Ethnic variation in its social context:

Evidence from the English of Chinese Australians

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Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of the author's knowledge, it contains no material previously published or written by another person, except where due reference is made in the text.

The proposal for the research presented in this thesis received human research ethics approval from the Australian National University Human Research Ethics Committee, Protocol Reference Number 2015/088. This research was conducted with the Sydney Speaks project, as part of the Australian Research Council Centre of Excellence for the Dynamics of Language.

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Dedication

For my late grandma, Simei Wu (1934-2021).

While you witnessed the beginning of my PhD journey, you did not live to see its completion. Your love and encouragement have significantly influenced the person I am today. The joyful and educational moments we shared will forever hold a special place in my heart. I am profoundly grateful for everything you contributed to my life. Though physically absent, your spirit continues to guide and inspire me.

Abstract

Ethnicity has been a longstanding factor in studies of language variation and change (Labov, 1966), including in pioneering work in Australia with Australians of Greek and Italian background (Horvath, 1985). This thesis focuses on linguistic variation among a community that has received less attention, Cantonese-background Chinese Australians. Drawing from the Sydney Speaks project (Travis, 2014-2022), I compare spontaneous spoken English of Chinese Australians with the Anglo majority, to examine the role of ethnicity and other social factors, particularly social class, in conditioning variation.

Analyses centre around three linguistic variables, which exhibit varying degrees of change, social salience, and typological differences across English and Cantonese—the realisation of the vowel in pre-vocalic definite article *the* (non-glottalised FLEECE vs. glottalised FLEECE vs. schwa); future temporal reference (*will* vs. *be going to*); and existential *there's* + plural argument (THERE'S vs. THERE ARE). Multivariate analyses reveal little in the way of ethnic differences, including for broad measures of ethnicity and for more fine-grained measures considering ethnic orientation. Furthermore, comparisons with a corpus of English spoken in Hong Kong (Bolton, 2002), reveal differences in the linguistic conditioning in Hong Kong English, further supporting that Chinese Australians are conforming to Australian norms. However, differences do emerge for social class, and comparisons across social class reveal a strong alignment with middle class Anglo Australian norms among Chinese Australians.

These findings highlight the importance of considering social context in understanding ethnic differentiation in sociolinguistic patterns, and taking account of the intersection between language and social structures.

List of Abbreviations

AAE	African American English
AIC	Akaike Information Criterion
ASR	Special Administrative Region
BAE	British Asian English
BIC	Bayesian Information Criterion
BNC	British National Corpus
CVS	Canadian Vowel Shift
E/E CTP	Epistemic / Evidential Complement-Taking Predicate Phrase
EO	Ethnic Orientation
EOI	Ethnic Orientation Index
HCA	Hierarchical Cluster Analysis
HK	Hong Kong
ICE	International Corpus of English
LaBB-CAT	Language, Brain & Behaviour Corpus Analysis Tool
LMC	Lower Middle Class
MC	Middle Class
Meim-R	Multi-Group Ethnic Identity Measure-Revised
MLE	Multicultural London English
n	Number
NP	Noun Phrase
NYC	New York City
NYCE	New York City English
PCA	Principal Component Analysis
SD	Standard Deviation
TIMIT	Texas Instruments/Massachusetts Institute of Technology
UK	United Kingdom
VOT	Voice Onset Time
WC	Working Class
WCSNZE	Wellington Corpus of Spoken New Zealand English

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Chapter 1 Introduction

1.1 Research aims

As the influx of migrant groups or ethnic minorities into urban centres increases, studies of language use in societies that do not account for these groups "may well overlook important sources of change" (Horvath, 1991, p. 305), leading Horvath to propose some thirty years ago that interrogating the effect of immigration on language use would contribute to our understanding of language variation and change (Horvath, 1991, p. 314). Many sociolinguistic studies have investigated the role of ethnic diversity in language variation and the propagation of language change and have found that migrants play an important role in language change (e.g., Cheshire, Kerswill, Fox, & Torgersen, 2011; Clyne, 2000; Clyne, Eisikovits, & Tollfree, 2002; Hoffman, 2010; Hoffman & Walker, 2010; Labov, 1966, 1972a; Sharma, 2011). For example, Italian and Greek teenagers in Sydney were found to be leading their generation in a shift to more "general" vowel realisations of Australian English (Horvath, 1985, pp. 91-94). The central role of ethnic minorities as leaders of change has also been observed by Cheshire and colleagues across a range of variables in their work on Multicultural London English (MLE) in the United Kingdom (UK) (Cheshire, Kerswill, Fox, & Torgersen, 2011; Fox, 2015). However, in other contexts, ethnic minorities have instead been found to lag in change, or to proceed in parallel with the majority community (Hoffman & Walker, 2010; Van Meel, Hinskens, & van Hout, 2013, 2018; Wong & Hall-Lew, 2014). Several factors contribute to the diverse roles of ethnic minorities in language change, including cultural and ethnic diversity in their neighbourhoods with strong social network ties (Cheshire, Fox, Kerswill, & Torgersen, 2008; Cheshire, Kerswill, Fox, & Torgersen, 2011), transfer effects from their heritage languages (Auer & Siegel, 2021), and their ethnic orientation towards their heritage culture and lifestyle (Hoffman & Walker, 2010; Nagy, Chociej, & Hoffman, 2014; Newlin-Łukowicz, 2016; Wong, 2007).

One factor that has received less attention in this line of research is the intersection of ethnicity and social class. Previous research frequently centred on the same class groups or neighbourhoods with similar socioeconomic statuses (see review in Britain, 2018, p. 297). It has been noted by Eckert (2008) that ethnolects, linguistic varieties spoken by ethnic minorities who are native speakers of the majority language, whether or not they are bilingual in the community language (Clyne, 2000, p. 86), are typically associated with working class speakers. This has been found to be the case in some studies. For example, studies on

Multicultural London English in the UK have highlighted the development of MLE by ethnic minorities living in socioeconomically deprived multiethnic neighbourhoods (Cheshire & Fox, 2009; Cheshire, Fox, Kerswill, & Torgersen, 2008; Cheshire, Fox, Kerswill, & Torgersen, 2013; Cheshire, Kerswill, Fox, & Torgersen, 2011; Fox, 2015; Gabrielatos, Torgersen, Hoffmann, & Fox, 2010). This group can be contrasted with British Asian English speakers in the UK, who are often of higher socioeconomic status, display strong social mobility and maintain transnational business relationships with their home country, India (Fox & Sharma, 2017; Sharma, 2011, 2016, 2021a, 2021b). The findings reveal that while Multicultural London English shows innovative features led by the ethnic minorities, British Asian English speakers tend to align with the norms of Standard Southern British English, favouring standard and middle class forms of linguistic variation to assert their elite identity (Sharma, 2021b, p. 56). Thus, these studies reveal that social class plays an important role in ethnic variation, supporting earlier pioneering research conducted by Laferriere (1979) on Italian and Jewish Americans. Laferriere (1979, p. 612) observed that "ethnic divisions…are paralleled by educational divisions. It should follow that occupational grouping will also be parallel to ethnic division". Furthermore, social class has been found to relate to social network ties. Speakers of Multicultural London English typically have dense network connections within their neighbourhoods (Cheshire, Fox, Kerswill, & Torgersen, 2008), resulting in similar language features and linguistic repertoires across different ethnic groups and the formation of a multiethnolect (cf., Clyne, 2000; Clyne, Eisikovits, & Tollfree, 2001; Clyne, Eisikovits, & Tollfree, 2002). In contrast, speakers of British Asian English often exhibit weaker social network ties but stronger transnational collaboration (Sharma, 2011, 2017, 2021b; Sharma & Sankaran, 2011). Thus, they form a socially stratified group with a strong orientation towards the middle class norms within the broader context (Sharma, 2021b).

Nonetheless, there has been some research on class stratification within ethnic minority groups, and when such studies are conducted, distinct roles of ethnic minorities in language change become apparent. For example, King (2021) conducted a study in Rochester, New York, examining African Americans, including both mobile and non-mobile Black professionals, and discovered that the shift in the realisation of the BAT vowel, including its lowering and retraction, is predominantly driven by young, upwardly mobile Black professionals who plan to relocate for work. Their motivation is rooted in their orientation towards "supralocal economic interests" (p. 165). In contrast to their working class counterparts, who historically exhibited a raised BAT vowel in African American speech, the young mobile Black professionals have shifted away from this older realisation. This shift is interpreted as a way to "index their

positions in a new socioeconomic landscape, contrasting with the industrial past of their elders" (p. 174). Benheim and D'Onofrio (2024) examined two Jewish communities in Chicago. One of these communities resides in West Rogers Park/Skokie/Lincolnwood, an area historically characterised by lower socioeconomic status in comparison to the wealthier northern suburbs and city neighbourhoods. The results revealed distinct vowel patterns in these two communities, influenced by social class. Residents of West Rogers Park/Skokie/Lincolnwood follow the Northern Cities Vowel Shifts, which have been associated with lower socioeconomic status (p. 151), in producing higher and fronter TRAP, fronter LOT, higher KIT, and backer GOOSE vowels compared to other Jewish speakers (p. 144). It should be noted that the absence of a comparison with the White or Anglo majority in these studies makes it difficult to determine the overall changes of these variables and their social evaluation in a broader context. Thus, these studies may have benefited from the contextualisation within a broader framework.

Examining these well-established ethnic communities in the United States underscores the intersection of ethnicity and social class in language variation and change. There is a call for "greater sensitivity to the intersectionality of language variation" in studying language use and ethnicity, as "variants are almost certainly not going to merely or even mainly index ethnicity per se, but potentially a localized, gendered, classed, age-constrained identity" (Britain, 2018, p. 297). To expand on this and address the gap, I investigate a growing but understudied ethnic community in Australia with a notably high socioeconomic status within Australian society – Cantonese-background Chinese Australians, in one of the largest cities in the country, Sydney. This group of Chinese Australians is well-educated, holds high-income occupations, and lives in the wealthier suburbs of Sydney. These social characteristics are relevant to their speech patterns. For instance, previous research conducted by the Sydney Speaks team has found that both Chinese Australian men and women tend to resemble the realisations observed in Anglo and Italian Australian women in producing General vowel realisations, and avoiding Broad diphthong realisations. This has been interpreted as evidence of their orientation towards overtly prestigious linguistic forms, aligning with the characteristics associated with middle class Australians and reflecting the high socioeconomic status within the Chinese community in Australia (Grama, Travis, & Gonzalez, 2021, p. 307). Thus, to contextualise the patterning among the Chinese Australians in this thesis, I make comparisons with that of the Anglo-majority population, and of speakers of Hong Kong English, as a contact variety, allowing me to assess the social evaluation of linguistic variables and potential language transfer effects from Cantonese.

Additionally, there has been a long tradition of examining ethnic variation in phonetic or phonological features (cf., Cox, Penney, & Palethorpe, 2023; Grama, Travis, & Gonzalez, 2020, 2021; Gross, Boyd, Leinonen, & Walker, 2016; Hoffman, 2010; Hoffman & Walker, 2010; Labov, 1966, 1972a; Meyerhoff, Birchfild, Ballard et al., 2020; Travis, Grama, & Purser, 2023). However, Cheshire (2005, p. 479) posited that

> *"the social dimension of variation is fundamentally different for phonological forms and syntactic forms. Because the form-meaning relation is arbitrary for phonological variants, speakers can use them to index their membership in different social groups; but because speakers use syntactic forms in the construction of discourse including, crucially, the conveying and construction of propositional and attitudinal meanings, the social embedding of syntactic variation is often more complex".*

The study of social conditioning of morphosyntactic variation is also more complicated than it is for features of the sound system as morphosyntactic variables are less frequent in speech and are subject to rich language-internal constraints (Cheshire, 2005, p. 480; Milroy & Gordon, 2003, p. 197; Rickford, Wasow, Mendoza-Denton, & Espinoza, 1995, p. 106). They have also been proposed to have "quite fixed social meanings associated with external facts like class and particularly education" (Eckert, 2018, p. 190), which may render them "less susceptible to change" (Cheshire, Kerswill, & Williams, 2005, p. 139). Hudson (1996, p. 45) puts forward what he describes as "a very tentative hypothesis": speakers may use phonological variation to signal the social groups to which they feel they belong, but actively try to suppress variation in syntax because it is the mark of cohesion in society.

More recently, there has been an increasing interest in exploring ethnic differences related to morphosyntactic features (cf., Cheshire & Fox, 2009; Fox, 2015; Gabrielatos, Torgersen, Hoffmann, & Fox, 2010; Sharma, 2021a; Travis & Torres Cacoullos, 2023; Walker, 2021). Given the interactions noted above for ethnicity and class, socially defined morphosyntactic variables may be particularly interesting to study from an ethnolectal perspective, as "there is a direct link between the syntactic constructions that speakers choose and their construction of discourse in social interaction" (Cheshire, Kerswill, & Williams, 2005, p. 141). Furthermore, studies of ethnic variation of morphosyntactic features would have new theoretical and methodological significance as "an analysis of morphosyntactic variation helps broaden our knowledge of the feature pool available for identity construction" (Staicov, 2020, p. 11). Investigating a combination of both phonological as well as morphosyntactic features may be

more advantageous as “such a combined approach will also shed light on questions of control and agency and can show if some variables are indeed more salient than others” (Staicov, 2020, p. 166) (see also Buchstaller, 2016).

To test the social differentiation and ethnic differences embedded in the English of Chinese Australians, I identify a set of linguistic variables for analysis. I include two morphosyntactic variables – future temporal reference (two variants: *be going to* vs. *will*) and existential *there's* + plural argument (e.g., *there's lots of people*; two variants: THERE'S vs. THERE ARE), and one morphophonological variable – the realisation of prevocalic definite article *the* (e.g., *the other*; three variants: non-glottalised FLEECE vs. glottalised FLEECE vs. schwa).

These variables are all undergoing change but are at different stages in terms of timing, allowing me to test for the participation of Chinese Australians in change. Specifically, for prevocalic definite article *the* (*the*+VOWEL hereafter), there is an ongoing shift in many varieties of English away from non-glottalised FLEECE (e.g., Cheshire, Kerswill, Fox, & Torgersen, 2011; Cox, Penney, & Palethorpe, 2023; Meyerhoff, Birchfild, Ballard et al., 2020) and this is a relatively recent change. Future temporal reference is a widely studied and long-standing feature across varieties of English, but the increased usage of *be going to* at the expense of *will* is ongoing, especially in the varieties of British English (e.g., Fehringer & Corrigan, 2015; Poplack & Tagliamonte, 1999; Szmrecsanyi, 2003, 2005; Torres Cacoullos & Walker, 2009). The change of *there's* + plural argument is nearing completion ((THERE'S) hereafter), with the newer form THERE'S being more frequent than THERE ARE in different English varieties (e.g., Britain & Sudbury, 2002; Hay & Schreier, 2004; Walker, 2007, 2015). Furthermore, the two morphosyntactic variables differ typologically between Cantonese and English. Cantonese does not have grammaticised tense marking or subject-verb agreement, features that exist in English. For these two variables, I test for possible substrate transfer effects by comparing with the speech patterning of Hong Kong English speakers (from the International Corpus of English-Hong Kong (Bolton, 2002)). Additionally, the variable (THERE'S) is socially salient, with a clear standard vs. non-standard distinction, while the same is not the case for future temporal reference and *the*+VOWEL, and thus these variables are of particular interest for the study of ethnic variation.

Regarding the findings on ethnic variation among these variables, the shift away from non-glottalised FLEECE for the prevocalic definite article *the* has been reported to be led by ethnic minorities or in ethnically diverse neighbourhoods in various English varieties (e.g., Cheshire, Kerswill, Fox, & Torgersen, 2011; Cox, Penney, & Palethorpe, 2023; Meyerhoff, Birchfild,

Ballard et al., 2020). Concerning future temporal reference, there is only one study examining ethnicity, comparing African American and Anglophone Canadians. This study found differences between the two groups in both usage rates and linguistic conditioning (Poplack & Tagliamonte, 1999). However, this variable has not been explored in Australian English. In the case of (THERE'S), younger ethnic minorities in Canada were identified as leading the increased usage of the singular form THERE'S (Walker, 2021). In Australia, younger speakers have also been observed to use a higher rate of THERE'S (Eisikovits, 1991), yet there has been no examination of ethnic variation in (THERE'S) to date. Thus, while more studies have examined ethnic variation in the prevocalic definite article *the*, fewer studies investigating ethnic variation in the other two variables exist. This thesis aims not only to consider the ethnic variation in these variables but also to explore interactions among ethnicity, class, and gender, and thereby to contribute further to discussions surrounding the role of ethnic minorities in language variation and change.

Specifically, this thesis investigates five research questions:

1) Are the three variables under consideration (*the*+VOWEL, future temporal reference, and (THERE'S)) currently undergoing change in Australian English, and what is the timing of those changes?
2) What are the similarities and differences between Chinese and Anglo Australians in taking up the change?
3) Do Chinese Australians with different degrees of orientation towards their ethnic heritage pattern differently in adopting these changes?
4) How would substrate transfer from Cantonese be manifest, and is there any evidence of this in the speech patterning of Chinese Australians?
5) How can the similarities and differences in the speech patterning between Chinese Australians and Anglo Australians be accounted for?

To answer these five research questions, I utilise the Australian English data sourced from the Sydney Speaks corpus. This corpus, comprising over one million words of spontaneous speech from recordings made in the 1970s (Horvath, 1985) and in the 2010s as part of the ongoing Sydney Speaks project (Travis, 2014-2022), allows for real-time and apparent-time comparisons. The Sydney Speaks corpus proves to be an ideal resource for a large-scale, empirical examination of the mentioned linguistic variables. Not only does it provide data recorded over different time periods, but it also includes a diverse range of speakers at these

two time points, encompassing men and women from various social classes representing some of Australia's major ethnic groups—Anglo-Celtic, Italian, Greek, and Chinese Australians.

