common explanation for this “colonial twang” was that it was a transported version of Cockney, the dialect of the London working class. Samuel McBurney, a Scottish singing teacher was among the first ones who commented on the pronunciation heard in New Zealand. He travelled around Australia and New Zealand, wrote down interesting pronunciations and claimed that Australian English resembled Cockney. According to Gordon et al. (2004, p. 73), NZE and Australian English were considered to be the same, but the general opinion was that NZE was not as bad as Australian English. Hay et al. (2008, p. 85) also mention that Professor Arnold Wall, who was an expert on NZE, was surprised to hear a general tendency towards Cockney in New Zealand. Wall grew up in London and spoke Cockney himself as a child. Later he became the professor of English at Canterbury University College, today the University of Canterbury. According to his explanation, the NZE pronunciation resulted from the fact that the majority of the pioneers spoke Cockney. However, this explanation is refuted by settlement figures as demographic data show that only 15 per cent of the immigrants came from London. In addition, the social class of the early speakers suggests that the Cockney accent was probably stigmatised. Therefore, the term Cockney was generally used in a negative sense at that time.

This is supported by Gordon’s statement (2009, pp. 42-43) that in the 1900s, the accepted pronunciation was the pronunciation of the educated man of England. In consequence, as soon as the New Zealand accent was heard throughout New Zealand in children’s speech, letters of complaint started to appear. As Gordon and Abell (1990, pp. 24-25) point out, school inspectors said that bad company at home and in the street, as well as laziness, were the causes of the “impure vowels”. Soon, great efforts were made to eliminate it. From the beginning of the 1900s, school teachers were encouraged to engage in lip and tongue exercises, and books were written about the way English should be spoken. One of them is the work of the above-mentioned Arnold Wall, entitled *New Zealand English: How it Should be Spoken* (1939). In the *Whitcombe’s Graded Lessons in Speech Training* (Stewart, 1930), it is suggested that children should listen to phonographic recordings of King George V and Queen Mary as excellent models of speech for New Zealand children. The complaints reached the extremity to state that the New Zealand accent caused “minor throat and nasal disorders” (unknown commentator, 1910), and that New Zealand children were “crippled for



life by an inadequate command of their own language” (Brasch, 1956), both cited in Gordon (2009, p. 44).

### 3.2. A transported version of Australian English

Gordon et al. (2004, p. 71) noted that in the 1980s and 1990s, a number of scholars proposed that NZE derives from Australian English because of the pervasive similarities between the two varieties. Bauer’s arguments (1994, cited in Gordon et al. 2004, p. 74) are threefold for the hypothesis that NZE is a transported version of Australian English. First and foremost, there is a striking similarity in the phonetics and phonology of Australian English and NZE. Secondly, there has been a close connection between Australia and New Zealand from the beginning and, finally, a large amount of vocabulary is shared by the two countries. It was also stated by Gordon et al. (2004, pp. 226-229) that the Australian influence came to New Zealand through children. A large proportion of the British settlers spent some time in Australia before they came to settle in New Zealand (p. 86). These settlers brought their Australian-born children with them, and these children could have brought Australian English to New Zealand (p. 74). It is supported by the comments on the fact that the colonial accent was first noticed in children.

Hay et al. (2008, p. 86) wrote that the similarities between NZE and Australian English that exist today were frequently noted by commentators in the twentieth century, too. As for the close connection between the two countries, according to Hay et al. (2008, p. 12), it includes trade, security and foreign-policy ties as well as the possibility to travel, live and work in either of the two countries for New Zealanders and Australians due to the trans-Tasman travel arrangement. Taylor (2000, p. 322) explains that from the 1840s, fostered by the proximity of New Zealand to Australia, several Australians settled in New Zealand. In consequence, a significant amount of Australian vocabulary was borrowed into NZE. Gordon et al. (2004, p. 224) argue that in order to have a strong impact on the development of NZE, a focused variety of Australian English had to exist when the first European settlers arrived in New Zealand. The date of the emergence of a stable Australian English is estimated to be 1861, based on the fact that the number of native-born Australians was almost 50 per cent of the Australian population at that time. Therefore, Australian English could influence NZE.

However, as Hay et al. (2008, p. 86) indicate, this hypothesis of transported Australian English is ruled out by settlement figures as the rate of Australian settlers was insignificant with only 7 per cent, and the majority of the settlers came from the British Isles. Nevertheless, they state that a huge impact of Australian English on NZE is undeniable. Gordon et al. (2004, p. 230) have the same opinion and wrote that these factors provide evidence for a considerable impact of Australian English on NZE, but it is unlikely that NZE is purely the transported version of Australian English.

### 3.3. New-dialect formation

The theory of new-dialect formation is explained by Trudgill (2004, pp. 26-27), who states that based on the original dialect mix and demographic data, it is

possible to predict how a certain dialect will develop. Therefore, instead of being an arbitrary process, there is determinism in new-dialect formation. As southern hemisphere Englishes evolved from similar mixtures of dialects from the British Isles, new-dialect formation explains the similarities between them. The following metaphor is used by Trudgill: “If you bake cakes [...] from roughly the same ingredients in roughly the same proportions in roughly similar conditions for roughly the same length of time, you will get roughly similar cakes” (2004, p. 20). Normally, the process of new-dialect formation requires 50 years – two generations – to take place and children under the age of eight have a key role in it. Three chronological stages are distinguished in new-dialect formation and the development of NZE is described as follows.

According to Trudgill (2004, pp. 83-115), in the first stage immigrants from the British Isles, born in 1815 or later, arrived in New Zealand. They spoke their own variety of English with different speech patterns. However, during face-to-face interactions with other immigrants, accommodation began. In other words, they altered their speech to make communication easier, then it was followed by levelling, the elimination of irregular or minority features.