For my thesis, I concentrate on the data collected in the 2010s and compare the language patterns of Chinese Australians with those of Anglo Australians of different age groups. This comparative analysis aims to contextualise the English spoken by Chinese Australians, allowing an investigation into the social nature of the change for each of the linguistic variables. In examining variation and change in these variables, I not only consider their usage rates but also consider their social and linguistic conditioning.

Additionally, I incorporate the International Corpus of English-Hong Kong (ICE-HK) (Bolton, 2002) to explore how the language transfer effects from Cantonese might be evident. This corpus comprises approximately one million words of written text and spoken data. To enable comparisons between the ICE-HK and Sydney Speaks corpora, I selected 90 face-to-face conversations from ICE-HK, totalling roughly 180,000 words. In ICE-HK, my focus is on speakers recorded in the 2000s, spanning different ages, as well as those living in Hong Kong whose first language is Cantonese.

By addressing these research questions, this thesis seeks to contribute to discussions around the role of ethnic minorities in language variation and change by exploring how this growing minority Chinese Australian community patterns in relation to the majority Anglo community; whether any differences are related to the degree to which they are connected with their ethnic heritage; and whether their place in broader social structures play a role.

1.2 Thesis structure

This thesis consists of eight chapters. The first chapter introduces the research aims and questions, and the structure of this thesis.

Chapter 2 reviews some of the prior research on ethnic variation, the role of ethnic minorities in language change, and the intersection between ethnicity and other social factors (e.g., age, gender, class) to contextualise this project. It also describes the migration history and social characteristics of the focus community of this study – Cantonese-background Chinese Australians, and reviews prior linguistic research on the Chinese community in North America and other countries.

Chapter 3 describes the methodology of this thesis. The analysis is guided by Variationist Sociolinguistics, so I describe the key theoretical and methodological underpinnings of this approach. I present the data of this thesis, which is from the Sydney Speaks corpora and the ICE-HK. I also detail the compilation of four measures of ethnic background, namely, ethnic orientation, social network, self-reported Cantonese proficiency, and the prevalence of Cantonese speakers in the neighbourhood. Then, I introduce the three linguistic variables for testing ethnic variation in the English of Chinese Australians and provide justifications for including them here. Finally, I introduce the three types of statistical methods used in this thesis: descriptive statistics, tree-based modelling, and mixed-effects logistic regression models.

Chapters 4, 5 and 6 serve as analysis chapters for prevocalic definite article *the*, future temporal reference, and (THERE'S), respectively. For the latter two variables, where ICE-HK data is available, the Sydney Speaks data and ICE-HK data are analysed independently. The results highlight differences in both the timing of change and the social conditioning of three linguistic variables. This assessment enables me to examine the similarities and differences in the speech patterns between Chinese and Anglo Australians across various linguistic variables, explore the potential manifestations of substrate transfer from Cantonese, and investigate the impact of the ethnic background of Chinese Australians. Specifically, the most recent change observed in Australian English is *the*+VOWEL. The Chinese Australians exhibit a higher usage rate of the newer variants, aligning the patterns with their middle class Anglo peers. Regarding the older change, future temporal reference, Chinese Australians tend to use *will* more than *be going to*, unlike their Anglo peers, resembling the language preference of middle class Anglos from the previous generation. This preference for *will* is associated with formality in language use. The change for (THERE'S) is the most advanced among the variables examined in this thesis, having been initiated in the 1970s, and approaching stability today. The class effect has diminished over time, resulting in the absence of a class effect among Young Adult Anglos. The Chinese Australians mirror their Anglo peers in not displaying a class effect. For all three variables, I assess the impact of ethnic background on the English spoken by Chinese Australians through regression models. This assessment is a critical inquiry as previous research has established relationships between ethnic background and the usage rates of linguistic variables (Hoffman & Walker, 2010). Here, I examine four measures, namely, ethnic orientation, social network, Cantonese proficiency, and the prevalence of Cantonese speakers in the neighbourhood. However, there are no effects of ethnic background observed in these measures through regression models. Therefore, I revisit them in Chapter 7.

As a final analysis chapter, Chapter 7 reexamines the impact of ethnic background on the English spoken by Chinese Australians through correlation tests. Correlation tests are more adept at handling our smaller dataset, as we only have 22 Chinese Australians in the sample, and not all of them produce all three variables under examination. A series of correlation tests confirm that none of these measures correlated with any of the linguistic variables. However, there was a correlation between ethnic orientation and social class, with Chinese Australians with a stronger orientation towards Chinese culture and lifestyle tending to occupy the higher end of the social class spectrum, which is relevant to the observed language patterns in the English spoken by Chinese Australians.

Chapter 8 concludes this thesis by summarising the main research findings in relation to the research questions, laying out the future directions, and clarifying the contributions of this thesis to the research field.

Chapter 2 Literature Review

2.1 Ethnic variation

Interest in the speech of ethnic minorities has led to interest in what are termed “ethnolects”. Carlock and Wölck (1981) were credited with an early exploration of ethnolects, specifically in their experimental study conducted in Buffalo, but the term “ethnolects” was defined by Clyne (2000, p. 86) twenty years later as “varieties of a language that mark speakers as members of ethnic groups who originally used another language or distinctive variety”. Ethnolects are often associated with second or third generation immigrant communities “as a transitional stage between the non-native English of immigrants and full integration into the English-speaking community” (Boberg, 2004, p. 539). It is argued that in immigrant families, an ethnolect, like a community language, is employed by the second or later generations who may or may not speak the community language to communicate with insiders, including their parents, grandparents, or peers of the same ethnic background (Clyne, Eisikovits, & Tollfree, 2001, p. 225). It is believed that an ethnolect “provides a means for those who may no longer be fluent in their ethnic language to continue to express their identification with, and sense of belonging to, their ethnic group” (Clyne, Eisikovits, & Tollfree, 2001, p. 227). However, an ethnolect is not attributable to incomplete acquisition or imperfect learning of the majority language (cf., Cheshire, Fox, Kerswill, & Torgersen, 2008), nor is simply first language interference (Clyne, Eisikovits, & Tollfree, 2002, p. 133). This has been empirically demonstrated by Hoffman and Walker (2010), who compared first and second generation Italian and Chinese Canadians in the same speech community and found that second-language features in the speech of first generation immigrants were not carried over into the second generation (see also Hoffman, 2010).

Ethnolectal features do not apply to every group member in the same way (Benor, 2009, 2010). It is hypothesised that those with a stronger orientation to their ethnic community are more likely to “show more ethnic marking in their language than those who have chosen to assimilate within the dominant group” (Clyne, Eisikovits, & Tollfree, 2001, p. 226). There is some empirical support for this proposal. For example, Hoffman and Walker (2010, p. 56) found that for Chinese and Italian Canadians, degree of participation in the Canadian Vowel Shift (CVS) correlated with ethnic orientation – those with higher ethnic orientation are more likely to follow older norms, while those with lower ethnic orientation are more likely to adopt newer norms. In another study with four second generation Chinese Americans in New York City (NYC), it was

found that their use of features characteristic of NYC English, specifically [ɔ]-raising and [æ]-tensing, was inversely related to their level of ethnic orientation, as measured by their social network and lifestyle (Wong, 2007, p. 227). In other words, the more they identified with their Chinese heritage, the less likely they were to adopt these linguistic features of NYC English. Another study of ethnic minorities in NYC reported that Polish Americans with a stronger orientation toward Poland and the Polish community in NYC exhibited higher rates of the Polish-identified feature, TH-stopping, and participated in sound changes in NYC English, such as /ɔ/-lowering and the nasal split (Newlin-Łukowicz, 2016, pp. 109-110).

Ethnolects are not solely used by ethnic group members or by people who can speak a community language, but instead, are argued to serve as "a symbol of group identity" or as a vehicle for expressing multiple identities (Clyne, Eisikovits, & Tollfree, 2002, p. 133). Thus, in some cases, monolingual Anglo speakers or dominant ethnic groups might appropriate certain ethnolectal features from ethnic minorities (Clyne, 2000, p. 87). This is evident in the development of the multiethnolect, Multicultural London English (e.g., Cheshire, Kerswill, Fox, & Torgersen, 2011). For example, Fox (2007) found that white Anglo male adolescents with multiethnic friendship networks picked up features used frequently by their Bangladeshi male peers in London (specifically their use of reduced *the* [ðə] versus standard *the* [ðiː] of the English definite article in prevocalic position).

Ethnolects and multiethnolects largely arise from linguistic innovations and restructuring led by immigrant groups or multilingual/multiethnic (friendship) groups living in urban centres with intense language contact (see Clyne, 2003). For example, representative multiethnolects are found in urban and multicultural metropolises where very large-scale immigration has been seen, including Multicultural London English in the UK (Cheshire, Fox, Kerswill, & Torgersen, 2008; Cheshire, Fox, Kerswill, & Torgersen, 2013; Cheshire, Kerswill, Fox, & Torgersen, 2011), *Straattaal* 'street language' in the Netherlands (Nortier, 2000), *Rinkebysvenska* 'Rinkeby-Swedish' in Sweden (Kotsinas, 1988), *Kiezdeutsch* 'neighbourhood language/hood language' in Germany (Wiese, 2009, 2015), *Jallanorsk* 'Oslo multiethnolect' in Norway (Svendsen & Røyneland, 2008) and *Københavnsk Multietnolekt* 'Copenhagen multiethnolect' in Denmark (Quist, 2008). The specific reasons proposed to account for the rise of (multi)ethnolects vary with the social context. One common theme relates to language transfer, and "the indirect effect of multiple language contact" (Cheshire, Fox, Kerswill, & Torgersen, 2013, p. 63; see also Kotsinas, 1988, p. 137), or, relatedly, "group second language acquisition" (Winford, 2003, pp. 235-237). Another relates to ties with ethnic heritage, such as "the extent to which young people's ways of speaking index positive attitudes towards their

neighbourhood" (Cheshire, 2020, p. 323; see Labov, 2001 for more details), or ethnic orientation (Hoffman & Walker, 2010). And a third related proposal concerns social network. For example, Cheshire, Kerswill, Fox and Torgersen (2011, p. 152) argued that the multilingual working class neighbourhoods or districts with large multiethnic groups tend to have denser social network ties and weaker residential segregation promoting multiethnolectal variation (see also Cheshire, Fox, Kerswill, & Torgersen, 2013, p. 67).

In this study, I shift the focus to a growing but understudied ethnic group in Australia, second-generation Cantonese-background Chinese Australians. I also approach the inquiry into the role of ethnic minorities in language variation and change from a different angle, examining the similarities and differences in both usage rates and conditioning among Chinese Australians, the Anglo majority, and speakers of Hong Kong English.

2.2 Ethnicity and language change

The effect of ethnicity on language change has been tested by many studies, but the findings vary depending on the social context and on the linguistic nature of variables. Some studies have found that ethnic minorities lead in change, especially those living in multiethnic urban centres with a high influx of immigration (e.g., Cheshire, Kerswill, Fox, & Torgersen, 2011; Gross, Boyd, Leinonen, & Walker, 2016; Horvath, 1985), while others have found that ethnic minorities do not exhibit distinct features of language use. Instead, they pattern like their Anglo peers or adhere to the regional norms of language change (e.g., Wong & Hall-Lew, 2014). And other studies have found that ethnic minorities lag behind in some changes, for instance, for vowel realisations among Italian Canadians in Montreal (Boberg, 2014, p. 68) and retention of dialect features among Moroccan and Turkish Dutch residents in Holland (Van Meel, Hinskens, & van Hout, 2013, p. 306). Thus, these studies present varying findings, indicating distinct patterns among different groups. However, the reasons behind these differences and the factors influencing or determining them remain unclear, so the relationship between ethnicity and language change is worth further research.

One of the first studies to demonstrate ethnic minorities leading in change is that by Horvath (1985). This study explored sociolects in Sydney and focused on the effects of generation (first and second generation) and ethnicity (Anglo, Greek and Italian) on variation and change in Australian English. She found that in general first generation immigrants used accented speech, while their children patterned with their Anglo peers, but were ahead in some ongoing changes. Specifically, for the socio-stylistic variation along the Broad / General / Cultivated

continuum (cf., Mitchell & Delbridge, 1965), the Italian and Greek Australians were observed to be moving away from both Broad speech, associated with the working class, and Cultivated speech, associated with the middle class and British Received Pronunciation (Horvath, 1985, p. 94). In comparison, the Anglo Australians showed greater concentration in Broad vowel realisations. The Italian Australians in particular were reported to "jump ahead of the Anglo-Celtic teenagers by moving not one but two steps away from the ends of the continuum" to a more General sociolect (Horvath, 1991, p. 315). Horvath proposed that Italian and Greek teenagers were distancing themselves from their parents who were first generation immigrants with accented vowels situated at the Broad or Cultivated ends of the continuum, and she interpreted General vowel realisations to be "the safest ground for 'sounding' Australian" for the second generation ethnic minorities (Horvath, 1985, p. 176). And more recently, it has been shown that Chinese Australians lead the continued change of diphthong realisations away from what were formerly male, working class, or Broad realisations (Grama, Travis, & Gonzalez, 2021). Although Anglo and Italian Australians demonstrate significant gender differences, with men typically producing broader diphthong realisations compared to women, Chinese Australians show a deviation from the prevailing Australian gender norms. Both Chinese men and women tend to resemble the realisations observed in Anglo and Italian women in producing General vowel realisations, and avoiding broader diphthong realisations. This has been interpreted as evidence of their orientation towards overtly prestigious linguistic forms, aligning with the characteristics associated with middle class Australians and reflecting the high socioeconomic status within the Chinese community (Grama, Travis, & Gonzalez, 2021, p. 307).

Along similar lines, Cheshire and colleagues investigated Multicultural London English in the UK, exploring its usage by both ethnic minorities and the associated Anglo groups who were interconnected within the same networks (Cheshire, 2020; Cheshire, Fox, Kerswill, & Torgersen, 2008; Cheshire, Fox, Kerswill, & Torgersen, 2013; Cheshire, Kerswill, Fox, & Torgersen, 2011). Examining ethnic variation at different linguistic levels, including the sound system (e.g., vowel changes, definite article realisation), morphosyntax (e.g., levelled agreement patterns with past tense *be*) and discourse (e.g., a new quotative marker *this is* + speaker), they found that ethnic minorities of diverse backgrounds were leading in a set of changes, which were also being picked up by Anglos in their same networks (Cheshire, Fox, Kerswill, & Torgersen, 2008, pp. 8-19; Cheshire, Kerswill, Fox, & Torgersen, 2011, pp. 172-189). In Sweden, Gross, Boyd, Leinonen and Walker (2016) investigated young speakers of immigrant and non-immigrant backgrounds in Stockholm and Gothenburg, and found that

Gothenburg speakers with foreign-born mothers were distancing themselves from their peers with Swedish-born mothers and following a change taking place in Stockholm, towards a more open realisation of the /ɛ:/ vowel, making them the leaders in bringing this innovation into Gothenburg speech. They argued that speakers with immigrant backgrounds "are not using foreign features to mark their difference but rather features that are undergoing widespread changes" in the broader community to mark their local identity (Gross, Boyd, Leinonen, & Walker, 2016, p. 243).

As noted above, ethnic minorities are not always leading in change. Studies of ethnic variation in Holland have found that ethnic minorities are lagging in the widespread change of the new realisations of the Dutch diphthong /ɛi/. Specifically, in recordings of two-party conversations with young people from three different groups, Moroccan Dutch, Turkish Dutch and White Dutch, Van Meel and colleagues found that both groups of ethnic minorities "[were] united in their embracing the older local dialect variants of the diphthong /ɛi/" (Van Meel, Hinskens, & van Hout, 2013, p. 306). They proposed that this diphthong had developed into an ethnic marker, while the White Dutch were moving away from this older form, and targeting the more prestigious standard forms of the diphthong /ɛi/ (Van Meel, Hinskens, & van Hout, 2014, p. 69). In Canada, Chinese Canadians lag in the Canadian Vowel Shift, especially those with stronger orientation to their Chinese heritage and lifestyle (Hoffman, 2010; Hoffman & Walker, 2010). In Australia, while Greek and Italian teenagers in the 1970s led in the lengthening of word-final *–er*, an ethnolectal marker associated with the working class, this change did not persist into the next generation. Today, a shorter *–er* has become a shared community-wide feature among Chinese Australians and other ethnic groups, associated with a loss of the class effects of *–er*, regardless of their ethnic background (Grama, Travis, & Gonzalez, 2020, pp. 361-362; see also Sheard, 2022).

In other studies, it has been shown that ethnic minorities are not markedly distinct from the majority group but participate in broader patterns of regional variation and change. For example, in the United States, Wong and Hall-Lew (2014, p. 27) found that Chinese Americans of Cantonese heritage in NYC and San Francisco showed different patterns of dialectal variation in American English such that they pronounced the BOUGHT vowel in ways that were more similar to their respective regional patterns than to one another. In Germany, Auer and Siegel (2021, p. 25) found no ethnic differences in gender agreement in determiners for young German-born people of Turkish and Balkan background. In Holland, Van Meel, Hinskens and van Hout (2018, p. 179) found that, while youths of Turkish and Moroccan background were lagging in the use of new realisations of the diphthong /ɛi/, they were taking part in existing

patterns of regional and social variation in the realisation of the Dutch /a:/ - /ɑ/ vowel pair contrast. Ethnic minorities in Holland play different roles in these variables because "the 'traditional' urban dialects are being recycled to become an ethnolect marker" (Van Meel, Hinskens, & van Hout, 2014, p. 69). Consequently, they tend to use "linguistic features with urban and socially low indexicalities" (p. 69), including the older urban and local realisations of the diphthong /ɛi/ and the emerging urban vowel contrast between /a:/ and /ɑ/.