In the second stage, the offspring of the first settlers were born around 1840. Instead of a single dialect model to acquire, there was a wide range of competing features of various dialects from the British Isles. In consequence, these children freely combined these features which resulted in different combinations. The variants found in the newly emerging combinations reflected the proportions of variants in the dialects that were present in New Zealand at that time.

During the third stage, a distinctive NZE emerged in the speech of New Zealanders born between 1865 and 1890. As a result of continuous dialect levelling throughout the first and second stages, a stable form of a new dialect formed which retained regular forms found in the speech of the majority of first generation speakers and eliminated minority forms. In accordance with this, Gordon et al. (2004, p. 79) claim that the effects of this process, called focusing, can clearly be seen in NZE since it is a variety with exceptionally little regional variation. Nevertheless, Gordon and Trudgill (1999, p. 114) point out that present-day NZE is the result of both new-dialect formation and subsequent changes.

## 4. Language change

### 4.1. Change in pronunciation

As Wells (1982, p. 72) explains, differences between accents can be described by comparing the accents' synchronic state. In this synchronic approach, we examine the differences in phonetic detail, phonotactic distribution and the use of certain phonemes in particular words or morphemes in the existing accents. The simplest kind of dissimilarity between accents is the different realisation of a given phoneme which may arise due to different phonetic realisation rules. This kind of difference lacks linguistic function but has a key role in making a social or regional accent recognisable. According to Wells (1982, p. 93), accents are different because the pronunciation of English changes continuously and the changes vary in different regions and social groups. Innovations arise, causing earlier

pronunciation patterns to change, but they do not spread and become established everywhere. The motivation of innovations is the tendency that people always prefer articulatory gestures that require the minimum effort and still maintain intelligibility, known as the principle of the least effort.

Once a language change arises, Wells (1982, pp. 103-105) contends, there are two possible outcomes as it either remains as a feature of the accent or disappears. If it becomes established, it can be restricted to a particular area or spread further. An innovation can only spread if a group of people, who are considered to be the ones who set the fashion, pronounce the innovative forms. Then, the new pronunciation is imitated and may appear in all the accents of English.

Wells (1982, pp. 98-99) also highlights that if two phonemes are quite close to each other in phonetic space, a change in one of them may induce the other to change as well to avoid the risk of confusion between them. If the second phoneme occupies the auditory space of a third phoneme, it results in a kind of chain reaction, called push chain. There are also drag chains which start with a sound change leaving an unoccupied space behind. Then it is filled by another sound affecting multiple phonemes in the system. Sometimes, it is difficult to detect which phoneme was the first to change, especially if several phonemes are involved. Gordon (2013, pp. 253-254) notes that chain shift is an alternative to merger with the difference that in chain shifts the distinction between sounds is maintained but it is lost in mergers. Thus, chain shifts occur to avoid mergers, and preservation of contrast is considered to be an integral part of the process instead of the incidental consequence of chain shifts. The two basic criteria applying to chain shifting are the preservation of distinction between sounds and the interrelatedness of the sound changes.

#### 4.2. Vowel chain shifts

Both the definition and the general principles of chain shifting are presented by Labov (1994, pp. 118-119), who distinguishes two basic types of chain shifts, minimal and extended chain shifts. In a minimal chain shift, two phonemes are involved in such a way that one leaves its original position and occupies the phonetic place of the other phoneme. The phoneme whose phonetic space is occupied is referred to as the *leaving* element, and the one that occupies this place is called the *entering* element. The combination of minimal chain shifts results in an extended chain shift in which the leaving element of one minimal chain shift is replaced by the entering element of another minimal chain shift. Also, there is always a causal relation between the changing vowels in chain shifts, and the combination of the movements leads to a situation in which the phonemic inventory of the language is preserved. This reflects the capacity of the language to maintain distinctions.

As Labov (1994, pp. 116-117) explains, vowel chain shifts are governed by three general principles, as follows:

Principle I: In chain shifts, long vowels rise.

Principle II: In chain shifts, short vowels fall.

Principle IIA: In chain shifts, the nuclei of upgliding diphthongs fall.

Principle III: In chain shifts, back vowels move to the front.



Principle IIA is part of Principle II because the nucleus of an upgliding diphthong usually constitutes a single mora. Also, later it was modified referring specifically to the “short nuclei of upgliding diphthongs”. It is important to note that even though these principles are powerful in chain shifts, they do not apply in the independent movements of vowels. Moreover, there are also exceptions even in chain shifts with the remark that based on the historical record, Principle I is the only principle without exceptions. As for Principle II and Principle IIA, they apply to most of the chain shifts available, and only few exceptions can be found in the historical record. It is important to note that there are even fewer exceptions in the case of the latter one. Similarly to Principle I, Principle III applies generally, with only a few exceptions. Even though these principles are independent, Labov (1994, p. 121) claims that there are constraints as to how they combine with each other, making only a few repeated patterns possible.

One of the constraints that was altered later was that originally, the backward movement of vowels was not included in the principles. Therefore, KIT centralisation in NZE was considered to be an exception by Labov because a front vowel became a central vowel. However, after finding counterexamples while investigating chain shifts, Labov (1994, p. 200) reviewed Principle III as follows:

Principle III’: In chain shifts, tense vowels move to the front along peripheral paths, and lax vowels move to the back along non-peripheral paths.

Among other examples in chain shifts, this formulation accounts for the backward movement of KIT in NZE so based on Principle III’ it ceased to be an exception.

Labov (1994, p. 138) also discusses that the short front vowel shift, affecting the TRAP, DRESS and KIT vowels, in NZE serves as a good example for the violation of Principle II because two short vowels, TRAP and DRESS, are rising together. Labov (1994, p. 140) explains that these principles are not absolute or without exception and can only be seen as directions in chain shifting. Although social pressures can be powerful enough to reverse chain shifts, these principles do operate in most cases.

Based on the results of the present paper, it can be stated that the TRAP and DRESS vowels have raised, while the KIT vowel centralised, supporting the claim that TRAP and DRESS are indeed exceptions from Principle II, but KIT behaves according to Principle III’.

## 5. Hypotheses and previous studies

### 5.1. New-dialect formation and vowel chain shift: conservatism and innovation

The present paper attempts to prove that the evolution of the short front vowels in NZE cannot be accounted for with reference to a single hypothesis, but the combination of two competing hypotheses claiming that new-dialect formation (as introduced in Section 3.3) and the vowel chain shift (discussed in Section 4.2) which affected the NZE short front vowels played equally important roles in the process. We aim to prove this by providing empirical evidence that the raised form of TRAP and DRESS were present in the speech of third and fourth generation

New Zealanders when new-dialect formation was completed, partly because raised TRAP and DRESS were inherited from England and they also continued raising, constituting the first two steps of the vowel chain shift. In England, TRAP and DRESS lowered later but remained high vowels in NZE, so it can be seen as conservatism. On the other hand, KIT centralisation is an innovation since KIT began to centralise in the twentieth century as the third step of the vowel chain shift, well after the last stage of new-dialect formation, therefore it can be found only in the speech of fifth and sixth generation speakers. This is a widely researched topic, and studies supporting only the theory of new-dialect formation or the short front vowel shift, along with studies incorporating the two theories mentioned above, can be found in the literature.

The theory of new-dialect formation was put forward by Trudgill (2004, p. 43), who states that close TRAP and DRESS were the features of nineteenth-century English in the southeast of England, and British settlers brought these qualities from the British Isles to New Zealand. In support of this, he quotes the following to illustrate that TRAP was pronounced as [ɛ] in London English in the nineteenth century: “*cab* is *keb*, *bank* is *benk*, *strand* is *strend*” (Ellis, 1889, cited in Trudgill, 2004, p. 44). Besides, evidence also comes from the *Survey of English Dialects*,<sup>1</sup> in which data from elderly speakers, obtained in the 1960s and 1970s, show that the vowel in words such as *stack*, *hammer*, *apple*, *saddle*, *handle*, *rack*, *sack*, *mallet*, *paddock* is transcribed as [ɛ]. This is consistent with Gimson’s (1962) study, in which he notes that in the London accent /æ/ raised to cardinal [ɛ]. Thus, regional accents in the area surrounding London had close /æ/. As for the DRESS vowel, it is again Gimson (1962, both cited in Trudgill, 2004, p. 45) who provides evidence for the presence of both the close and the not close form, describing a variant halfway between [e] and [ɛ], and another one realised as [e]. At the end of the last stage of new-dialect formation, the close variants came out as winners resulting in the remarkably close realisations of TRAP and DRESS in NZE. In England, these vowels lowered later as an innovation, but this did not happen in NZE. Consequently, the close quality of TRAP and DRESS is considered to be conservative. Nevertheless, Trudgill acknowledges that TRAP and DRESS continued to change after the last stage of new-dialect formation.

In contrast, Bauer (1979, pp. 59-60) argues that TRAP and DRESS raised, followed by the centralisation of KIT as the result of a chain shift initiated by the fronting of STRUT to avoid the risk of overlapping in phonetic space. Later, Bauer (1992, pp. 255-257) revisited this theory and found that there is no causation between fronted STRUT and raised TRAP, and suggested that the raising of TRAP initiated the chain shift. Bauer (1992, p. 260) argues that the lowering of TRAP and DRESS in England happened too late to be evidence for conservatism in NZE, and supports this statement with findings that the short front vowels are still raising in NZE.

Trudgill et al. (1998, pp. 46-47) propose that both new-dialect formation and the short front vowel shift have a role in the development of NZE. The data on

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<sup>1</sup> *The Survey of English Dialects* (SED) is a detailed, nationwide survey of the vernacular speech of England carried out by researchers of the University of Leeds. Data were collected between 1950 and 1961 from predominantly male informants over the year of 65 to capture the most conservative forms of folk speech.

which their argument is based include tape-recordings from the *Survey of English Dialects* with close realisations of TRAP and DRESS, as well as the recordings of eight speakers from the *Mobile Disc Recording Unit*.<sup>2</sup> The impressionistic analysis of the eight speakers is provided and the results suggest that the close realisation of TRAP and DRESS, brought from the British Isles, was present in the speech of the first and second generations of New Zealanders, however, there was no centralised KIT found in the recordings. Furthermore, data collected from New Zealanders born in the 1900s show that there is an ongoing change of TRAP and DRESS, and the majority of the speakers have centralised KIT, proving that KIT centralisation is a twentieth-century innovation. Consequently, Trudgill et al. (1998, p. 49) state that conservatism and innovation are incorporated in the development of NZE.

In a subsequent study, Gordon and Trudgill (1999, pp. 114-115) analysed the short front vowels in the speech of 77 New Zealanders from the first generation, and it was found that 44% of the speakers had raised TRAP and DRESS, and one-third of them had both the raised and non-raised variants. While centralised KIT is not among the features of NZE in the given period, occasional examples can be found in the speech of first-generation New Zealanders. Seven speakers, without common ancestry or identity, have very few tokens of centralised KIT. They are from different locations in New Zealand, and their parents were born in various places in and outside New Zealand. Gordon and Trudgill (1999, p. 122) suggest that these tokens are embryonic variants, seeds from which the later change of the KIT vowel evolved. On the whole, these findings are consistent with those found in Trudgill et al.'s research (1998, p. 49) and suggest that raised TRAP and DRESS were imported from Britain and KIT centralisation happened subsequently.