So far, we have only been considering changes in rates of use, but a change in the linguistic system is seen not only in changes in rates, but also in conditioning (cf., Poplack & Tagliamonte, 1999). In Canada, examining Italian and Chinese Canadians in comparison with the British/Irish Canadians, Hoffman (2010), Hoffman and Walker (2010) and Walker (2021) found changes in rates of participation in the Canadian Vowel Shift, t/d deletion, and (THERE'S) in the speech of ethnic minorities, but no change in linguistic conditioning, leading them to propose that rates of use may be serving to mark their ethnic identities. However, in her study of Punjabi-heritage British Asians, Sharma (2021a) found changes in both rates and conditioning in the grammar, including *was/were* levelling, *a/an* allomorphy, *the* allomorphy and the quotative system.

2.3 Ethnicity and other social factors

The patterning of ethnic minorities in relation to broader patterns of variation and change appears to be related to both the relationship between the ethnic minorities and other social factors, such as gender and class, and the social meaning associated with relevant linguistic variables. Thus, there is a call for "greater sensitivity to the intersectionality of language variation" in studying language variation and ethnicity (Britain, 2018, p. 297).

It has been proposed that ethnolects are typically associated with working class speakers (Eckert, 2008). This has been found to be the case for Multicultural London English (MLE), for example, which is spoken in underprivileged and multiethnic neighbourhoods where close kin and dense neighbourhood ties are maintained (Cheshire, Kerswill, Fox, & Torgersen, 2011, p. 153). This is in contrast, however, to another ethnolectal variety, British Asian English (BAE), spoken by second generation Indian Londoners who tend to be of the lower middle class (cf., Fox & Sharma, 2017; Sharma, 2021a, 2021b). The younger second generation BAE speakers follow the norms in Standard Southern British English in using low rates of the non-standard variants for *was/were* leveling and indefinite article allomorphy, distinct from their parents' non-native speech in which stigmatised uses were more common constructing "an upwardly

mobile, globalised Asian identity, very different from the personae associated with MLE, and not clearly predicted by frequencies in parent or same-age cohorts" (Sharma, 2021a, p. 69). The distinction between MLE and BAE leads Sharma to conclude that "social class – whether active class affiliation or simply access to variants – plays an important role" in the speech patterning of ethnic minorities, even within the same city (Sharma, 2021a, p. 65).

Related to class effects are intersections observed between ethnicity, education level and neighbourhood density. Boberg (2014, p. 70) examined vowel realisations in the English of 93 Canadians of British, Italian and Jewish descent in Montreal, and found that the Jewish Canadians were leading or were participating in "many native Canadian features". This was especially so for Canadian Raising of MOUTH, and the fronting of GOOSE and GOAT vowels. Italian Canadians, on the other hand, generally had not acquired these features – they were resisting fronting these vowels (Boberg, 2014, p. 68), preferring "the local, covert prestige and symbolic masculinity of distinctively Italian-sounding speech" (Boberg, 2014, p. 77). He argued that because of the relative segregation of ethnic communities (few British/Irish speakers live in the Jewish and Italian neighbourhoods and few Jewish speakers live in the Italian-dominated eastern end of Montreal), distinct ethnolectal features emerged in the speech of each community (see also Boberg, 2004, p. 561). Furthermore, Boberg proposed that level of education influenced the distance of each ethnolect from the mainstream variety of Montreal English, stating that "not only did the Jews generally arrive earlier than the Italians, they also had earlier access to higher education, and therefore exposure to mainstream, middle class, Canadian English" (Boberg, 2004, p. 563). Thus, neighbourhood concentration, social network ties, and level of education motivated ethnic minorities in Montreal to draw on different linguistic resources to mark their sense of belonging in the society.

Social meaning may also be relevant, and in this regard, it may also be more complex (e.g., Eckert, 2018; Fought, 2006). For instance, Fought (2002)'s work on Mexican Americans found that gang status was an important social factor such that "what the gang members favor, the non-gang speakers reject" (Fought, 2002, p. 150). However, it was not gang status alone that was found to condition the patterning for participants in her study, but rather, gang status in interaction with gender and class in that "women and non-gang members are more likely to use variants from the majority community as part of their linguistic expression of identity" (Fought, 2002, p. 131). Thus, Fought (2002, p. 129) found that for GOOSE-fronting, the non-gang working class and the gang-affiliated middle class speakers were fronter than the gang-affiliated working class and the non-gang middle class speakers; for TRAP-backing, female non-gang speakers backed more than male gang speakers. In a study examining working

class White and African American speakers in Bakersfield, California, it was discovered that while White speakers display patterns consistent with previous /s/ studies—where women tend to use a more fronted variant than men—African American speakers show no significant difference between genders (Calder & King, 2022, p. 613). Thus, in Bakersfield, the realisation of /s/ "indexes co-constituted personae that stand at the intersection of race, gender, and other dimensions of identity, and that are locally relevant to particular groups of speakers in specific sociohistorical and geographic contexts" (Calder & King, 2022, p. 606). In Rochester, New York, King (2021) conducted a study examining African Americans, encompassing both mobile and non-mobile Black professionals. The research revealed that the shift from a raised BAT vowel to a lowered one is primarily propelled by young, upwardly mobile Black professionals intending to relocate for work. This shift is interpreted as a means to "index their positions in a new socioeconomic landscape, contrasting with the industrial past of their elders" (p. 174). In Australia, social meaning of the intersection of class, gender and ethnicity has also been reported. For example, female Greek Australians were reported to be the most differentiated group in leading in word-final *-er* lengthening (Kiesling, 2005) and female Lebanese Australians with high ethnic orientation used longer voice onset time (VOT) of the voiceless stops /p, t, k/ and darker /l/ word-finally than Lebanese men with high ethnic orientation (Clothier, 2019, p. 1891; Clothier, 2020, p. 163). According to these studies, the intersectionality of social factors and their multifaceted social meanings in language variation and change suggest that variation within ethnic groups is highly unlikely to solely or primarily represent ethnicity itself. Instead, they might signify a specific, localised identity influenced by gender, social class, and age constraints (Britain, 2018, p. 297).

Addressing the scarcity of studies that explore different class groups within ethnic communities, the research conducted by the Sydney Speaks project (Travis, 2014-2022) has significantly advanced this area of study. It has revealed that ethnicity indeed exhibits intersections with other social factors (Grama, Travis, & Gonzalez, 2020, 2021; Qiao & Travis, 2022; Travis, Grama, & Purser, 2023; Travis & Torres Cacoullos, 2023). This project includes Greek, Italian, and Chinese Australians. In terms of gender effects, the Anglo and Italian Australians exhibited similar "robust gender differences" for diphthong realisations – men produced lower and backer FLEECE and FACE vowels than women, while the Chinese Australians were not subject to a gender effect (Grama, Travis, & Gonzalez, 2021, p. 303). Instead, in line with their present socio-economic status (Grama, Travis, & Gonzalez, 2021, p. 303), the Chinese Australians were orienting to the overtly prestigious linguistic norms of middle class Australians (higher and fronter FLEECE and FACE) – consistent with Horvath's

proposal of “sounding Australian” (Horvath, 1985, p. 176). Another change has been the lengthening of word-final *-er*, which is believed to have spread from Greek and Italian teenagers in the 1970s, to working class women for the next generation, demonstrating a tie between ethnic minorities and the working class (Grama, Travis, & Gonzalez, 2020, p. 346). Today, in the speech of young adults in the 2010s, the change of a longer word-final *-er* has been adopted across the community, encompassing Anglos, Italians, and the Chinese, marking a loss of its previous association with the working class (p. 359). Among this young adult group, Chinese Australians produce a slightly shorter *-er*, consistent again with their middle class orientation (p. 362). Regarding (ing), there was an adolescent peak in the 1970s in that teenagers used a higher rate of the vernacular form, alveolar, compared to the adults (Travis, Grama, & Purser, 2023, p. 446). In the 2010s, adult Italian Australians retained similar high rates of alveolar observed in 1970s teens, differing from adult Anglos in the 2010s, who have shifted away from the vernacular (p. 455). This has been explained as a working class association among adult Italian Australians with the vernacular alveolar form. However, young adult Italians have aligned their behaviour with hegemonic norms, exhibiting a rate of the vernacular similar to their Anglo peers. For this young adult group, Chinese Australians exhibit the lowest usage rate of the vernacular form (p. 456). This suggests a departure from the speech norms associated with working class speech in this high socioeconomic community.

Taken together, the role of ethnic minorities in language variation and change varies across different studies and linguistic variables, being driven by multiple factors, including the social and linguistic nature of variables, and the relationship of ethnic minorities to broader society, including socioeconomic status, social network, geographical locality, etc. For example, in Australia, Italian and Greek Australian teenagers with immigration backgrounds were distancing themselves from their foreign accented parents and were leading the widespread change (cf., Horvath, 1985); the second-generation Chinese Australians lead change towards overtly prestigious vowel realisations, but lag in longer word-final *-er* and the use of the vernacular form of (ing) that are associated with the working class (Grama, Travis, & Gonzalez, 2020, 2021; Travis, Grama, & Purser, 2023). Along similar lines, the younger second-generation British Asian English speakers, a lower middle class oriented community, follow the norms of Standard Southern British English in using low rates of non-standard grammatical variants, which is distinct from their parents’ non-native speech (Sharma, 2021a, p. 69), while the Multicultural London English speakers, a working class community, the opposite is true for them in speech patterns. In Canada, Italian Canadians were distancing themselves from the speech patterning set by British/Irish Canadians as a newer community while Jewish

Canadians, who have a longer immigration history and show stronger integration with the British/Irish neighbourhoods, were leading in most of the widespread change of vowels (Boberg, 2014, pp. 68-70).

Additionally, the constructivist approach, as developed and applied (e.g., Becker, 2014; Benor, 2010; Hoffman & Walker, 2010; Nagy, Chociej, & Hoffman, 2014; Newlin-Łukowicz, 2016; Staicov, 2020), considers ethnicity to exist along a continuum, with members of the same ethnic community orienting to their ethnicity to varying degrees. Consequently, recent research has employed different methods to measure ethnicity. I will delve into more studies following this line of research in Section 2.5.

In summary, these studies show that ethnicity does not exist as a monolithic category; ethnicity alone may not have sufficient explanatory power for the speech patterning of ethnic minorities, and, the wider social context, such as class, gender and social network, should be taken into account. Furthermore, different ethnic groups show different social and linguistic patterns; thus, understanding their immigration histories is necessary before probing into their speech patterns.

2.4 Ethnic diversity in Australia

2.4.1 Immigration history

Though Australia is today a majority English-speaking country, there are over 400 separately identified languages spoken at home, including immigrant and indigenous languages (Australian Bureau of Statistics, 2021). In 2021, approximately 7.5 million immigrants were living in Australia, that is, 29.1% of the population who were born overseas[1].

Another measure of ethnic diversity that is available from the Australian Census data is language used at home (cf., Jupp & Clyne, 2011, p. 22). The most recent national census currently available shows that in 2021, 22.3% of Australians spoke a language other than English at home compared with just 12% of the population in 1981 (Australian Bureau of Statistics, 1981, 2021). Ethnic diversity in Australia has been changing over time in terms of its makeup of immigration groups. In the post-World War II era, White Europeans were the

[1] Australia's Population by Country of Birth, 2021 | Australian Bureau of Statistics (abs.gov.au)

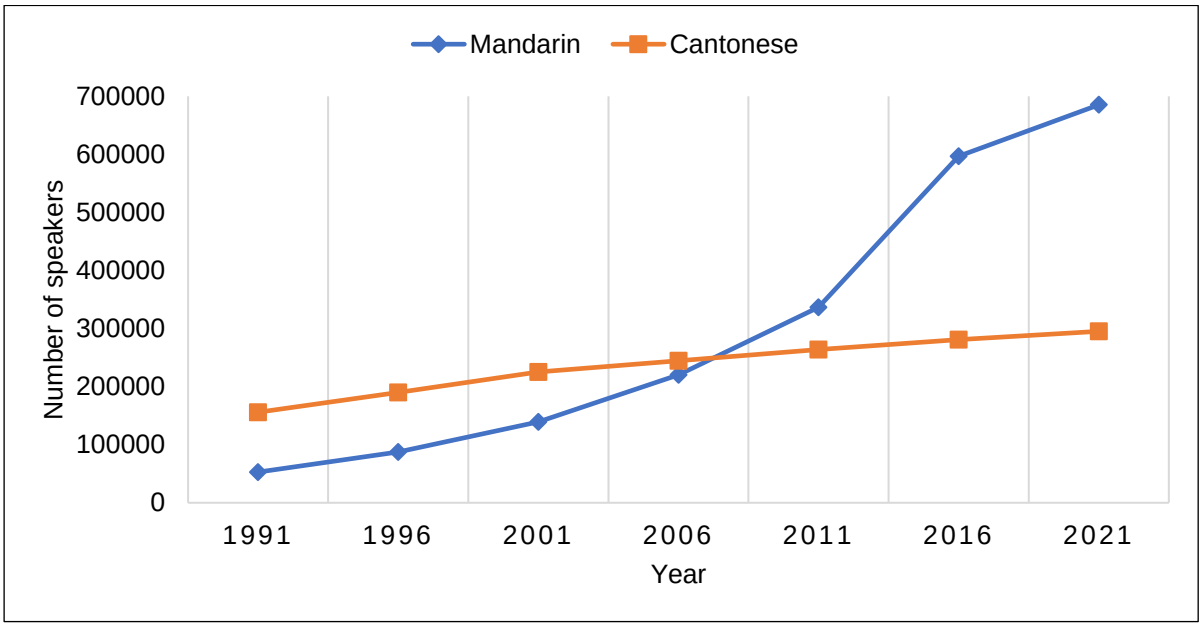
largest group of incoming settlers. This lasted for several decades and only from the 1970s, with the removal of the White Australia Policy, there were continuous immigrants coming from the Middle East, Africa, and in particular from Asia (Clyne & Kipp, 1997; Jupp, 2001; Willoughby & Manns, 2020). These immigrants tended to settle in large urban centres in Australia, like Sydney and Melbourne, substantially changing the social and ethnic landscape. For example, in Sydney, the 10 largest overseas-born groups in 1981 did not include a single Asian-origin group, but by 2021, Chinese, Vietnamese, Filipino, Malaysian, and Sri Lankan were all in the 10 largest origin groups with the increasing immigration from these Asian countries since 1981 (Australian Bureau of Statistics, 1981, 2021).

2.4.2 Chinese in Australia

As the focus in this thesis is on Chinese Australians, I will consider immigration from China more closely. The immigration history of the Chinese in Australia dates back to the 1840s. Between the 1840s and 1870s, the gold rush years, about 100,000 Chinese entered Australia, many of whom were from Guangdong and Fujian, China (Jupp, 2001, p. 197). In 1901, the proclamation of the Immigration Restriction Act (which later became known as the White Australia Policy) caused a continuing decline of Chinese immigration up until the 1970s, when Australia revoked the White Australia Policy. During the 1980s, the Australian government introduced the Business Migration program, which attracted a large number of immigrants from Hong Kong (Jupp, 2001, p. 218). At that time, those Hong Kong immigrants were anxious about the return of Hong Kong to mainland China as the social and political effects of it were unpredictable. They were predominantly skilled workers or businessmen when migrating to Australia, and they retained business links with Hong Kong. Also, because many of their family members were still living in Hong Kong, they frequently “commuted between their new and old countries” (Clyne, 2003, p. 14). Later in the 1990s, students from mainland China became the major source of Chinese immigrants to Australia due to the political unrest resulting from suppression of student demonstrations in 1989 (the Tiananmen Square revolt) (Australia accepted about 20,000 Chinese students through temporary protection visas, Jupp (2007, p. 178)), and the number of this group had been further increased by 32,000 between 1991 and 1996 because of family reunion (Clyne, 2003, p. 14; Jupp, 2007, p. 187). Today, China has become the second most common non-English speaking country of origin for Australians, following India, due in part to the large numbers of mainland Chinese students studying in Australia.

The most recent Australian census shows that Mandarin has 685,274 speakers and Cantonese has 295,281 speakers, ranking first and fourth among languages spoken at home other than English. They constitute 2.7% and 1.2% of the total population, respectively. Among the one quarter of the population who speak a language other than English at home, Mandarin accounts for 29.8%, and Cantonese represents 12.9% of all community language speakers (Australian Bureau of Statistics, 2021). The history of these languages concords with the immigration history just described, as Cantonese is the main language spoken in Hong Kong, and Mandarin in mainland China. As seen in Figure 1, from 1991 to 2021, there has been a dramatic increase in the population of Mandarin speakers that has grown by over 10 times (from around 53,000 to nearly 700,000), while the increase of the Cantonese-background population has been steadier and less marked, nevertheless nearly doubling in numbers over this period.

Figure 1 Change of the population of Mandarin- and Cantonese-background Australians.



This means that, although Mandarin-background Australians represent a larger community today, the Australian Cantonese-background community has a longer immigration history, and therefore a larger population of adult second generation immigrants who grew up speaking Australian English. For this reason, in the Sydney Speaks project, the focus has been on Cantonese-background Australians (and not the larger population of Mandarin-background Australians). Furthermore, the difference in immigration timelines between the Cantonese-background Chinese and the Mandarin-background Chinese in Australia aligns with the situations of the Chinese community in North America, so by looking at the Cantonese-

background Chinese in Sydney, this work can more readily be compared with the Cantonese-background Chinese in New York City, San Francisco and Toronto (Becker, 2010; Hoffman & Walker, 2010; Wong, 2007; Wong & Hall-Lew, 2014).

These different immigration timelines have a social impact, as the longer immigration history of the Cantonese-background Australian group means that they have had a longer time to integrate into Australian society than the newer Mandarin-background Australians. They also differ in their socioeconomic status as the Cantonese-background Australians came from a population that was made up of wealthy business immigrants (Clyne, 2003, p. 15). The Business Migration Program under which many Cantonese speakers came to Australia required a high level of English proficiency, and these immigrants continue to work in professional occupations (Clyne, 2003, p. 14). Also, Hong Kong has a long history with English since the British rule in 1842, leading to the development of its own variety over time (Chan, 2002, p. 273). For the Mandarin-background population, on the other hand, more limited English ability has posed difficulties for them to access similar socioeconomic status to that of the Cantonese-background group (Zhang, 2015, p. 2) (see Jupp, 2001, p. 221 for more details).

Another notable social characteristic of the Cantonese-background Australian group in terms of socioeconomic status is their high level of education in Australia. Specifically, among Hong Kong-born Australians residing in Greater Sydney, 47.7% reported having completed “Bachelor Degree level and above” as their highest level of educational attainment, nearly twice that of the Australian born Sydneysiders (24.9%). Regarding employment, 40.5% of Hong Kong-born Sydneysiders held white-collar professional positions, whereas 25.6% of the total Australian population in Greater Sydney held similar roles (Australian Bureau of Statistics, 2016). For the Mandarin-background Chinese population born in China (excluding special administrative regions (SARs) and Taiwan) residing in Greater Sydney, 42.7% reported achieving a “Bachelor Degree level and above” as their highest educational attainment. Moreover, 29.2% of individuals born in China (excluding SARs and Taiwan) were employed in white-collar professional roles, which was comparatively lower than the proportion of Hong Kong-born Australians.

And finally, we also see generally higher socioeconomic status of the Cantonese-background Australian group in the regions in which they live. Markus, Jupp and McDonald (2009, p. 79) found that compared with European immigration communities, “Chinese Australians seem to be attracted to the quintessential suburban middle-class areas”. Specifically, our target ethnic

group, the Cantonese-background Chinese Australians, is primarily concentrated in the north of Sydney, in particular suburbs such as Ryde, Willoughby, Hornsby, Ku-ring-gai and Baulkham Hills (Markus, Jupp, & McDonald, 2009, p. 79).

In summary, Cantonese-background Chinese Australians in Sydney tend to be concentrated in wealthier suburbs in the north of the city, have high levels of education and work in white-collar professions. They can therefore be generally classified as a middle class community in Australia, as observed in Markus, Jupp and McDonald (2009, p. 86). Thus, we might predict that their speech patterning would be distinct from that of other European ethnic and Anglo communities who show more variability in social standing in Australia.

2.5 Prior treatments of ethnicity

In sociolinguistic research, ethnicity has been studied mainly in two approaches. In early sociolinguistic studies, it was defined according to the ethnic background of speakers and was regarded as a categorical variable that was perceived as fixed and stable (e.g., Labov, 1966; Labov, 1972b; Wolfram, 1974). Such an essentialist approach may "oversimplify the multivalent and multimodal nature of identities as well as the nuanced ways in which these identities are indexed and negotiated linguistically" (Wong & Hall-Lew, 2014, p. 27). More recently, the constructivist approach has been developed and applied, which regards ethnicity as existing along a continuum with members of the same ethnic community orienting to their ethnicity to different degrees (e.g., Becker, 2014; Benor, 2010; Hoffman & Walker, 2010; Nagy, Chociej, & Hoffman, 2014; Newlin-Łukowicz, 2016; Staicov, 2020).

Benor (2010, p. 159) posited that there is a major contradiction in the study of language and ethnicity – "how can we discuss distinctively ethnic ways of speaking and still account for the variation and fluidity that characterize them?" She argued that "ethnolinguistic repertoire", "a fluid set of linguistic resources that members of an ethnic group may use variably as they index their ethnic identities", should be taken into account when investigating the effect of ethnicity on language use. In quantitative sociolinguistic studies of language and ethnicity, this concept has been interpreted as ethnic orientation, defined as "speakers' sociolinguistic practices and attitudes" (Nagy, Chociej, & Hoffman, 2014, p. 9) (see also Hoffman & Walker, 2010; Sharma, 2011).

Ethnic orientation has been operationalised in a number of different ways, typically drawing on information collected via questionnaires. For example, in Hoffman and Walker's work on

ethnolectal features in Canadian English, they administered a questionnaire orally as part of the interview to quantify speakers' perceived degree of ethnic orientation (Hoffman & Walker, 2010, p. 46). Their questionnaire comprised 8 categories relevant to aspects of ethnicity and ethnic identity, namely, "ethnic identification; language; language choice; cultural heritage; ethnic orientation and language practices of the informant's parents and partner; attitudes about the importance of ethnic culture; and experience and perceptions of discrimination", which were specified in 35 questions. Each response was scored on a three-point scale, and the final score for each speaker was averaged across questions to facilitate cross-group comparisons. Since not all questions were independent of each other, a Principal Component Analysis (PCA) was performed which reduced the questions to 4 independent factors, including social network (the most important component which accounted for 35% of the variance), speaker's grandparents, experiences of discrimination in work, and experiences of discrimination in housing (Hoffman & Walker, 2010, p. 47). This same approach has been replicated in the study of variation and change among immigrant groups in Sweden (Boyd, Hoffman, & Walker, 2015, p. 298; Gross, Boyd, Leinonen, & Walker, 2016), to heritage language variation and change in Toronto (Nagy, 2011; Nagy, Chociej, & Hoffman, 2014); and in Australia (Alimoradian, 2014; Bharadwaj, 2014).

Linguists have also drawn on a survey method developed by social psychologists, the Multigroup Ethnic Identity Measure-Revised questionnaire (Meim-R) (Phinney & Ong, 2007), based on ratings to statements about, for example, time spent in finding out more about a speaker's ethnic group, such as its history, traditions, and customs; the degree of a sense of belonging to their ethnic group; the significance of ethnic group membership; activities that helped with the understanding of their ethnic background; conversations about and attachment towards their ethnic group (Phinney & Ong, 2007, p. 276). Participants were required to rate these statements on a five-point Likert scale, ranging from 5 for "strongly agree" to 1 for "strongly disagree". Clothier (2019) used this scale to inform his adaptation of the Hoffman and Walker (2010) survey, and Staicov (2020) incorporated the Meim-R into her sociolinguistic questionnaire.

Staicov (2020) also included a membership index calculated from a content analysis of themes identified in the interviews, on "experiences of living in Chinatown, attitudes and identification with Chinatown, language practices, and language attitudes" (p. 73). These themes were scored on a 5-point scale ranging from 1 (least Chinese ethnicity) to 5 (most Chinese ethnicity). To address issues of subjectivity and reliability, three annotators coded three sets of themes derived from the interviews, "the overall mean across all themes" was calculated to compose

an ethnic identity index (Staicov, 2020, p. 73). PCA was used to reduce the number of questions, and three clusters were identified according to the highest mean values, namely ties to Chinatown and attitudes to the heritage language, affiliation to the heritage community and cultural background, transnational ties and investment in language maintenance (Staicov, 2020, p. 74).

Other methods of assessing ethnic orientation have also been developed. In her work on Polish New Yorkers, Newlin-Łukowicz (2016, p. 112) administered a three-part "Polish-involvement survey" which included questions about speakers' Polish lifestyle, their involvement in the New York City Polish community and their transnational ties. She employed hierarchical cluster analysis (HCA) to group speakers based on the overall similarity of their responses in the survey (p. 103) and then used those groupings to test for ethnic effects.

In Multicultural London English, social network has been appealed to as key to understanding the patterning of ethnic minorities. Cheshire, Fox, Kerswill and Torgersen (2008, p. 6) determined speakers' social network scores from demographic questions which asked the participants to list the number of their close friends and their ethnicity, and then scored them on a 5-point scale according to the ethnic distribution of the social network. They found that diversity of social network plays a role in all linguistic innovations, and that Anglos living in the multilingual working class neighbourhoods who were part of these networks also picked up multiethnolectal features, giving rise to what they term Multicultural London English (Cheshire, Kerswill, Fox, & Torgersen, 2011, p. 152; see also Fox, 2015).

2.6 Linguistic studies of ethnic variation

2.6.1 Ethnic variation in Australia

The foundational work on the notion of ethnolects in Australia was done by Clyne and colleagues (e.g., Clyne, 2000; Clyne, Eisikovits, & Tollfree, 2001, 2002) who described a range of features in the English of Greek, Yiddish and German Australians. This early work focused on identifying specific linguistic structures of ethnic variation, and drawing hypotheses about how that might be associated with ethnic identity.

As reviewed in Section 2.2, one of the first large-scale quantitative studies of ethnic variation in Australia was conducted by Horvath (1985) through the Sydney Social Dialect Survey. She found that in general the children of first generation immigrants patterned with their Anglo

peers, but were ahead in some ongoing changes. Specifically, for the socio-stylistic variation along the Broad / General / Cultivated continuum (cf., Mitchell & Delbridge, 1965), the Italian and Greek Australians were observed to be moving away from both Broad speech, associated with the working class, and Cultivated speech, associated with the middle class and British Received Pronunciation (Horvath, 1985, p. 94). In comparison, the Anglo Australians showed greater concentration in Broad vowel realisations. The Italian Australians in particular were reported to adopt a more General sociolect (Horvath, 1991, p. 315). She interpreted General vowel realisations to be "the safest ground for 'sounding' Australian" for the second generation ethnic minorities (Horvath, 1985, p. 176). Drawing from the same corpus, Guy, Horvath, Vonwiller et al. (1986) conducted a study exploring the high rising tone in Australian English, specifically observing the use of a high rising terminal contour in declarative clauses rather than a falling one. Their research revealed the highest rate of usage within the working class. Relatively similar rates were observed among Anglo, Italian, and Greek Australians, indicating minimal ethnic differentiation (p. 39). However, an interaction between class and ethnicity was found, particularly in the upper working class, displaying a notable difference between Greek and Italian groups, which was not evident in the lower working class or middle class (p. 40). Furthermore, the rejection of the high rising tone as an innovation predominantly stemmed from lower working class male Italians and Greeks. These findings imply an intersection between social class and ethnicity, highlighting that "the social status of an Australian is not entirely independent of their ethnic origin" (p. 41).

Since that time, there have been more quantitative studies of ethnolects in Australia which have more systematically examined the English of ethnic minorities with a focus on Italian, Greek and Lebanese Australians. Kiesling (2001, p. 244) investigated the English of 12 young second generation (aged 14–29) Australians of Anglo, Greek, Italian, Lebanese and Vietnamese background, all of working class and living in Sydney. His analyses of sociolinguistic interview data indicated that Greek women were leading in the raising and backing of GOAT and PRICE (p. 252). Kiesling (2005, p. 2) examined 21 second generation Australians of Anglo, Italian, Greek and Lebanese backgrounds and found that compared with the Anglo Australians, the Greek and Lebanese Australians used a more backed and lengthened word-final *-er*, especially in the prosodic environment of high rising tone. Further analysis suggested that the Greek Australians were leading a change to a more backed variant of word-final *-er* (p. 33).

The English of Lebanese Australians has been examined in more recent work. Cox and Palethorpe (2005) investigated vocalic and prosodic patterning of English sentences read by

5 male second generation Lebanese Australians who were in their early twenties and found that it was largely parallel to that of “Standard Australian English”, but some specific final voicing and vowel duration effects found in this variety were argued to reflect influence from Arabic (Cox & Palethorpe, 2005, p. 47). Clothier and colleagues examined the speech of Lebanese Australians, based on the AusTalk wordlist task comprising 30 second generation speakers aged between 18 and 30 (Clothier, 2019; Clothier, 2020; Clothier, Fletcher, & Loakes, 2018; Clothier & Loakes, 2018). These studies applied acoustic analysis to VOT and /l/ realisation (clearness and darkness) in the English of Lebanese Australians, and found “no evidence of transfer” from Arabic (Clothier, 2019, p. 1891; Clothier & Loakes, 2018, p. 13). Instead, the variation of these structures was conditioned by social factors, such as gender, ethnic orientation (EO) and social network ties. Specifically, Clothier, Fletcher and Loakes (2018) tested phonological patterning against EO and gender in the English of Lebanese Australians, and found that for the duration of voiceless stops /p, t, k/, the effect of EO was opposite on women and men in that women with higher EO used longer VOT while men with higher EO, especially those with more Lebanese dominant social network, used shorter VOT. For the variation of voiced stops /b, d, g/, EO did not show a significant effect, but there was a gender effect: the Lebanese Australian men produced significantly more pre-voiced tokens than both the Lebanese women and the Anglos (Clothier, 2020, p. 163). Similarly, Lebanese Australians’ use of /l/ revealed that word-initially, both women and men with a more Lebanese dominant social network had a clearer /l/, but word-finally, this effect was not significant for men but for women it was the reverse in that women with a more Lebanese dominant social network used darker /l/ (Clothier, 2019, p. 1891), indicating that Lebanese women were using this contrast between the two prosodic contexts to perform “a very particular Lebanese Australian identity” (Clothier, 2020, p. 164). These studies argued that “men and women use linguistic means to perform their ethnic identities differently” (Clothier, 2020, p. 164), so the intersection between gender and EO should be carefully considered when investigating ethnic variation (see also Bucholtz, 1995, p. 369).

Ethnic variation has also been evidenced in style shifting in vowel production by Russian Australians. Gnevsheva (2020) compared GOOSE and TRAP vowels in the English of 21 first and second generation Russian Australians and Anglo Australians in Melbourne across conversation, interview and reading tasks. This study found that, as expected, first generation Russians produced more Russian-like vowels, a backer GOOSE and a higher TRAP, compared with both Anglo and second-generation Russian Australians. The differentiation between first and second generation Russian Australians indicates a lack of language transfer features in

the English of the second generation speakers (p. 874). For the second generation speakers, their pronunciation of the GOOSE vowel showed no differences from the Anglos in the conversation task, but interestingly they did produce a more Russian-like pronunciation in the interview and the reading tasks; for TRAP, they showed no significant differences from the Anglos in any of the styles (p. 874). Gnevsheva argued that ethnolectal features in the speech of the second-generation ethnic minorities may be derived from the substrate, but used for achieving certain sociolinguistic purposes, like ethnic identity construction and style-shifting. Thus, she proposes that these features may be "reallocated … for their own meaning-making purposes" and then represented differently from first-generation speakers and the dominant Anglo majority (Gnevsheva, 2020, p. 877).

The ethnic variation of interest in these studies was primarily at the phonetic or phonological levels, though ethnolects have been argued to be "phonologically, lexically, morphosyntactically, and/or prosodically marked" (Clyne, Eisikovits, & Tollfree, 2002, p. 133). There are other studies that have looked at ethnic variation in Australian English beyond sociophonetics. Alimoradian (2014) examined the self-reported use of Australian vocative *mate* by 101 Australians of first generation immigrants (individuals who had resided in Australia for a minimum of six years and were aged over 12 at the time of their migration) (n = 34), second generation immigrants (individuals were either born in Australia to first generation parents or had migrated to the country before the age of six, completing their entire education in Australia) (n = 41) and new arrivals (individuals had resided in Australia for a maximum of four years) (n = 26) of diverse ethnic heritages, with the majority from Iranian (n = 38), Chinese (n = 29) and European (n = 26) backgrounds (pp. 604-605). He found that a significantly higher proportion of second generation Australians reported using *mate* than first generation Australians (68% vs. 38%), while new arrivals (50%) fell in between both groups and were not significantly different from either group (p. 607). He also found a correlation with EO, in that a higher proportion of participants with low EO (of whom 81% were second generation) reported using *mate* and in more innovative contexts, namely with the address categories not limited to Anglo Australians and men, but also women and members of the same ethnic group (pp. 608-610). A gender effect in the reported use was found, in that men claimed to use significantly more *mate* than women (p. 610). Importantly, the interaction between EO and gender was observed such that low EO women claimed to use *mate* with a wider range of interlocutors than men, suggesting they were leading "a more widespread and innovative use of the vocative" (p. 614). In sum, this study found that second generation immigrants and low EO women claimed to use *mate* more innovatively.

Another variable that has been examined is epistemic/evidential complement-taking predicate phrases (E/E CTPs) (e.g., *I think, I would say, I guess*). Bharadwaj (2014) examined the use of such phrases (in particular, *I think* vs. *I would say*) in the English of 30 first-generation Indian Australians, comparing the observed patterning with that reported for Anglo Australians in the International Corpus of English–Australia (cf., Rodriguez Louro & Harris, 2013). Bharadwaj (2014) found that *I think* was the most frequent variant of E/E CTPs in the English of first generation Indian Australians, parallel to the pattern in the English of Anglo Australians. She did observe a role for EO, in that the Indian participants with low EO favoured the form most used by Anglo Australians, *I think*, whilst those with high EO favoured *I would say*. *I think* was favoured by younger Indian Australians, and by women, suggesting that female Indian Australians were ahead in the change to *I think* in this community, leading in a shift to a more mainstream interactional style of Australian English set by the Anglo Australians (p. 46).