This also accords with the observations of Hay et al. (2008, pp. 41-42), who state that in the *Origins of New Zealand English Project*<sup>3</sup> it was found that the first European settlers brought relatively high TRAP vowels, but centralised KIT was not present in their speech. TRAP continued to raise until the beginning of the twenty-first century and settled at the position of [ɛ], encroaching on the acoustic space of DRESS. In turn, DRESS started to raise occupying the acoustic space of KIT, which eventually resulted in its centralisation in the twentieth century. They claim that KIT centralisation is not an independent movement, but the third stage of the vowel chain shift in which the short front vowels are involved.

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<sup>2</sup> *The Mobile Disc Recording Unit* collected recordings of local music and conducted interviews with old people between 1946 and 1948. About 300 elderly people were recorded both in the North and South Islands.

<sup>3</sup> The aim of the *Origins of New Zealand English Project* (ONZE) is to document features, patterns and changes in NZE, and apply the findings to theories of language and language change. ONZE is based at the University of Canterbury and the Principal Investigator is Jan Hay. ONZE has three collections: the *Mobile Unit*, the *Intermediate Archive* and the *Canterbury Corpus*.

## 5.2. The push chain hypothesis

After proving that the short front vowels in NZE are affected by a vowel chain shift, we hypothesise that it is a push chain still in progress, consisting of three sequential steps. We state that raised TRAP, the first vowel to change in the vowel chain shift, led to the raising of DRESS by causing overcrowding in phonetic space and misperception in speech. Later, raised DRESS resulted in the centralisation of KIT, the third and last step of the vowel chain shift. Thus, the vowel chain shift is a push chain. The causal role of raised TRAP in the raising of DRESS is demonstrated by auditory evidence that the two vowels occupied the same phonetic space before DRESS started to raise. Regarding the question of whether the affected vowels changed simultaneously or sequentially, we claim that these were sequential steps and we aim to prove this by providing data that show the presence of raised TRAP with both the non-raised and raised variants of DRESS in the third generation of New Zealanders. Furthermore, the same pattern can be found in the case of DRESS and KIT as DRESS was fully raised but the realisation of KIT was not centralised in the third generation and it was either centralised or non-centralised in the fourth generation. In order to demonstrate that the vowel chain shift is still in progress, we use recordings in which DRESS is realised as cardinal [e] or [i] in the speech of speakers from the third and fourth generations, while in the fifth and sixth generations it is often [i:]. Thus far, several studies have found evidence that supports these hypotheses.

Langstrof (2006, p. 162) investigates the relationship between the NZE short front vowels and argues for the push-chain scenario in his study. He analysed the speech of 30 speakers born between the 1890s and the 1930s, the intermediate period of NZE. The speakers are divided into three groups, *early* (born between 1895 and 1905), *medium* (born between 1910 and 1920) and *late* (born after 1925) speakers. Based on phonetic analysis, he states that younger speakers have higher realisations of TRAP and DRESS along with a more central realisation of KIT in the whole sample. Furthermore, in the group of *early* speakers KIT and DRESS are quite close to each other, which indicates that there was a transitory state when DRESS was raised but KIT was not centralised yet. It is supported by the fact that *early* males have both fronted and centralised allophones of KIT. These findings confirm both the push-chain hypothesis and the sequentiality of the chain shift. Langstrof (2006, p. 155) also claims that the vowel chain shift was completed in the intermediate period.

Watson et al. (2004, p. 205) also argue for a push chain in a diachronic study and their results support earlier findings. Three male speakers, born between 1901 and 1916, were analysed over a thirty-year-long period and speech samples were obtained from them three times, in the mid-1950s, in the late 1960s or early 1970s, and the mid/late 1980s. Prosodically accented words were chosen for analysis from continuous speech, and about 3,600 tokens were analysed. Compared to modern NZE, as data of the samples from the 1950s show, the KIT vowel was higher than the DRESS vowel, and TRAP and DRESS were not raised. Additionally, the vowel spaces in the three given periods differ significantly in the speech of each speaker. The later the recording, the closer the pronunciation is to modern NZE. Even though the extent of the change is different for each speaker,

it can be said that TRAP and DRESS raised without the centralisation of KIT, which suggests that these vowel shifts are part of a push chain.

Both studies mentioned above are consistent with the findings in Woods' work (1997, p. 107). In her study, she analysed the speech of five men and five women auditorily. The informants were divided into two groups, the speakers of the first generation were born in 1948 and the speakers of the second generation are the children and grandchildren of the first generation. Speakers belonging to both groups were recorded at the age of 70-80. Thirty tokens of TRAP and DRESS were examined in the speech of each speaker, and it was found that both TRAP and DRESS have a closer articulation in the second generation than in the first. While the difference is slight in the case of TRAP, it is considerable regarding DRESS. These results clearly indicate the pattern of raising and show that the shift in the short front vowels is motivated by a push chain which started with TRAP.

The above results are similar to those reported by Gordon et al. (2004, pp. 265-266), who found that speakers from the *Origins of New Zealand English Project* with raised DRESS also had raised TRAP, but raised TRAP occurred without raised DRESS. Similarly, raised DRESS occurred without centralised KIT, and there were very few speakers with centralised KIT without raised DRESS. As they explain, based on these findings, the causal relation is clear between these vowels, and the correlations point to a push chain. As KIT centralisation postdates both the raising of TRAP and DRESS, the possibility of a drag chain is excluded. Besides, the fact that DRESS raising happened later and was less complete than TRAP raising also supports this claim.