As can be seen above, these studies of ethnicity in Australia do find some differences in the patterning between ethnic minorities and the Anglo majorities at both the phonological and the grammatical levels. In some cases, this has been tied to ethnic identity, not only in comparisons across generations of immigrants (with the first generation tending to have higher EO), but also among second generation migrants, that is, Australian-born children of immigrants. A role of social network and gender has also been observed, in some cases, in interaction with EO. Furthermore, most studies of ethnic variation in Australia have focused on the speech of European immigrants, such as Italians, Greeks and Lebanese, as long-term immigrant communities. Nevertheless, these studies have certain limitations. Firstly, most of them involved small sample sizes. For instance, Kiesling's studies included fewer than 30 speakers. Secondly, these analyses primarily relied on task-based speech data rather than spontaneous speech data, as seen in the research conducted by Clothier and colleagues on Lebanese Australians. Thirdly, apart from the earlier work by Horvath and colleagues, and Kiesling, more recent studies did not look at the effect of social class. Lastly, there has been relatively limited research conducted on the English spoken by newer and rapidly growing groups, such as Chinese Australians.

However, as reviewed above in Section 2.2, the work conducted by the Sydney Speaks team has notably addressed these gaps (e.g, Grama, Travis, & Gonzalez, 2020, 2021; Purser, Grama, & Travis, 2020; Qiao & Travis, 2022; Sheard, 2022; Travis, Grama, & Purser, 2023; Travis & Torres Cacoullos, 2023). Their research conducted large-scale quantitative analyses of variation and change in Australian English based on spontaneous speech data collected from established groups like Anglos, Italians, and Greeks, as well as the newer Chinese

community. These studies examined various phonetic and grammatical variables, such as monophthongs, diphthongs, (ing), word-final *-er*, *the*+VOWEL, and modal verbs of obligation, considering how age, gender, ethnicity, and social class intersected. The findings highlighted an intersection between social class and ethnicity. It was revealed that patterns of ethnic variation were elucidated when considering the class affiliations of ethnic groups. This emphasises the significance of examining the interaction between these factors, reaffirming the pioneering work initiated around forty years ago by Horvath and colleagues (e.g., Guy, Horvath, Vonwiller et al., 1986; Horvath, 1985). In furthering this line of research, I analyse new variables focusing specifically on the Chinese community here.

2.6.2 Chinese ethnic variation

Ethnic variation among Chinese as an immigrant community has been most widely studied in North America (e.g., Becker, 2010; Becker, 2014; Becker & Wong, 2010; Hoffman, 2010; Hoffman & Walker, 2010; Wong, 2007; Wong & Hall-Lew, 2014). In Canada, Hoffman and Walker (2010) examined the English of first and second generation Anglo, Italian and Cantonese-background Chinese Canadians, to test for ethnolectal features. They studied two types of variables, t/d deletion, a stable variable, and the Canadian Vowel Shift (CVS), a change in progress. Though rates of use were not identical across the ethnic groups, the conditioning was similar, indicating that the same linguistic system is shared across the community. However, in some cases, differences in overall rates of use for CVS correlated with EO, such that a higher EO score correlated with lower rates of participation in the CVS for the Chinese community. This leads Hoffman and Walker to propose that "though all speakers share the same linguistic system, at least some of them may be using overall rates of use to construct and express ethnic identities" (p. 58).

In the United States, work has been done on Chinese Americans of Cantonese-speaking background in New York City and in San Francisco, where the largest populations are located. Wong (2007) found that Chinese Americans partly adopted the features of New York City English (NYCE) – they maintained a low back vowel distinction between LOT and THOUGHT as other New Yorkers did, but they did not acquire the local split short-a system (Becker & Wong, 2010, p. 16). Along similar lines to Hoffman and Walker (2010), speakers with Chinese-dominant social networks and lifestyle were less likely to adopt the NYCE vowel features (see also Wong, 2015, p. 100). Comparisons across New York City and San Francisco revealed that Chinese Americans participate in the respective regional variation and change, including for the conditioning (Wong & Hall-Lew, 2014). Specifically, Wong (2015, p. 252) found that the

pattern of GOOSE-fronting among second generation Chinese Americans in New York City coincided with the pattern characteristic of local NYCE – they "produced somewhat fronted TOO while HOOP remained non-fronted". This variation was not socially stratified, but the presence of stylistic stratification was evidenced in that both TOO and HOOP were more fronted in reading than in interviews, indicating "likely indexical meanings" in the variation of GOOSE-fronting (Wong, 2015, p. 253).

While these studies focused on the ethnic variation of second generation Chinese Americans at the sociophonetic level, Staicov (2020) looked beyond sociophonetics, examining the patterning of a set of morphosyntactic features, namely article use, past tense marking and number marking. These features were selected because there are typological differences between English and Cantonese, which does not have tense or number morphology, and nor does it use articles, and they are recognised features in varieties of English as a Second Language (p. 88). Her sample was made up of first (n = 37) and second generation (n = 36) Chinese Americans of Cantonese-speaking background, all tertiary educated, and therefore from "a largely middle-class background" (Staicov, 2020, p. 115). The second generation speakers were further divided into older and younger age groups. The generational differences were compared between the first generation (that is, second language speakers of English) and the younger second generation speakers, and within the second generation speakers, older versus younger speakers. For variable number marking and variable article use, she found no significant effect for gender, generation, interlocutor, membership (national vs. transnational) and ethnic identity (Staicov, 2020, pp. 101-104). However, there was interesting social conditioning in the variation of past tense marking, that is, the use of the past tense vs. non past tense forms (e.g., simple present) (e.g., *sing—sang—sung*) for past temporal reference (Staicov, 2020, p. 90). Here, a generation effect was observed such that in comparison with the first generation speakers, the younger second generation speakers marginally favoured the use of the past tense forms (e.g., *sang vs. sing*). Interestingly, both age groups exhibited an impact of ethnic identity, and even among the younger second generation speakers, a stronger sense of ethnic identity correlated with greater use of non-past tense forms in past temporal reference contexts. Furthermore, for both groups, the interaction between gender and ethnic identity was significant, in that men with a stronger sense of ethnic identity used more non-past tense forms (Staicov, 2020, p. 98). When comparing younger vs. older second generation speakers, she found no effect for age, nor for ethnic identity index, but gender, and membership were all significant predictors such that both men and speakers with closer transnational ties favoured the use of the past tense (over non-

past tense forms) and talking to an out-group interlocutor increased the likelihood of using non-standard past tenses (Staicov, 2020, p. 99).

Overall, this study found that second generation Chinese Americans made greater use of mainstream Anglo features than the first generation, supporting the notion that language transfer is not retained across the generations (cf., Hoffman & Walker, 2010). Furthermore, the impact of gender varied for the different variables – men used significantly less of the mainstream Anglo form for the past tense, and marginally so for the indefinite article, which Staicov (2020, p. 112) interpreted as an indication that past tense and indefinite article use were "associated with covert prestige for Chinese American men". As for the effect of ethnic identity, "no clear picture emerged" as it only showed a significant main effect for the past tense marking; also, the significant interaction effect between ethnic identity index and gender for this variable showed that the use of the non-past tense forms was more pronounced in men with higher ethnic identity (Staicov, 2020, p. 115).

In Australia, as described in Sections 2.2 and 2.3, work on sound change from the Sydney Speaks project (Travis, 2014-2022) has found that Chinese Australians tend to orient to middle class norms (Grama, Travis, & Gonzalez, 2020, 2021). Furthermore, this holds also for Chinese Australian men, such that the gender differences evidenced in the Anglo Australians and the Italian Australians are not replicated (Grama, Travis, & Gonzalez, 2020, p. 362). For variation beyond the sociophonetic level, Lee (2020) investigated the quotative system in the English of Anglo, Greek, Italian and Chinese Australians over time. As has been observed across the globe for English, *be like* has become the most popular form among younger speakers today (cf., Labov, 2018). In terms of ethnic variation, she found that young Italian Australians were those using *be like* the most (Lee, 2020, p. 71); the gender effect for young Chinese Australians was reversed in that while *be like* was favoured by women over men for Anglo and Italian Australians, it was marginally favoured by men over women for the Chinese (Lee, 2020, p. 80), consistent with the high socioeconomic status of the Chinese in Australia, and with the gender findings for vowel realisations (cf., Grama, Travis, & Gonzalez, 2021).

In summary, the work examining English spoken by second generation Chinese immigrants in the United States, Canada and Australia has shown that they are participating in regional variation and change generally at both the phonetic and grammatical levels; there is little evidence of a qualitative difference in features used, though there is some evidence of a difference in rates of use (Hoffman & Walker, 2010, p. 53), which may correlate with EO (Hoffman & Walker, 2010, p. 47; Wong, 2007, p. 227). Interaction of EO with other social

features has also been observed, such as with class and gender (Clothier, 2019; Clothier, 2020; Staicov, 2020).

To advance this field of research, I explore linguistic variables at both sociophonetic and morphosyntactic levels within a single study – a rarity in existing literature (cf., Cheshire, Kerswill, Fox, & Torgersen, 2011; Fox, 2015; Sharma, 2021a). Addressing a notable gap, I focus on the intersection of ethnicity with other social factors such as gender and class, an area that has received insufficient attention in prior research. This study delves into different class and gender groups within the Chinese Australian community, contextualising their linguistic patterns through comparison with various age, gender, and class groups among Anglo Australians. Moreover, this study investigates nuanced measures of ethnic background, including factors like ethnic orientation and social network, recognised as important in the investigation of ethnic variation. Additionally, while substrate transfer from heritage languages is proposed as one of the mechanisms of ethnic variation, prior research lacks direct testing in the speech of ethnic minorities (cf., Cheshire, Kerswill, Fox, & Torgersen, 2011). In this study, I directly compare the rates of usage of variables and their linguistic conditioning between ICE-HK and the English of Chinese Australians, aiming to address the question regarding the effects of substrate transfer in ethnic variation, thereby contributing to the discourse. In summary, this thesis aims to contribute to discussions regarding the role of ethnic minorities in language variation and change. It seeks to explore whether differences are related to the degree to which ethnic minorities are connected with their ethnic heritage and whether other social factors also hold significance in this context.

Chapter 3 Methodology

3.1 A Variationist perspective

This thesis is theoretically and methodologically informed by Variationist Sociolinguistics. The central idea of this approach is that language possesses “orderly heterogeneity” (Weinreich, Labov, & Herzog, 1968, p. 100). That is, the ubiquitous variability in language use (e.g., *will* vs. *be going to*) is probabilistically constrained by both linguistic (e.g., sentence type, proximity, grammatical person of subject) and social (e.g., age, gender) factors (Bayley, 2007, p. 134). Thus, variationist sociolinguists do not search for “a single overarching explanation” for the variability of frequency of use (Bayley, 2007, p. 135), but instead are more interested in the linguistic and social conditioning of such variability – the favouring of particular variants by certain linguistic and social factors (see Tagliamonte, 2013 for an overview). Multivariate statistical modelling is used to identify the systematicity of collocational patterns across different factors simultaneously (e.g., phonological, lexical, semantic, syntactic) (e.g., Tagliamonte, 2006).

Furthermore, this approach argues that “an understanding of language requires an understanding of variable as well as categorical processes” (Bayley, 2013, p. 9). To understand the variable processes, the central task is to identify linguistic variables that can be “quantified on a linear scale” (Labov, 1972b, p. 49) and circumscribe the variable envelope where there are “alternative ways of saying the same thing” within which meaningful comparisons can be conducted (Labov, 1994, p. 550).

3.2 Sydney Speaks

This study is conducted as part of the Sydney Speaks project (Travis, 2014-2022), a large-scale project centred in Sydney, as one of the largest and the most diverse cities in Australia, which interrogates language variation and change over time and across ethnic groups. The speech data of the Sydney Speaks corpus come from sociolinguistic interviews with a total of 260 speakers (approximately 130 hours or 1.25 million words of speech) recorded in two time periods (1970s-1980s vs. 2010s-2020s). All participants have spent all or almost all of their lives in Sydney and are native speakers of Australian English.

In the Sydney Speaks corpus, four ethnic groups are represented: Anglo, Italian, Greek and Chinese Australians. The Anglo Australians are all of Anglo-Celtic background, and their

parents and grandparents are from Australia. All ethnic minorities, including Italian, Greek and Chinese Australians, were either born in Sydney or arrived before the age of six.

Socioeconomic class has not been widely examined in studies on Australian English and there are no universally accepted metrics for its classification. In the Sydney Speaks project, socioeconomic class was evaluated based on four widely used social variables in sociolinguistics: occupation, level of education, high school type, and suburb, which was treated as a composite. This classification resulted in three distinct social class groups – Middle Class (the highest), Lower Middle Class, and Working Class (the lowest) (Grama, Travis, & Gonzalez, 2020, p. 351). The sample of second generation Cantonese-background Chinese Australians does not cover the full social spectrum, and falls into two groups that closely correspond to the Middle Class and Lower Middle Class in the Anglo groups. As outlined in Section 2.4, the Cantonese-background Chinese community in Australia predominantly holds high socioeconomic status, which accounts for the absence of Working Class Chinese participants in the sample. This group often attends selective or private schools, receives high level of education, and is employed in high-status occupations in Australia (cf., Grama, Travis, & Gonzalez, 2020, 2021; Purser, Grama, & Travis, 2020; Travis, Grama, & Purser, 2023). Similar to what Li (1982) found in the United States regarding the Chinese community, this reflects the overall high socioeconomic status within the Chinese community in Australia, which is pertinent to the language patterns observed in the English of Chinese Australians.

The data from the 2010s were collected through sociolinguistic interviews. To minimize the "observer's paradox" (Labov, 1972a, p. 209), the interviews were all conducted by community members who recorded their friends, extended family members, and friends of friends. The interviewers were instructed to facilitate natural speech as much as possible, seeking in particular narratives of personal experience. A set of topics of interest was also provided, to use as a guide where relevant (e.g., about life growing up, family and friends, language use, attitudes to diversity in Australia, etc.), though the degree to which the interviewers drew on these topics varied a lot across the interviews (see a list of interview topics in Appendix 1). The interviews lasted an average of 90 minutes. Initially, we transcribed 60 minutes of each interview orthographically and from this, selected approximately 30 minutes for prosodic transcription and forced alignment. Typically, this process began between 15 and 30 minutes into the recording. Prosodic transcription was undertaken using ELAN (Brugman & Russel, 2004), and segmenting the data into Intonation Units, defined as "a stretch of speech uttered under a single, coherent intonation contour" (Du Bois, Schuetze-Coburn, Cumming, & Paolino, 1993, p. 47) (refer to the Appendix 3 for the transcription conventions). Subsequently, these

transcriptions were uploaded into the Language, Brain & Behaviour Corpus Analysis Tool (LaBB-CAT) for forced aligning and corpus management (Fromont & Hay, 2012).

From the total of 260 participants in the Sydney Speaks corpus, my thesis focuses on the second-generation Chinese Australians with a Cantonese-speaking background (whose parents are primarily from Hong Kong), their Anglo peers and an older generation of Anglos recorded in the 2010s. Therefore, the sample for this thesis comprises 75 speakers and approximately 350,000 words of spontaneous speech from these groups.

3.2.1 Demographic information of the participants

Table 1 presents the demographic breakdown of the participants from the Sydney Speaks corpus included in this thesis. Among the Anglo Australians, two distinct age groups are represented: Adults (born around the 1960s; aged 42-61 years old at the time of data collection) and Young Adults (born around the 1990s; aged 18-31 years old), using operational terms defined for this project (Travis, Grama, & Purser, 2023, p. 441). This facilitates apparent time comparisons to track the change of the investigated variables. Additionally, an approximately equal number of women and men are included in both age groups, based on self-reported gender identification in the post-interview questionnaire. Regarding social class, three different groups have been categorised for the Anglo Australians, as detailed earlier. Among the Chinese Australians, only the Young Adults age group is included, given that they represent a more recent migrant group compared to the Anglo Australians and encompass more native speakers of Australian English within the 18 to 31 age range. In this community, an equal number of women and men have been included. In terms of social class, only the middle class and lower middle class of Chinese Australians are represented. As shown above in Section 2.4, the absence of working class second generation Cantonese-background Chinese participants in the sample reflects their high socioeconomic status in Australia.

Table 1 Demographic breakdown of participants from the Sydney Speaks corpus.

Age group	**Anglo Adults**		**Young Adults**			
Average birth decade	1960s		1990s			
Age range (years)	42-61		18-31			
Average age (years)	53		24			
Ethnicity and gender	**Anglo**		**Anglo**		**Chinese**	
	Women	**Men**	**Women**	**Men**	**Women**	**Men**
Middle	4	2	4	5	5	7
Lower Middle	6	7	5	5	6	4
Working	5	3	3	4		
Total speakers	15	12	12	14	11	11

High socioeconomic status in Australia is just one factor that distinguishes Chinese Australians. There are other distinguishing factors characteristic of Chinese Australians, particularly their ethnic background and culture.

3.2.2 Measures of ethnic orientation

Drawing from previous discussions on ethnicity within the literature, the Sydney Speaks team gathered and compiled multiple measures to assess the ethnic background of the Chinese Australians in this sample from both sociolinguistic interviews and demographic questionnaires (see Appendix 2). Here, I look at four measures, including social network, self-reported Cantonese proficiency, density of Cantonese speakers in their neighbourhoods, and ethnic orientation, which will be introduced in the following sections. To begin, let us examine ethnic orientation index, which comprises social network, self-reported Cantonese proficiency, and other related factors as its components.

3.2.2.1 Ethnic Orientation Index

We have seen above that ethnicity is either categorically defined according to speakers' ethnic background or quantitatively measured by questionnaires or content-based analyses. Importantly, in many studies, EO has been found to play a role in conditioning linguistic

variation. EO has been found to relate to social network as speakers of the same or similar ethnic background interact more frequently with one another, providing them with more opportunities of using the community language, adopting the heritage lifestyle and acquiring the heritage culture – all contributes to the strength of EO.

In order to assess Chinese Australians' degree of orientation to their Chinese heritage and culture, an EO index was compiled for Sydney Speaks, inspired by the work of Hoffman and Walker (2010), and taking into account network, along the line of Cheshire, Fox, Kerswill and Torgersen (2008). Unlike these prior studies, however, for the Sydney Speaks project, this index was established primarily by content analysis, that is, by extracting all comments from the sociolinguistic interview that were relevant to ethnic identity, including comments relating specifically to identity and social network, but also language use, participation in cultural activities, and so on (cf., Lee, 2020, pp. 90-92; Travis & Sheard, 2020).

The process for this, as described in Travis and Sheard (2020) was as follows. Comments were initially extracted by one person, and then revised by another, with adjustments made as needed. There was rarely disagreement about the topics extracted and the categories they fit into, with most amendments being in relation to the score to assign. These sub-topics were then grouped into themes, as shown in Table 2.

Table 2 Themes and topics in the interviews.

Theme	Sub-topic
Identity	Self-identification
Social network	Friends, work, study, growing up, partner
Language	Ability to speak, read, write; language used with friends, siblings, parents; parents' English ability
Ties with ethnic heritage	Travel to Hong Kong / mainland China; participation in cultural traditions; language school, other language studies; parents' identity
Future orientation	Importance of Australian kids learning the language; preferences for a future partner; neighbourhood
Relationship to Australian culture	Experiences of discrimination; participation in Australian customs

The scoring was done as follows. All comments relating to the sub-topics were extracted, and each sub-topic was given a score on a scale of 1 to 5, with 5 representing the strongest and 1 the weakest orientation to the ethnic heritage, and 3 an in-between measure. An average of

the scores across all sub-topics making up any one theme was taken to give a score for each theme, and then an average of the scores for the themes was taken for an overall EO score. In this way, though different information is available for each participant, it is possible to obtain overall scores with some degree of comparability. For the 2010s data for Chinese Australians, we obtained scores for an average of 4.7 themes (ranging from 2 to 6).

We do not claim this as an exact science; and we would not want to read too much into small differences (e.g., an average of 4 vs. 5). But overall, they do provide a general picture of the degrees to which participants engage with their ethnic heritage and, alongside information from the demographic questionnaire, can be used to test whether such orientation has any impact on patterns of language use.

As a check on these measures, we conducted correlation tests between scores derived from content analysis of interviews and those from the demographic questionnaire. The results indicate a strong correlation between the scores of heritage language proficiency from both sources ($r = 0.63$, $p < 0.05$). However, the scores pertaining to social network exhibit a much weaker correlation ($r = 0.32$, $p > 0.05$). This discrepancy underscores the distinct types of information they encapsulate regarding social network: the demographic questionnaire emphasises speakers' current close network, whereas the content analysis delves into their past, present, close, and broader network, encompassing not only friends but also work or study connections and the diversity within their school and neighbourhood. This complexity underscores the multifaceted nature of examining social network (Travis & Sheard, 2020).

Table 3 gives an example of the scoring across different topics for two second-generation Chinese Australians, with quite different ethnic orientations. Specifically, on identity, Stuart describes himself an Australian-born Chinese and associates more with an Australian than Chinese background as he feels more aligned with Australian values. Similarly, Cameron identified his friends and himself as "Australians" who speak "perfect English in Australian accent", but when he describes activities on Boxing Day, he uses "white Australians" to differentiate himself from them. Hence, Cameron's identity score exceeds that of Stuart's. For social network, the difference between Stuart and Cameron is prominent in that, though Stuart's partner is a Chinese Australian, his friendship group at school was mostly the "rugby crowd", which had few Asian people. With the same group of Chinese friends, Cameron went to Chinese school from preschool through to Year 11. He has also travelled with his Chinese Australian friends, resulting in a social network predominantly comprised of Chinese Australians. On language, Stuart comments that he does not speak Cantonese well, but he

would like to learn it “for the kids” and he has attended Chinese classes as an adult. Cameron, on the other hand, can speak, read and write Cantonese well and he watches Chinese dramas and news to learn more Cantonese. Thus, the score of Cameron’s heritage language is much higher than Stuart’s. In terms of ties with ethnic heritage, Stuart was not sent to a Chinese school while Cameron started Chinese school at age 4 and he enjoyed learning Chinese and graduated from the program; even though Stuart visited Hong Kong regularly when he was a child now most of his family is in Australia; Cameron goes to Hong Kong “all the time” and has worked there for some time and language was not a problem for him, even in workplaces. Again, Cameron has a higher score than Stuart. In terms of future orientation, Stuart and his wife express a strong commitment to learning Chinese “for the kids”, showing their dedication to passing on the heritage language to their children. However, such intentions were not mentioned in Cameron’s interview. As for information about relationships to Australian culture, this comes up in Stuart’s interview, but not in Cameron’s, so only Stuart receives a score for this – he played rugby at school, so he was “in with all the boys”; he prefers Australian to Hong Kong lifestyle and does not like the focus on results in Asian culture. Overall, averaging across all the sub-topics, Stuart receives an ethnic orientation score of 2.6 which is much lower than Cameron’s at 4.4.

Table 3 Example of content analysis of the interviews.

Theme	Stuart	Score	Cameron	Score
Identity	Describes himself as ABC, associates himself with an Australian than Chinese background – feels more aligned with Australian values	2	Describes his friends and him speak “perfect English in Australian accent”, they are “Australians”, not “Chinese”, but not “white Australians”	3.4
Social Network	Partner Hong Kong Australian, friendship group at school was mostly the “rugby crowd”, which had few Asian people	2.7	Went from preschool to Year 11 at the Chinese school with the same group of friends; mainly Chinese Australians	4.5
Language	Doesn’t speak well, would like to learn “for the kids”; has attended Chinese classes as an adult	1.7	Can speak well, read and write; watches Chinese dramas and news to learn more	5
Ties with ethnic heritage	Was not sent to Chinese school; visited Hong Kong regularly as a child; most of his family in Australia	3	Started Chinese school at age 4; liked it and made a lot of friends there; graduated from the program; goes to Hong Kong “all the time”, has worked there	4.7
Future orientation	Stuart and his wife are committed to learning Chinese "for the kids" indicating a willingness to pass the language onto their children	4		--
Relationship to Australian culture	Played rugby at school, so he was “in with all the boys”'; prefers Australian to Hong Kong lifestyle; doesn't like the focus on results in Asian culture	2		--
Overall score		2.6		4.4

These scores reflect a mixed identity among Chinese Australians, as supported by their interviews. As shown below, it is an excerpt from one such interview with a young Chinese Australian woman describing some of the complexities around her ethnic identity.

Phoebe: *when I go to China,*
I'm [not] --
Brett: *[hm].*
Phoebe: *I don't quite,*
u- um,
fit in perfectly.
in Australia I don't quite fit in perfectly.
even [though I d]o.
Brett: *[yeah].*
Phoebe: *um,*
in the same way,
you kn- --
I have to be Chinese Australian.
[I w-] --
Brett: *[hm].*
Phoebe: *I wouldn't say I'm Chinese.*
I know I'm Australian,
[technica]lly,
Brett: *[hm].*
Phoebe: *because of the citizenshi[2p2].*
Brett: *[2ye2]ah.*
Phoebe: *but if I were to say,*
just,
I'm Australian,
I think,
that,
removes --
like,
that --
I guess like,
doesn't .. identify .. a lot of the --
(1.0) a l- .. big part of my [identity,
Brett: *[yeah.*
yeah].
Phoebe: *a]nd a lot of like,*
my experiences growing u[2p,
Brett: *[2hm2].*
Phoebe: *and2] like,*
my day to day .. life now,
e[ven].
Brett: *[yeah].*

ye[2ah2].
Phoebe: [2s2]o much is defined,
um,
by being Chinese,
you know.

[SydS_CYF_069_Phoebe: 56:39-57:17][2]

One disadvantage of measuring ethnic orientation based on comments that came up in the interview was that not all participants gave the same information, as can been seen in Table 3. To supplement this, information about social network and language use was extracted from a demographic questionnaire conducted at the end of the interview, which will be introduced below.

3.2.2.2 Components of ethnic orientation

The first component of ethnic orientation is social network. To gain information about social network, following the sociolinguistic interview, participants were asked to name around 6 friends and list their ethnicity (cf., Cheshire, Fox, Kerswill, & Torgersen, 2008). This allowed the diversity of each participant's network to be determined and scored. For example, Stuart listed 3 friends of Chinese background and 3 friends of Korean, Scottish and Croatian backgrounds respectively. We considered people of East and Southeast Asian backgrounds to be of a similar ethnic group to the Chinese here, so Stuart was classified as having 4 out of his 6 friends of a similar ethnic background. Scores were converted to a five-point scale; thus, for Stuart, this was 3.3 (4/6*5 = 3.3). Cameron, on the other hand, listed 4 friends of Chinese background, 1 friend of Asian background and 1 Indian friend. We considered Indians to be of a different ethnic group to the Chinese and other Asian groups here, so Cameron had 5 out of his 6 friends of a similar ethnic background; thus, for Cameron, his social network score was 4.2 (5/6*5 = 4.2).

The demographic form also asked about proficiency in the community language. Each participant was asked to rate their speaking ability in Cantonese between 1 and 5, where 1 is

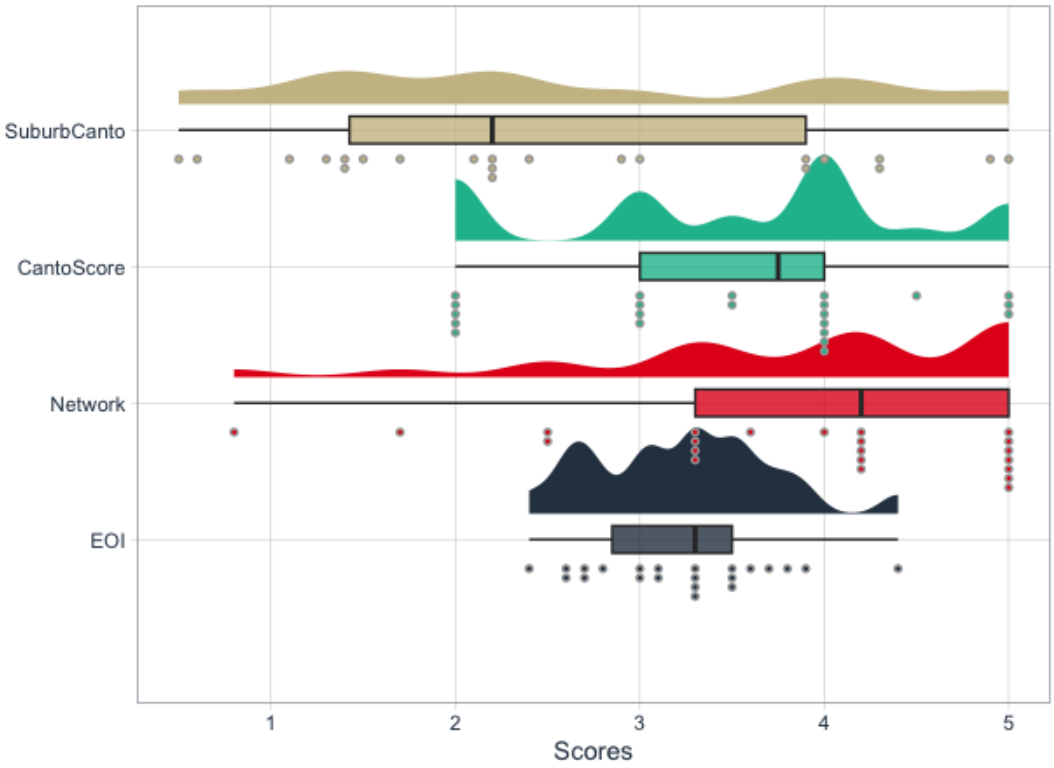
[2] This gives the name of corpus, community, age, gender, recording number, pseudonym and time stamps of the beginning and end of this excerpt.

poor and 5 is native-like. The average score is 3.5 (SD = 1.02) and there is no gender differentiation (p = 0.35) (women: mean = 3.7, SD = 1.06 vs. men: mean = 3.3, SD = 0.98).

Another relevant question included in the demographic form is information about where the speaker has lived, from which a "principal suburb" was identified (where they were living at the time of the interview, or where they have lived the longest). This information was cross-referenced with the 2016 Census information to obtain the proportion of Cantonese-speaking residents in that particular suburb (Australian Bureau of Statistics, 2016). The range for the suburbs of the Chinese participants included in the sample is from just 1.6% of the residents speaking Cantonese (Woodcroft) to 15.2% (Berala). To make this measure comparable with the others which were scored on a 5-point scale, we divided all of the percentages by the highest percentage (that is, by 15.2) and multiplied it by 5. Thus, Charlotte, whose principal suburb is Berala, was given a Cantonese-speaking density score of 5 (15.2/15.2*5); and Bridget, whose principal suburb is Woodcroft was given a score of 0.5 (1.6/15.2*5). Because of this manipulation, this measure ends up with a wider range of scores than the other measures.

In total, I am looking at four measures of ethnic background of the Chinese in this thesis, including ethnic orientation index, social network, self-reported Cantonese proficiency, and Cantonese-speaking density in the suburb. The distributions of these four measures are depicted in Figure 2 using a raincloud plot. The x-axis represents the scaled scores, ranging from 0.5 (lowest) to 5 (highest), for each measure. The y-axis displays the names of the four measures. Each measure is represented by three plots, including a density plot, a boxplot, and a dot plot. In the dot plot, each dot represents a speaker, with a total of 22 Chinese speakers included in the analysis. In the density plot, the skewness, which measures the symmetry of the distribution, differs across the measures. The peaks of the density plot indicate where speakers are concentrated within the interval. In the boxplot, the box represents the interquartile range, which spans from the first quartile (Q1) to the third quartile (Q3). Q1 represents the value below which 25% of the data falls, while Q3 represents the value below which 75% of the data falls. The length of the box and the whiskers represent the spread or dispersion of the dataset. A longer box and whiskers indicate a larger spread of data. The line inside the box represents the median value of the dataset, indicating the middle value when the data is arranged in ascending order.

Figure 2 Raincloud plot depicting the distributions of the measures of ethnic background.



The distributions indicate that, for Cantonese-speaking density in the suburb, two speakers live in suburbs with the lowest score, which is below 1 out of 5, and only one speaker has the highest score at 5. The mean score is 2.6 (SD = 1.4), while the median score is lower at 2.2. Overall, the distribution of this measure is quite balanced.

For Cantonese proficiency, no participant reported a score of 1, indicating that all the participants possess some knowledge of Cantonese. While 5 speakers show the lowest score of Cantonese proficiency at 2, the distribution is skewed towards the higher end. However, only 3 speakers show the highest score of 5. The mean score is 3.5 (SD = 1.0), while the median score is higher at 3.8.

For social network, only one speaker shows the lowest score, which is below 1, while seven speakers show the highest score at 5, suggesting that in their social network, there are only Australians of Chinese or Asian backgrounds. The mean score is 3.8 (SD = 1.2), while the median score is lower at 4.2. In general, the Chinese Australians have very homogeneous networks and there is no gender differentiation (p = 0.37) (women: mean = 3.6, SD = 1.06 vs. men: mean = 4.1, SD = 1.26): they primarily list Chinese (mean = 1.9, SD = 1.61) and Asian

friends (mean = 1.5, SD = 0.69), 12 of the 22 Chinese participants list no Anglos as part of their network, and for no one is more than one-half of their network Anglo.

For EOI, which includes social network and Cantonese proficiency scores as its components, out of the range of possible scores from 1 to 5, the lowest recorded score is 2.4 and the highest 4.4, suggesting that all participants exhibit a degree of orientation to their Chinese heritage and culture, but none orient solely to that background. The mean and median scores are similar (SD = 0.5), at 3.2 and 3.3, respectively. The narrowest range in EOI indicates that when we consider the overall picture, it appears more compressed.

Participants exhibit some differences across these measures. For instance, among the 7 speakers who belong to an Asian-only network, only 1 speaker—Isaac—reports a proficiency level of 5 in Cantonese. Additionally, the density of Cantonese speakers in his suburb is rated at only 1.4 out of 5. While there are some differences at the individual level among the measures, pairwise Wilcoxon signed-rank tests indicate that there are no statistically significant differences between any of the measures (p-values > 0.05), indicating that they essentially capture the same concept, which I interpret as ethnic background. I report on them separately because each provides a slightly different perspective on the nature of the Chinese community.

3.3 International Corpus of English-Hong Kong

One question in the work on ethnolectal variation is whether ethnic differences are attributable to substrate transfer. Both Horvath (1985) and Hoffman and Walker (2010) presented evidence to indicate that this is not the case, as features evident in the first generation's accented speech were not carried over to the second generation (Hoffman & Walker, 2010, p. 59). Here, we do not have speech samples of first-generation Cantonese-speaking immigrants, but we do have available to us a corpus of second language English speakers in Hong Kong in the International Corpus of English-Hong Kong component (ICE-HK (Bolton, 2002)), and we will use this as a benchmark.