Hay et al. (2008, p. 42) focus on the DRESS vowel and point out that after KIT centralisation took place DRESS continued to raise and started to encroach on the phonetic space of FLEECE. Theoretically, it should not cause a problem because the two vowels belong to different classes, DRESS being a short vowel and FLEECE being a long vowel. Nevertheless, difficulties in perception arose due to the fact that voiced consonants lengthen preceding vowels and voiceless consonants shorten them in NZE, in the same way as in other varieties of English. Consequently, FLEECE followed by a voiceless consonant is shorter than DRESS followed by a voiced consonant for many young speakers in New Zealand, which results in misunderstanding and leads to the increasing diphthongisation of FLEECE. As it is concluded by Hay et al. (2008, p. 42), the NZE short front vowels have not settled into stable patterns yet.

Following the previous study, Maclagan and Hay (2004, p. 3) also found that DRESS is still raising in NZE. In their work, they analysed the speech of 80 speakers from the *Canterbury Corpus*,<sup>4</sup> and the results show that speakers continue to raise DRESS in general, and for some speakers, the acoustic space of DRESS and FLEECE completely overlap. Furthermore, some speakers break DRESS into a diphthong instead of raising it further. The diphthongisation of DRESS is restricted to older speakers, while younger informants tend to raise it.

McKenzie (2005, p. 14) analysed both the word list and casual speech recordings of eight young, non-professional speakers from the *Canterbury Corpus*, and compared her results with those of the previous study. It was found

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<sup>4</sup> The *Canterbury Corpus* is one of the collections of the *Origins of New Zealand English Project*. For more information see the previous footnote.



that the difference between the length of DRESS and FLEECE decreased slightly for young, non-professional speakers. Although this difference is not significant, it indicates some progression from the speakers that were analysed by Maclagan and Hay (2004, p. 3) earlier. McKenzie (2005, p. 23) also found that there is a great overlap between DRESS and FLEECE in terms of acoustic space, and FLEECE is very often diphthongised for all the speakers, even more for females. An interesting finding is that in the wordlist data, higher DRESS and diphthongised FLEECE are exaggerated, contrary to the expectations as speakers tend to use conservative variants when reading wordlists. The fact that the innovative forms were produced in careful speech suggests that these variants are not marked or used consciously. Otherwise, they would have been avoided. McKenzie (2005, p. 24) suggests that FLEECE is influenced by DRESS raising and a few questions emerge in connection with this, but it is outside the scope of the present paper. Therefore, it is not discussed henceforth in any detail.

## 6. Methods

### 6.1. Data collection

The present paper reports on the analysis of ten male speakers born between 1890 and 1990. The speakers were chosen on the basis of the following criteria: (1) the informants were either born in New Zealand or moved there before the age of seven, the end of the critical period in language acquisition, to ensure that their speech sample is an authentic source of NZE; (2) the informants were born between 1890 and 1990 so they belong to one of the four subsequent generations following the last stage of new-dialect formation; (3) only male speakers were chosen since there were no available recordings of female speakers from the early years, and considering the leading role of women in language change and the probability that they use more advanced forms, we decided to choose speech samples of male speakers for analysis in the whole study to avoid misleading results; (4) the informants were interactants in interviews, so the vowels could be analysed in running formal speech recorded in the same situation for all the speakers; (5) the informants' background data were available.

The speakers were divided into two groups according to their birth date:

- Group 1 consists of New Zealanders born between 1890 and 1940. This period covers two generations after the third stage of new-dialect formation, the third and fourth generations.
- In Group 2, there are New Zealanders born between 1941 and 1990, and they belong to the fifth and sixth generations.

Five available male speakers met the requirements in Group 1, so an equal number of male informants were chosen for Group 2 as well. Speech samples for third and fourth generation New Zealanders were selected from the audio collection of the Tauranga Memories website,<sup>5</sup> maintained by the Tauranga City Libraries in New Zealand. This digital library was created with the intention of sharing community knowledge with future generations by creating an archive

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<sup>5</sup> Available at <http://tauranga.kete.net.nz/en/site>.

which contains digital images, videos, documents and, most importantly, sound files. Even though childhood memories and photographic technology are among the topics of the conversations, most of these interviews are about reminiscences of the war, and almost exclusively men were interviewed. The conversations were recorded between 2006 and 2014.

Speech samples for fifth and sixth generation New Zealanders were obtained from the public website of *digitalNZ*,<sup>6</sup> which contains collections from libraries, museums, galleries, government departments, community groups and the media. This website was created in 2008, to make reliable New Zealand material accessible to the public. Sound files of male speakers were chosen from Radio New Zealand and 95bFM programmes. The conversations cover a wide range of topics, mainly current issues of New Zealand including the state of Wellington's water and tax changes, among others. All of the conversations were recorded in 2020.

The length of the conversations differs, the shortest being 5 minutes 59 seconds long, and the longest lasts for 90 minutes and 56 seconds. The number of participants in the interviews also varies between two and four. In some recordings, there is background noise due to the recording equipment used or the nature of the location, but the quality is still adequate for analysis. Recordings with too much background noise or poor sound quality were excluded from the analysis.

## 6.2. Data analysis

The analysis focuses on the realisation of the TRAP, DRESS and KIT vowels in formal speech, whether the speakers pronounce the raised or the non-raised form of TRAP and DRESS, and if the realisation of KIT is centralised or non-centralised. Furthermore, the date of the appearance of the raised and centralised forms respectively, is also detected. The relationship between the three vowels is also investigated, as well as the pattern within the two groups.

In order to be able to give a reliable analysis of the vowels by listening to each of them separately and repeatedly, utterances containing the TRAP, DRESS and KIT vowels were chosen and cut from the recordings. The number of the utterances varies among the speakers as one utterance often contains more tokens, and at other times tokens could be found in separate utterances. The orthographic transcription of the utterances was made. They were named and numbered as follows: in S1U1, S1 means 'Speaker 1' and U1 means 'Utterance 1', in S1U2, S1 means 'Speaker 1' and U2 means 'Utterance 2', etc. The cuttings were made by using version 2.4.1 of *Audacity*,<sup>7</sup> a free recording and editing software, and saved in WAV format. The words containing the vowels are listed in Table 1; the analysed stressed vowel is marked in bold in the words.