ICE-HK is a part of the International Corpus of English (ICE) project, which aims to collect materials for comparative studies of English worldwide (see Greenbaum, 1996 for more details). Each ICE corpus consists of 500 texts totalling approximately 1 million words of spoken and written English from 12 different registers (e.g., face-to-face conversations, classroom lessons, business transactions, academic writing). Data were collected from 1990

to 2004, with participants aged 18 or above. They were all either born in the country where the relevant corpus was collected or moved there at an early age, and were educated through the medium of English. ICE corpora exist for the UK, Canada, India and Hong Kong, among others, and have been investigated comparatively and used as a reference corpus in many studies (e.g., Greenbaum, 1996; Greenbaum & Nelson, 2009; Hundt & Gut, 2012; Röthlisberger, Grafmiller, & Szmrecsanyi, 2017). In this thesis, only (THERE'S) in ICE-HK has been examined among the three variables under examination (Collins, 2012). However, the other two variables, namely, *the*+VOWEL and future temporal reference in ICE-HK, have not been investigated thus far.

In order to facilitate comparability with the Sydney Speaks corpus, from the spoken component of ICE-HK, I selected all transcriptions of face-to-face conversations (N = 90). The conversations come from a range of different settings and include different numbers of participants (from 2 to 5); based on the topics provided, some are informal (e.g., 'Conversation between classmates', 'Conversation among friends'), while others are more formal or structured (e.g., 'Discussion between tutor and students', 'Discussion of psychology project', 'Experience of teaching practice'). Thus, there are some differences in data type, but they are nevertheless comparable in being spontaneously produced speech from interactional contexts.

From the demographic information available, we selected those speakers who were born and raised in Hong Kong and speak Cantonese as their first language and Hong Kong English as their second language (128 out of 248 participants, from 87 of the 90 conversations[3]). This resulted in a total of 87 face-to-face conversations recorded between 1993 and 2000 with 128 Hong Kong English speakers (approximately 174,000 words).

Below is an excerpt from one such conversation between three young Hong Kong women about their experience of visiting Beijing in the summer, reproduced verbatim from the ICE-HK transcription (replicating their transcription conventions; see Appendix 4).

Wendy Chow:	*Uhm <,> so you want to go to Beijing this summer*
Iris Yip:	*Uhm <,,>*

[3] Each transcript involves between two and four speakers, but only those that meet the demographic requirements are included here. For instance, if there are four speakers (a, b, c, and d) in file A, and three of them (a, b, and c) do not meet the criteria, file A will be included with only speaker d remaining.

Wendy Chow:	*Have you make any concrete plans*
Iris Yip:	*Uhm not yet*
	But some of my friends <,> had visited <,> Beijing so <{> <[> I </[> will uh <,> contact them
Wendy Chow:	*<[> Uhm </[> </{>*
	Did you did they give you any advice
Iris Yip:	*<&> laughed </&> Not yet <&> laughed </&>*
Wendy Chow:	*Well I would advise you book your accommodation in advance because it's very difficult <,> to find a place in Beijing especially during the summer holiday*
	Uhm last year I go to Beijing and <,> I <,> I make a mistake
	I made a mistake didn't <,> because I didn't book <,> hotel in advance and I <,> I arrived four o'clock four o'clock in the morning <{> <[><,> </[> and I have no place <&>
	</&> to stay and I walked around the Beijing city <,>
	Uhm well it's a terrible experience
Gould Gaye:	*<[1> Ai yeah </[1> </{1>*
	Were you on your own </X>

(ICE-HK_S1A_002_Wendy Chow: 1:1-14:1)[4]

Table 4 illustrates the demographic breakdown of the participants from the ICE-HK included in this thesis. Among the 128 participants involved in this study, the average birth decade is the 1970s (ranging from 1942 to 1985), similar to the average birth decade of the Adults for the Sydney Speaks corpus. The age range spans from 18 to 60; however, the majority of participants (93%, 119 out of 128) are under the age of 30. Regarding gender, the only social factor available to me in ICE-HK, there are 104 women and 24 men. No information is given on the socioeconomic status of the speakers. ICE-HK does not lend itself to direct social comparisons with the Sydney Speaks data. I therefore conduct overall comparisons with the Sydney Speaks data, considering only the social factor of gender.

Another limitation is that there are no audio files available for this corpus, which makes it impossible to conduct any phonetic or phonological analyses. So, it cannot be used for the analysis of *the*+VOWEL. Nevertheless, ICE-HK does serve as a useful reference corpus for the English of the Chinese community in Australia when looking at variation at the morphosyntactic level, including future temporal reference and (THERE'S), allowing for potential substrate

[4] This gives the name of corpus, text number, recording number, and time stamps of the beginning and end of this excerpt.

transfer effects from Cantonese to be identified, to test whether these also emerge in the Australian Chinese community.

Table 4 Demographic breakdown of participants from ICE-HK.

Average birth decade	1970s	
Age range (years)	18-60	
Average age (years)	24	
Gender	**Women**	**Men**
Total speakers	104	24

Having introduced the Chinese community, the approach, the research questions, the data and the methodology for my thesis, now I will introduce variables of this study.

3.4 Variables for the thesis

This study, examining both sociophonetic and morphosyntactic features among Chinese Australians, aims to uncover the participation of this community in language change, including prevocalic definite article *the*, future temporal reference, and (THERE'S). These are good variables because they exhibit distinct timing of change and are influenced by a range of linguistic and social factors. And their comparison is particularly suitable for assessing language change within the broader context for Chinese Australians. Specifically, the variable prevocalic definite article *the* represents a relatively recent change, notably observed among younger speakers. Furthermore, its newer realisations, schwa and glottalisation, are favoured by women and ethnic minorities. In contrast, the future temporal reference system is an older change, yet its social conditioning remains largely unexplored. However, it shows stylistic variation with *will* being associated with formality. The change in *there's* + plural argument is the most advanced, notably linked with the working class. These variables provide a good opportunity to explore the intersection between ethnicity and other social factors, especially ethnicity's interplay with social class. Furthermore, investigating these variables will more systematically inform us of the conditioning of internal and external factors across variables and reveal the patterning of the speech of ethnic minorities.

3.4.1 Prevocalic definite article *the*

The definite article *the* is the most frequent word in English and has two main realisations, depending on whether it is followed by a consonant-initial or a vowel-initial word, as in *the air* [ði: e:] (prevocalic /ði:/) and *the hair* [ðə he:] (preconsonantal /ðə/) (Quirk, Greenbaum, Leech, & Svartvik, 1985). However, the realisation of the prevocalic definite article *the* is undergoing change in different English varieties, with the extension of /ðə/ to prevocalic contexts, including in American English (Raymond, Fisher, & Healy, 2002; Todaka, 1992), British English (Britain & Fox, 2009; Cheshire, Kerswill, Fox, & Torgersen, 2011; Fox, 2007, 2015), New Zealand English (Hay, Walker, McKenzie, & Nielsen, 2012; Meyerhoff, Ballard, Charters et al., 2021; Meyerhoff, Birchfild, Ballard et al., 2020), and Australian English (Cox, Penney, & Palethorpe, 2023).

This is a recent language change involving an increase in schwa and glottalisation, shown in apparent and real time, which has been documented in read and spontaneous speech (Cheshire, Kerswill, Fox, & Torgersen, 2011; Cox, Penney, & Palethorpe, 2023; Fox, 2015). This trend has been associated with ethnic minorities in various English-speaking regions, including Australia, where they have been proposed to be the drivers of this change. One real time study in Australian English shows a trend of increased glottalisation and schwa, particularly among Lebanese Australians (Cox, Penney, & Palethorpe, 2023). The data for this study is derived from read speech and it did not account for the influence of social class. Moreover, this variable has not been investigated among Chinese Australians. I will conduct further analysis of this variable, taking into account the influences of ethnicity and other social factors in the English of Chinese Australians. The findings will be presented in Chapter 4.

3.4.2 Future temporal reference

The future temporal reference system of English has been undergoing change for hundreds of years, and the gradual increase of *be going to* at the expense of *will* (illustrated in (1) and (2)), and the ongoing variation between them has received much attention across different varieties (e.g., Denis & Tagliamonte, 2018; Poplack & Tagliamonte, 1999; Szmrecsanyi, 2003, 2005; Torres Cacoullos & Walker, 2009). Social conditioning has not been extensively studied, although Poplack and Tagliamonte (1999, p. 336) did identify ethnic differences in usage rates and conditioning in a British-origin variety compared to two varieties of African American English.

(1)
*Her dad**'s not going to** come back.*

[SydS_AYF_033_Anna]

(2)
*I probably **will** go back next year.*

[SydS_CYM_063_Callum]

No previous studies have examined future temporal reference in Australian English. While identified as an ongoing change in other varieties of English, its social conditioning has not been systematically explored to date. To bridge these research gaps, I plan to analyse its patterns of variation using data from Sydney Speaks, considering the effects of ethnicity and other social factors. Additionally, I aim to compare these findings with data from Hong Kong English sourced from ICE-HK. This comparative analysis will facilitate an exploration of the potential effects of substrate transfer from Cantonese in shaping the English spoken by Chinese Australians. The results of this will be presented in Chapter 5.

3.4.3 Existential *there's* + plural argument

English existential constructions with plural arguments vary between plural and singular forms (illustrated in (3) and (4)). This variability has been studied in different varieties of English, including American English (Krejci & Hilton, 2017), Canadian English (Meechan & Foley, 1994; Walker, 2007, 2015, 2021), British English (Tagliamonte, 1998; Tagliamonte & Smith, 1999), Australian English (Eisikovits, 1991; El-Khaissi, 2017) and New Zealand English (Britain & Sudbury, 2002; Hay & Schreier, 2004), with different social effects emerging across the studies (as noted by Walker, 2007, p. 152). Singular form THERE'S tends to be more frequent in spoken-language data and in more casual speech styles (Eisikovits, 1991, p. 240; Martinez Insua & Palacios Martinez, 2003; Smallwood, 1997), and is favoured by younger speakers, indicative of change in progress (Britain & Sudbury, 2002, p. 219; El-Khaissi, 2017; Smallwood, 1997; Tagliamonte, 1998). This change seems to be led by working-class speakers (Eisikovits, 1991; El-Khaissi, 2017, p. 245), or less educated speakers (Meechan & Foley, 1994, p. 80).

(3)
***There's** some really really good ones*

[SydS_CYF_002_Karmen]

(4)

There are *some words that naturally pop up in –*

[SydS_CYF_002_Karmen]

Of particular interest here is that one study that compared across groups found that ethnic minorities were leading in this change, specifically, Māori in New Zealand (Britain & Sudbury, 2002, p. 219). Another study investigated this variable by British/Irish, Italian and Chinese Canadians, examining social and linguistic constraints (Walker, 2021, p. 168), and found that the singular form THERE'S (as in (3)) was favoured by the second-generation speakers regardless of their ethnic background, suggesting a change in progress in Canadian English that applied across ethnic groups. Furthermore, there was no evidence of language transfer; while based on the typological differences between the heritage languages, language transfer might be evident in higher rates of THERE ARE by the Italians, and lower rates (that is, more THERE'S) by the Chinese, but the reverse was the case (Walker, 2021, p. 178).

This variable shows ongoing change in the increased usage of THERE'S, and previous research has found that this variant is associated with the working class. Furthermore, some studies have indicated that ethnic minorities are at the forefront of this change. Thus, exploring this variable provides a good opportunity to examine specifically the intersection between ethnicity and social class. I will examine patterns of variation of this variable in the Sydney Speaks data and compare them with Hong Kong English data from ICE-HK. The findings from this analysis will be presented in Chapter 6.

Investigating this set of variables allows me to compare the differences in the speech patterning between the Chinese Australians and the Anglo Australians at both the sociophonetic and morphosyntactic levels, which would provide evidence to the nature of the Australian Chinese community, a growing and middle-class oriented speech community. Furthermore, prior research on these above linguistic variables in the English of ethnic minorities in other modern metropolises allows the current study to be situated in a broader context, providing comparisons of the role of ethnic minorities in language variation and change.

3.5 Statistical analyses

To analyse the data, I employ both descriptive and inferential statistical methodologies. I begin by presenting descriptive statistics that illustrate the distribution of social and linguistic predictors related to the linguistic variables being examined. Subsequently, to examine both the social and linguistic conditioning of these variable, I employ three multivariate modelling methods (cf., Denis & Tagliamonte, 2018, pp. 419-420; Tagliamonte & Baayen, 2012, p. 159), namely, Conditional Inference Tree, Random Forest and Mixed-effects Generalised Binomial Logistical Regression.

First, I annotate the social and linguistic predictors based on previous studies. Following this, I conduct descriptive analysis to understand the data distribution. Based on the distribution and observations in the data, I merge certain categories of a specific predictor to mitigate data sparsity and facilitate the subsequent multivariate analysis.

Second, there are a range of linguistic and social predictors that are potentially interacting with each other to condition the variation and change of the variables. For this reason, I first conduct exploratory analyses using recursive partitioning, including a conditional inference tree (Hothorn, Hornik, & Zeileis, 2006) and a random forest (Hothorn, Buehlmann, Dudoit et al., 2006; Strobl, Boulesteix, Zeileis, & Hothorn, 2007; Strobl, Malley, & Tutz, 2009) to partition out the constraints of the variation of the variables and identify the strongest predictors of the variation, and thus which predictors to include in further analyses (cf., Barth, 2019, p. 153).

The conditional inference tree is a non-parametric statistical model that "provide[s] estimates of the likelihood of the value of the [dependent] variable on the basis of a series of binary questions about the values of predictor variables" (Tagliamonte & Baayen, 2012, p. 159). The algorithm of this method includes three main steps. First, it calculates *p*-values for the relationship between each independent predictor and the dependent variable. Second, it selects the predictor with the lowest *p*-value and explores all possible binary splits on the chosen predictor and dependent variable (using permutation tests), and picks splits with the lowest *p*-value. Finally, it separates the data into these two groups and continues the process for each subgroup recursively until splits are no longer significant (cf., Hothorn, Hornik, & Zeileis, 2006). This method is especially useful "for visualizing the effect of multiple (potentially interacting) factors in data sets" (Denis & Tagliamonte, 2018, p. 420). I use the ctree() function from the *party* package (Hothorn, Hornik, & Zeileis, 2006) in R (R Core Team, 2024) to conduct the conditional inference tree models. Then, I employ random forest analysis to determine the

conditional importance of the predictors. As a random forest is based on numerous randomly selected subsamples of the same data, it provides us with a fuller picture of the data. This method is better at dealing with the overfitting issue faced by the conditional inference tree. Its results show the ranks of the predictors in order of what is most often selected. I used the cforest() function from the *party* package (Hothorn, Buehlmann, Dudoit et al., 2006; Strobl, Boulesteix, Zeileis, & Hothorn, 2007; Strobl, Malley, & Tutz, 2009) to conduct the random forest models. These tree-based modelling approaches have the advantage of allowing all variants to be included in a single analysis. Furthermore, since I have different class groups for each age-community group (e.g., no working class speakers for the Chinese group), these approaches allow for the inclusion of all available data points, providing an overview of the patterns across the different groups.

The tree-based modelling approach can reveal the interactions and the conditional importance of different predictors, but they do not give us a clear picture of the conditioning of the newer variants in relation to the conservative variants. Furthermore, these tree-based analyses do not take random effects such as Speaker and Word effects into account, which are essential to extend the generalisability of the findings beyond the current sample (Gries, 2021b). Thus, for a final analysis, I conduct mixed-effects regression models on the datasets. Mixed-effects regression analyses simultaneously estimate the effects of all predictors included in the model and considers "other potentially relevant covariates as well", such as Speaker and Word, which makes all linguistic hypotheses tested con-currently (Baayen, Davidson, & Bates, 2008, p. 399) and enables better generalisation of the findings beyond the particular sample studied here (Gries, 2015).

For the mixed-effects regression models, I follow a backward stepwise model selection procedure as suggested by Gries (2015) and Zuur, Ieno and Elphick (2010). Starting with a full model, I prune the model by removing non-significant predictors. I first prune the random-effects structure (e.g., Speaker and Word) using the *anova*() function and then prune the fixed-effects structure using the *drop1*() function, based on likelihood-ratio tests with a significance threshold set at 0.05. For significant interactions, pairwise comparisons are performed using the *emmeans* package, with Tukey HSD corrections applied (Lenth, 2023). During the modelling process, I also perform principal component analyses using the *rePCA*() function to assess the contributions of random-effect factors. I also conduct model diagnostics by checking for multicollinearity using Variance Inflation Factors (VIFs) and examined overdispersion through the analysis of residuals (Gries, 2021a). Finally, visualisations of the

results are generated using the *effects* package (Fox & Weisberg, 2019) and the *ggplot2* package (Wickham, 2016).

Chapter 4 Prevocalic Definite Article *the*

4.1 Introduction

The definite article *the* is the most frequent word in Standard Modern English (Leech, Rayson, & Wilson, 2001, p. 120), and is derived from a demonstrative pronoun in an earlier stage of English (Raymond, Fisher, & Healy, 2002, p. 616). According to prescriptive English grammar, it has two main realisations, depending on whether it is followed by a consonant-initial or a vowel-initial word, as in *the other* [ði: ˈɐðə] (prevocalic /ði:/) and *the same* [ðə ˈsæɪm]) (preconsonantal /ðə/) (Quirk, Greenbaum, Leech, & Svartvik, 1985, p. 254). This has been confirmed in corpus-based studies (Fox-Tree & Clark, 1997, p. 154; Jurafsky, Bell, Fosler-Lussiery et al., 1998) and is interpreted as a hiatus management strategy, with /ði:/ promoting the insertion of [j], preventing the VOWEL+VOWEL juxtaposition (e.g., *the end* [ði:jend]) (Berg, 2011, p. 35).