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<sup>6</sup> Available at <https://digitalnz.org/records?tab=Audio&text=#/>.

<sup>7</sup> Available at <https://audacityteam.org/>.

	<b>TRAP</b>	<b>DRESS</b>	<b>KIT</b>
Speaker 1	Anzac, <b>chaps</b> , <b>that</b> , <b>than</b> , <b>back</b> , <b>dad</b>	remember, <b>seven</b> , <b>seventy</b> , <b>medicine</b> , <b>benzin</b> , <b>never</b> , <b>reminiscence</b> , <b>engineering</b>	<b>sixty</b> , <b>sister</b> , <b>slippers</b> , <b>strict</b> , <b>ticket</b> (boy), <b>did</b>
Speaker 2	<b>that</b> , <b>travelled</b> , <b>camera</b> , <b>back</b> , <b>ramshackle</b>	November, <b>seventeen</b> , <b>century</b> , <b>collection</b> , <b>left</b> , <b>negatives</b>	<b>big</b> , <b>sixteen</b> , <b>fishing</b> , <b>tint</b>
Speaker 3	<b>landed</b> , <b>that</b> , <b>advertising</b> , <b>standing</b>	remember, <b>ten</b> , <b>nineteen-twenty-</b> <b>seven</b> , <b>getting</b>	<b>thin</b> , <b>airstrip</b> , <b>lived</b> , <b>thing</b> , <b>big</b>
Speaker 4	<b>had</b> , <b>Captain</b> (Cook), <b>hand</b> , <b>aspects</b> , <b>drawback</b> , <b>actual</b>	<b>there</b> , <b>regret</b> , <b>mentors</b> , <b>clever</b>	<b>something</b> , <b>nineteen thirty-six</b> , <b>thing</b> , <b>prickly</b> , <b>big</b> , <b>nineteen-forty-six</b> , <b>fifty-seven</b> , <b>biscuits</b>
Speaker 5	exams, <b>back</b> , <b>math</b> , <b>plantation</b> , <b>understand</b>	<b>Second</b> (World War), <b>left</b> , <b>never</b> , <b>set up</b>	<b>nineteen fifty-one</b> , <b>physics</b> , <b>things</b> , <b>little</b> , <b>everything</b>
Speaker 6	<b>actually</b> , <b>bad</b> , <b>than</b> , <b>contract</b> , <b>back</b>	<b>never</b> , <b>request</b> , <b>cross- connections</b> , <b>twenty-four/seven</b> , <b>question</b>	<b>thing</b> , <b>shifts</b> , <b>condition</b> , <b>criticism</b> , <b>fifty</b> , <b>things</b> , <b>think</b> , <b>shifts</b>
Speaker 7	<b>actually</b> , <b>tax</b> , <b>happening</b> , <b>that</b> , <b>back</b>	<b>secondary</b> , <b>ending</b> (up), <b>necessity</b> , <b>get</b> , <b>less</b>	<b>fifty</b> , <b>think</b> , <b>this</b> , <b>systems</b> , <b>business</b> , <b>benefits</b>
Speaker 8	<b>active</b> , <b>Panel</b> , <b>managing</b> , <b>that</b>	<b>yesterday</b> , per <b>cent</b> , <b>forty-seven</b> , <b>trend</b> , <b>let's</b>	<b>fifty-nine</b> , <b>fifty-</b> <b>five</b> , <b>Jim</b> , <b>ninety-</b> <b>six</b> , <b>kids</b> , <b>this</b>
Speaker 9	<b>thanks</b> , <b>exactly</b> , <b>plastic</b> , <b>that</b>	<b>get</b> , <b>expressed</b> , <b>says</b> , <b>better</b>	<b>this</b> , <b>thing</b> , <b>opinions</b> , <b>drink</b> , <b>myth</b>
Speaker 10	<b>actual</b> , <b>bad</b> , <b>back</b> , <b>actually</b> , <b>crack</b>	remember, <b>Second</b> (Chance Charlie), <b>ten</b> , <b>everyone</b> , <b>yes</b>	<b>think</b> , <b>finished</b> , <b>biggest</b> , <b>did</b> , <b>things</b>

Table 1. List of words of each speaker with the analysed vowels in bold.

Only accented vowels were analysed because in NZE there is no distinction between [ɪ] and [ə] in unstressed syllables, and it could have been confusing in the analysis of the KIT vowel. Even though function words are usually unstressed, *than* occurred in a stressed position in the recording of Speaker 6, therefore, it could be used for analysis. Other function words chosen for analysis are also stressed.

The phonetic context was variable but vowels before [l] were excluded because as Wells (1982, p. 609) points out, in NZE, [l] tends to be dark in all phonetic

environments, and it has a considerable effect on the preceding vowel. Following this statement, Bauer (1986, pp. 242-244) explains that l-vocalisation is more common after front vowels than back vowels and vowels are retracted when they precede [l]. Therefore, the allophones of vowels before [l] differ from allophones in other environments. In particular, TRAP and DRESS are variably neutralised before [l], mostly in favour of the TRAP vowel, this feature being one of the most common types of neutralisation in NZE. As for the KIT vowel, it often merges with [l] when preceding it, resulting in a new back vowel [u]. This is an unrounded and strongly centralised vowel, having the length of a long vowel.

At least four tokens were analysed for each vowel for all speakers both in Group 1 and in Group 2. In the case of shorter recordings, the whole recording was used for analysis while it was not necessary when working on longer recordings. Thus, only part of the longer recordings was analysed to have enough tokens for each vowel. As it was an auditory analysis and the pronunciation of the vowels was determined by listening to the words, each token was analysed twice to ensure that the analysis is reliable, and only consistent results were included in the study. In the second analysis, which was carried out two months later, the same method was used as in the first one.

### 6.3. Scope and limitations of the study

It should be pointed out that in the analysis, phonemic environments are not examined in detail, and the speakers' social background is not known so comparisons based on such data were not made. Furthermore, it was not possible to investigate the difference in the realisation of TRAP, DRESS and KIT between male and female speakers as only samples of male speakers were analysed. Hence, further data collection is required to compare the pronunciation of these vowels in the speech of male and female New Zealanders. Also, an auditory analysis may be susceptible to bias, but the repetition of the analysis was employed to avoid this problem. The small size of the dataset meant that it was not possible to carry out a quantitative analysis, but it does not constitute a problem because the study aimed to shed light on the evolution of the short front vowels by identifying the quality of these vowels in different generations and defining the time period when the changes in pronunciation took place. The novelty of the study lies in the fact that it provides comprehensive understanding about the evolution of the short front vowels in a time period covering one hundred years, which has not been done before.

## 7. Results

In this section, the results of the analysis of the TRAP, DRESS and KIT vowels are presented regarding the use of these vowels in the speech of individual speakers, as well as within the two groups, and differences between the patterns of use in different generations are also identified. Table 2 provides the summary of the results obtained from the auditory analysis of TRAP, DRESS and KIT for the whole dataset. More advanced pronunciation features, compared to the generally observed patterns, can be found in blue while features that lag behind are in orange. The realisation of each vowel is also indicated by the phonetic symbols of

the cardinal vowels. The top half of the table shows the characteristics of Group 1, and the bottom half of the table the characteristics of Group 2. The detailed description of the results is given in the next two sections.

	Name	Speaker no.	Mother country	Date of birth	Moved to NZ	Date of recording	TRAP	DRESS	KIT
3rd and 4th generation	Bob Harkness	S1	NZ	1913	born in NZ	2012	R [ɛ]	R/NR [ɪ] [ɛ]	NC [ɪ]
	Alf Rendell	S2	NZ	1917	born in NZ	2012	R [ɛ]	R [e] [ɪ]	NC [ɪ]
	John Gard'ner	S3	NZ	1918	born in NZ	2006	NR [æ]	NR [ɛ]	NC [ɪ]
	Don Murray	S4	NZ	1936	born in NZ	2012	R [ɛ]	R [e] [ɪ]	NC/C [ɪ][ə]
	Kenneth Miller	S5	NZ	1940	born in NZ	2014	R [ɛ]	R [e] [ɪ]	NC [ɪ]
5th and 6th generation	Andy Foster	S6	England	1961	1966	2020	R [ɛ]	R [e] [ɪ]	C/NC [ə][ɪ]
	Stuart Nash	S7	NZ	1967	born in NZ	2020	R [ɛ]	R [e] [ɪ] [i:]	C [ə]
	Wallace Chapman	S8	NZ	1969	born in NZ	2020	R [ɛ]	R [ɪ] [i:]	C [ə]
	Jesse Mulligan	S9	NZ	1978	born in NZ	2020	R [ɛ]	R [ɪ] [i:]	C [ə]
	Guy Williams	S10	NZ	1987	born in NZ	2020	R [ɛ]	R [e] [ɪ] [i:]	C [ə]

Table 2. Summary of results of the auditory analysis of TRAP, DRESS and KIT.<sup>8</sup>

### 7.1. The analysis of the recordings in Group 1

The first set of the analysis examined the realisation of the TRAP, DRESS and KIT vowels in the speech of informants representing third and fourth generation New Zealanders, referred to as Group 1. Based on the auditory analysis of these vowels, it has been found that the majority of these speakers has raised TRAP and DRESS, but not centralised KIT. As for TRAP and DRESS, TRAP is invariably pronounced as [ɛ] while DRESS ranges between [e] and [ɪ] when raised. A notable and the only exception is Speaker 3 as in his speech, neither TRAP nor DRESS is raised. Furthermore, even though Speaker 1 has both raised TRAP and DRESS, the non-raised form of DRESS is also present in his speech. Interestingly, the raised and non-raised form of DRESS appears in the same words in two cases. Turning now to the experimental evidence on the realisation of the KIT vowel, it has been found that the majority of the speakers do not have centralised KIT. The only speaker

<sup>8</sup> R stands for 'raised'; NR for 'not raised'; C for 'centralised'; NC for 'not centralised'.



with centralised KIT is Speaker 4, who produces both the centralised and non-centralised forms, so in his speech KIT is either realised as [ɪ] or [ə].

Taken together, these results suggest that in Group 1 TRAP raising is fairly stable together with DRESS raising, but the extent of DRESS raising is varied. KIT centralisation has been found only in the speech of one speaker out of five, and even in that case, the non-centralised form is also present. Thus, based on the result of Group 1, the overall pattern is that the majority of speakers of the third and fourth generations have raised TRAP and DRESS, but not centralised KIT.

## 7.2. The analysis of the recordings in Group 2

The next section of the analysis was concerned with the realisation of the TRAP, DRESS and KIT vowels in the speech of informants representing fifth and sixth generation New Zealanders, referred to as Group 2. Compared to Group 1, it can be stated that the realisation of TRAP has not changed in Group 2. On the other hand, DRESS is invariably raised unlike in Group 1, but the extent of raising still varies between [e] and [ɪ]. Moreover, a third variant [i:] appears in the speech of as many as four speakers. The former variants are more common, though. Thus, it can be stated that there is considerable variability in the pronunciation of DRESS in Group 2, even greater than in Group 1 because of the emerging [i:]. While centralised KIT was extremely rare in Group 1, all the speakers have centralised KIT in Group 2, which shows that KIT centralisation is a well-established feature in the fifth and sixth generations. There is only one informant, Speaker 6, who produces either the centralised or non-centralised forms of KIT. The general pattern in Group 2, therefore, is that both raised TRAP and DRESS and centralised KIT are present in the speech of all the speakers. Together, these results provide important insights into how the pronunciation of NZE evolved. The next section, therefore, moves on to discuss and explain the findings.

## 8. Summary and discussion

### 8.1. Evidence for the vowel chain shift

It can be seen from the data in Table 2 that in Group 1, Speaker 3 is the only one who does not have either raised TRAP or DRESS and it suggests that these pronunciation features were present in NZE in the first 50 years after the end of the third stage of new-dialect formation, but they were not present in the speech of all New Zealanders. Nevertheless, TRAP raising is fairly stable in the speech of the majority of the speakers, which indicates that raised TRAP was a well-established feature in the third and fourth generations, probably because it was inherited from England, therefore, it was present in NZE from the beginning and came out as winner in new-dialect formation. A slight difference is observable in DRESS raising as even though four speakers out of five have raised DRESS, Speaker 1 produces both the raised and unraised forms of DRESS. The invariable presence of raised TRAP and both the raised and non-raised forms of DRESS in the speech of Speaker 1 indicates that TRAP was the first vowel to change followed by DRESS. Apparently, the two forms of DRESS co-existed in the initial state of the change, and they were allophones in free variation. As the change progressed,

the unraised form disappeared or remained in a few positions for some speakers. It is supported by data from fifth and sixth generation speakers since only the raised variants of DRESS are used. The centralised pronunciation of KIT is not observed in the speech of third and fourth generation speakers, but the non-centralised form is employed, except in the case of Speaker 4, who pronounces both the centralised and non-centralised forms. The sporadic appearance of centralised KIT in the speech of Speaker 4 shows that the KIT vowel started to centralise at the end of that period, considerably later than DRESS raised, and it was not widespread yet. The lack of centralised KIT together with the presence of raised TRAP/DRESS in the third and fourth generations, especially in the third generation, proves that it was a chain shift. The fact that centralised KIT appeared only later indicates that the raising of DRESS triggered the centralisation of KIT, and it was a twentieth-century innovation in NZE.

## 8.2. Evidence for the push chain

Another important point needs to be made about the data presented above regarding the push-chain hypothesis. The use of both the raised/unraised forms of DRESS and the centralised/non-centralised forms of KIT respectively, favour the push-chain scenario because the presence of both variants indicates a transitory state when TRAP and DRESS in the third and fourth generations and DRESS and KIT in the fifth and sixth generations occupied the same phonetic space. Thus, DRESS raised and KIT centralised to avoid misperception in speech. These results also favour the hypothesis that these were sequential steps in the vowel chain shift, as the transitory states provide evidence that the three steps occurred sequentially and not simultaneously. The use of centralised KIT is found generally among fifth and sixth generation informants, but in the speech of Speaker 6, both the centralised and non-centralised forms occur. In fact, the pattern of KIT centralisation in Group 1 is the mirror image of that in Group 2, and it indicates that KIT centralisation appeared in the speech of fourth generation speakers but became widespread only in the fifth and sixth generations. As the first instance of KIT centralisation occurred in the fourth generation, it cannot be the result of new-dialect formation but rather the third step of the short front vowel shift. Similarly to the DRESS vowel in Group 1, the KIT vowel also has two allophones in free variation in Group 2 for Speaker 6, while the majority of the speakers realise KIT as [ɛ]. The fact that in the fifth and sixth generations, there is only one exception, Speaker 6, regarding KIT centralisation suggests that in the fifth and sixth generations, the centralisation of KIT was completed or close to completion. The most notable feature of fifth and sixth generation informants is that it was not uncommon to find these speakers using [i:] when pronouncing DRESS. Thus, the analysis of the data of fifth and sixth generation speakers revealed that DRESS has not settled yet but continued to raise after KIT centralised. As the majority of the speakers use this variant in the fifth and sixth generations, there seems to be a steady increase in DRESS raising, which constitutes a significant difference compared to third and fourth generation speakers. Therefore, it serves as evidence that DRESS raising is still in progress.

## 9. Conclusion

The present paper has investigated the evolution and realisation of the TRAP, DRESS and KIT vowels in NZE. To this end an auditory analysis of speech samples of ten male New Zealanders born between 1890 and 1990 has been carried out. The purpose of the current study was to determine whether the unique pronunciation of the NZE short front vowels is the result of new-dialect formation or a short front vowel shift, and it has been assumed and proven that both hypotheses have equivalently important roles in this process. The second aim of the study was to investigate the short front vowel shift and it has been hypothesised and demonstrated that it is a push chain in progress consisting of three sequential steps. The experiment has also confirmed that the DRESS vowel is still raising, which suggests that the vowel chain shift is still in progress.

This work contributes to the existing literature on the characteristics of NZE by providing the results of an empirical investigation regarding the most salient pronunciation features of NZE in a one-hundred-year long period. Before this study, this period, consisting of four generations, had not been researched. Also, prior to this paper, researchers focused on one or two aspects of this linguistic phenomenon, while here an empirical investigation has been carried out considering more aspects. The small sample size did not allow the accomplishment of a quantitative experiment, and the study is limited regarding gender differences because only the speech of male speakers was analysed. Also, more information could be gained by carrying out the acoustic analysis of the NZE short front vowels, and it would help us to assess a greater degree of accuracy on the phonetic space these vowels occupy. In spite of its limitations, the study certainly adds to our understanding of the evolution of the NZE short front vowels. Indeed, these limitations can rather be seen as indications that this would be a fruitful area for further work.

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Language Change:  
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