However, the realisation of prevocalic *the* (referred to as *the*+VOWEL hereafter) is undergoing change, with the extension of /ðə/ (referred to as schwa hereafter) to such an environment at the expense of /ði:/ (referred to as FLEECE hereafter) found for American English (Keating, Byrd, Flemming, & Todaka, 1994; Ladefoged & Johnson, 2015; Todaka, 1992), British English (Britain & Fox, 2009; Cheshire, Kerswill, Fox, & Torgersen, 2011; Fox, 2007, 2015), New Zealand English (Hay, Walker, McKenzie, & Nielsen, 2012; Meyerhoff, Birchfild, Ballard et al., 2020), and, most recently, Australian English (Cox, Penney, & Palethorpe, 2023). Another change is an increase in glottalisation or glottal stop in *the*+VOWEL contexts, as an alternative hiatus management strategy (e.g., *the end* [ði:ʔend]) (Britain & Fox, 2009, p. 189; Cox, Penney, & Palethorpe, 2023, p. 807; Ladefoged & Johnson, 2015, p. 18). In certain varieties of English, a similar type of variation concerning the indefinite articles *a/an* in pre-vocalic contexts is observed, with a leveling of *a* (Ash & Myhill, 1986; Pak, 2016; Raymond, Fisher, & Healy, 2002). However, in Sydney Speaks corpus, there are no instances of *a*+VOWEL, and this does not seem to have arisen in Australian English as yet.

the+VOWEL is an illuminating variable to examine when addressing my research questions regarding the role of ethnic minorities and the intersection of ethnicity and other social factors in language change. This is because the change of *the*+VOWEL has been reported to be led by ethnic minorities, particularly in ethnically diverse neighbourhoods. This understanding aligns with the notion that increased diversity plays a significant role in driving forward language

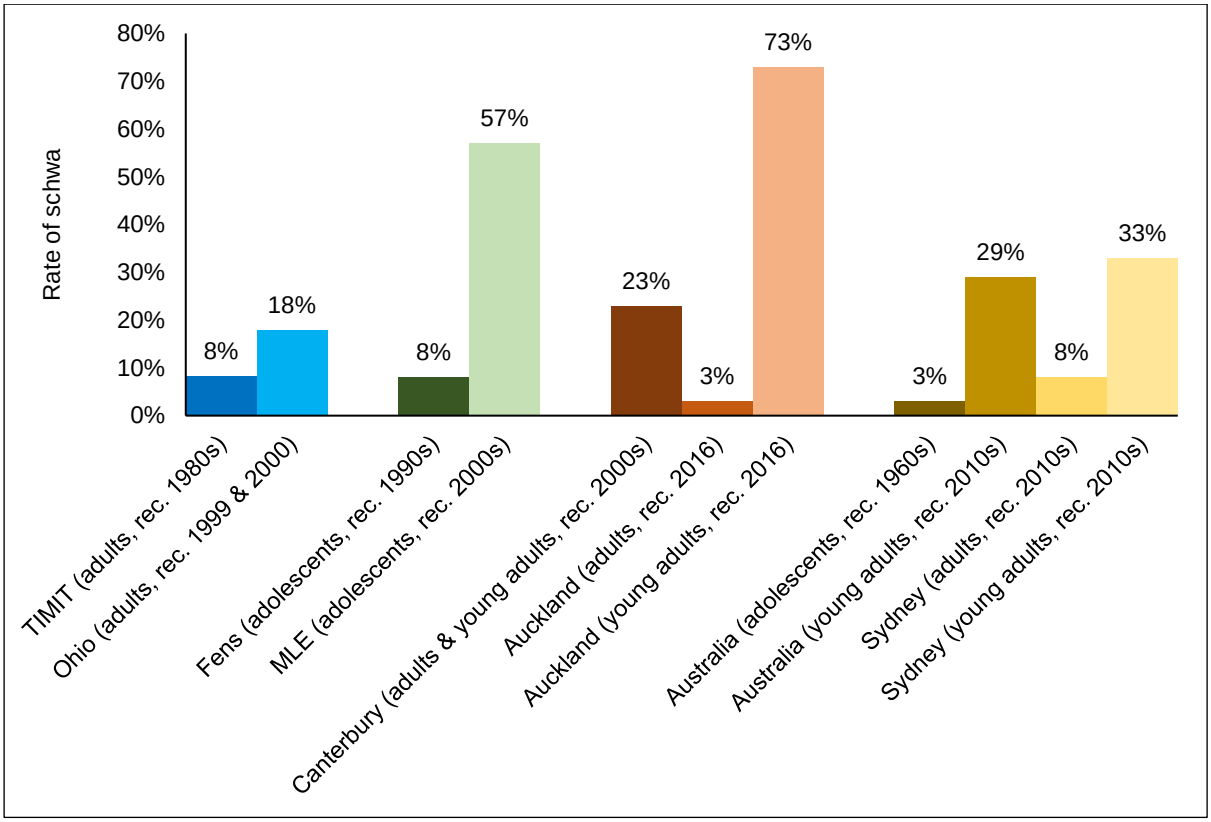
change (Ash & Myhill, 1986; Cheshire, Kerswill, Fox, & Torgersen, 2011; Cox, Penney, & Palethorpe, 2023; Fox, 2015; Meyerhoff, Birchfild, Ballard et al., 2020). Furthermore, as a relatively recent change, it allows me to examine the patterning of Chinese Australians in relation to a change in progress. However, there has been minimal investigation into the impact of other social factors on *the*+VOWEL, especially social class, which is one of the gaps that this study is filling.

4.2 Literature review

4.2.1 Timing of the change of *the*+VOWEL across varieties of English

Prior work on *the*+VOWEL has primarily focused on the increase of schwa relative to FLEECE over time, and prominent differences have been found. Figure 3 shows the rates of schwa vs. FLEECE at different time points in four varieties of English, namely, American English, British English, New Zealand English, and Australian English, aggregated from different studies (see notes following figure). The horizontal axis gives the specific names of the corpus or variety (with blue hues standing for American English, green – British English, red – New Zealand English, and yellow – Australian English) and the year of recording, and the vertical axis shows the rate of schwa relative to FLEECE. I have set aside FLEECE with glottalisation here, but will discuss this further below.

Figure 3 Rates of schwa (vs. FLEECE) of *the*+VOWEL realisations across varieties of English.



Notes: TIMIT (the Texas Instruments/Massachusetts Institute of Technology telephone corpus of American English) (Todaka, 1992, p. 40); Ohio (the Buckeye corpus of spontaneous American English speech) (Raymond, Healy, McDonnel, & Healy, 2009, p. 108); MLE (Multicultural London English) (Cheshire, Kerswill, Fox, & Torgersen, 2011, p. 187); Fens, England (Fox, 2015, p. 157); Canterbury, New Zealand (Hay, Walker, McKenzie, & Nielsen, 2012, p. 28); Auckland, New Zealand (Meyerhoff, Birchfild, Ballard et al., 2020, p. 75); Australia (Cox, Penney, & Palethorpe, 2023, p. 818); Sydney, Australia (Qiao & Travis, 2022, p. 57).

It is clear from this that there is an increase in schwa in newer data and by younger speakers. In an early study of *the*+VOWEL, Todaka (1992, p. 41) analysed the Texas Instruments/Massachusetts Institute of Technology (TIMIT) telephone corpus. This was published in 1988 and contained recorded readings of 2,342 scripted sentences from 630 speakers of 8 major dialects of American English (Keating, Byrd, Flemming, & Todaka, 1994, p. 132). This study confirmed that preconsonantal *the* tokens were categorically realised as schwa, but that schwa also occurred in *the*+VOWEL contexts, though it accounted for just 8% of the instances (20/242). A subsequent analysis of 15 Ohio English speakers in the Buckeye conversational corpus, compiled in 1999 and 2000 (Pitt, Johnson, Hume et al., 2005, p. 91),

found a higher rate of schwa in *the*+VOWEL contexts, at about 18% (Raymond, Healy, McDonnel, & Healy, 2009, p. 108).

In the UK, studies of Multicultural London English, an urban and ethnically heterogeneous variety, found that the rate of schwa was 57% for the adolescents (194/339) (sociolinguistic interviews recorded in the 2000s) (Cheshire, Kerswill, Fox, & Torgersen, 2011, p. 187). However, in the Fens, a rural area in South-Eastern England, the rate of schwa was at 8% for the adolescents (informal conversations recorded in the 1990s) (Fox, 2015, p. 157), which was much lower than that in Multicultural London English. These results indicate that the developmental trajectory of this change of more schwa might be sensitive to socioeconomic and regional stratification (the rural area being slower to adopt change) (Britain & Fox, 2009, p. 199).

In New Zealand, the same apparent time change was found where the younger speakers used a higher rate of schwa than the older speakers (Hay, Walker, McKenzie, & Nielsen, 2012, p. 29; Meyerhoff, Birchfild, Ballard et al., 2020, p. 74). Using data from the Canterbury Corpus, Hay, Walker, McKenzie and Nielsen (2012, p. 28) found a rate of 18% schwa (out of 493 tokens) in interviews with speakers born between 1933 and 1981 and recorded in the 2000s. In data collected in Auckland between 2016 and 2018 with 64 people of varying ages, Meyerhoff, Birchfild, Ballard et al. (2020, p. 73) found a prominent apparent time change with the younger speakers using a much higher rate of schwa at 73% than the older speakers at 3% (out of 747 tokens) (Meyerhoff, Birchfild, Ballard et al., 2020, p. 75).

In Australia, Cox, Penney and Palethorpe (2023) conducted a study comparing the realisation of *the*+VOWEL in real time from the 1960s to the 2010s. The 1960s data were from Mitchell and Delbridge (1965) (N = 1,315) and the 2010s data were from Australian Voices (Cox & Palethorpe, 2008) and AusTalk (Burnham, Estival, Fazio et al., 2011) (combined: N = 447). Unlike the other studies, which used spontaneous speech data, for this study, the data was recorded readings of the sentence “The plane flew down low over the runway then increased speed and circled *the aerodrome/airfield* a second time”, from which “the aerodrome” (1960s data) and “the airfield” (2010s data) were considered. The reading of “The grass was mown before *the uncontrollable* children came out to play” was also included in the 2010s data, from which “the uncontrollable” was considered (Cox, Penney, & Palethorpe, 2023, p. 810). The rate of schwa increased from 3% in the 1960s to 29% (130/447) in the 2010s (Cox, Penney, & Palethorpe, 2023, p. 818). Based on data collected from adult and young adult speakers in Sydney in the 2010s, Qiao and Travis (2022) analysed 1,174 instances of *the*+VOWEL. The

results revealed an apparent time change, as young adults exhibited a much higher usage of schwa compared to adults (8% vs. 33%) (Qiao & Travis, 2022, p. 5). Thus, the apparent time and real time studies for New Zealand English and Australian English provide evidence that the increase of schwa at the expense of FLEECE is a recent and ongoing change, with minimal schwa being reported for older speakers or in older data, and an increase up to over 50% among younger speakers (Meyerhoff, Birchfild, Ballard et al., 2020, p. 75).

The increase of glottalisation in the context of *the*+VOWEL has received less attention but has also been observed (Cox, Penney, & Palethorpe, 2023; Hay, Walker, McKenzie, & Nielsen, 2012; Ladefoged & Johnson, 2015; Todaka, 1992). As the vowel in prevocalic *the* and its following vowel form an adjacent vowel pair, glottalisation may be used to separate such consecutive sequences of vowels as a form of hiatus resolution (Cox, Penney, & Palethorpe, 2023, p. 821; Raymond, Fisher, & Healy, 2002, p. 647). Glottalisation is a common phenomenon that occurs more frequently in the VOWEL+VOWEL juxtaposition than in other contexts (e.g., VOWEL+OBSTRUENT, VOWEL+SONORANT) and in read than in spontaneous speech (Fuchs, 2015, p. 1675). In *the*+VOWEL contexts, studies often find that schwa is categorically followed by glottalisation (referred to as glottalised schwa hereafter) to avoid hiatus, for example, in Multicultural London English (Fox, 2015, p. 163). In this context, schwa without glottalisation (non-glottalised schwa hereafter) is vanishingly rare, as reported in studies of other varieties of English. Specifically, in American English, only 0.8% of the tokens were non-glottalised schwa (2/242) (Todaka, 1992, p. 46). In New Zealand English, the rate of non-glottalised schwa was higher, at 7% (55/820) (Hay, Walker, McKenzie, & Nielsen, 2012, p. 28). More recently, in a real time study of Australian English, it was reported that in the 1960s data, the rate of non-glottalised schwa was 2% (21/1315), but it decreased to only 0.2% in the 2010s data (1/447) (Cox, Penney, & Palethorpe, 2023, p. 818).

However, glottalisation with FLEECE in *the*+VOWEL contexts (glottalised FLEECE hereafter) appears to be more frequent. In American English, a study by Todaka (1992, p. 46) found that approximately 30% of FLEECE instances exhibited glottalisation (55/184). In New Zealand English, the occurrence of glottalised FLEECE was 16% (104/652) (Hay, Walker, McKenzie, & Nielsen, 2012, p. 208). An analysis of Australian English in real time revealed a rate of 8% glottalisation in the 1960s dataset (103/1281), increasing significantly to 52% in the 2010s dataset (166/317) (Cox, Penney, & Palethorpe, 2023, p. 818). These findings indicate that glottalised FLEECE needs to be taken into account as a potentially competing variant to better account for the changes in *the*+VOWEL.

In summary, within *the*+VOWEL contexts, there are four distinct variants that exhibit different patterns of change: FLEECE without glottalisation (non-glottalised FLEECE hereafter), glottalised FLEECE, non-glottalised schwa, and glottalised schwa. Among these variants, non-glottalised FLEECE appears to be dropping in use over time, while both glottalised schwa and glottalised FLEECE are increasing in use. This suggests that non-glottalised FLEECE represents an older form, whereas these glottalised variants represent newer forms of *the*+VOWEL. In contrast, non-glottalised schwa has been found to be exceedingly rare, and thus does not appear to be a competing variant for *the*+VOWEL.

4.2.2 Social conditioning: gender, class and ethnicity

In the previous section, we have established a recent change in the increase of both glottalised schwa and glottalised FLEECE across varieties. What is the role of social factors in this change, such as gender, class, and ethnicity?

An effect for gender has been found in Multicultural London English, where boys favoured schwa over girls (Fox, 2015, p. 167). In Australian English, during the 1960s, all speakers had a very low rate of schwa with men using slightly more schwa than women (women 1%, 7/761 vs. men 5%, 27/554), which was consistent with the gender differentiation in Multicultural London English (Cox, Penney, & Palethorpe, 2023, p. 817). However, in the 2010s, women were found to use more schwa than men (women 33%, 109/333 vs. men 18%, 21/114) (Cox, Penney, & Palethorpe, 2023, p. 817). Women also used a higher rate of glottalisation than men in both periods (1960s: women 11%, 81/761 vs. men 6%, 35/554; 2010s: women 74%, 247/333 vs. men 42%, 48/114) (Cox, Penney, & Palethorpe, 2023, p. 817). Furthermore, a significant three-way interaction between gender, glottalisation and vowel quality was found, with women producing more glottalisation with schwa in *the*+VOWEL (though not with FLEECE) (Cox, Penney, & Palethorpe, 2023, p. 817).

The effect of social class has not been systematically examined, but in New Zealand English, Hay, Walker, McKenzie and Nielsen (2012, p. 28) reported that non-professionals were leading in the increase of schwa. In Multicultural London English, the young men with a working class background used the highest rate of schwa (Cheshire, Kerswill, Fox, & Torgersen, 2011, p. 187). These two studies suggested that schwa may be associated with working class norms. However, in Australian English, women have been found to be leading the change of schwa, suggesting a possible association with prestige in this variety (Cox, Penney, & Palethorpe,

2023, p. 817). The inconsistency of the effects of gender and class deserves further investigation, which is addressed in this study.

The effects of ethnicity and the diversity of neighbourhoods have been widely examined in studies of *the*+VOWEL. Ash and Myhill (1986, p. 34) compared the realisations of four phonological variables in sociolinguistic interviews with 5 White, 19 African, and 3 Puerto Rican Americans (using their terms for designation). The variables were *the*+VOWEL, PRICE monophthongisation, t/d deletion, and word-final -n deletion. They found that, among all variables, the realisation of *the*+VOWEL "[was] the most sensitive to the effect of contact with white networks, since it [showed] the widest range of variation". In other words, ethnic minorities with fewer White Americans in their social network were more likely to use the incoming variant, schwa, while the White Americans were not sensitive to such social network effects (Ash & Myhill, 1986, p. 38). An interaction effect between ethnicity, gender, and social network on the realisation of *the*+VOWEL was also found in Multicultural London English (Cheshire, Kerswill, Fox, & Torgersen, 2011; Fox, 2007, 2015; Gabrielatos, Torgersen, Hoffmann, & Fox, 2010). Specifically, it was found that the Bangladeshi boys used schwa 81% of the time, higher than the rate of White Anglo/mixed race boys at 35% (Fox, 2015, p. 168). However, the White Anglo girls had not adopted schwa in *the*+VOWEL contexts into their speech at all (Fox, 2015, p. 168). These girls "[were] maintaining the forms of previous generations in adhering to the standard rule concerning article use" (Fox, 2015, p. 174). This pattern was attributed to the lack of social interaction of the girls with Bangladeshis, and the fact that no Bangladeshis were in the social network of the Anglo girls (Fox, 2015, p. 171). These findings corroborated Fox (2007) and Cheshire, Kerswill, Fox and Torgersen (2011, pp. 187-188) in that ethnic minorities led in the change of a higher rate of schwa in *the*+VOWEL contexts in Multicultural London English, and social network played a key role in the diffusion of this innovative form. In Auckland, New Zealand, the use of schwa in *the*+VOWEL contexts has been described as "a diagnostic of highly mixed communities" since three target communities with varying ethnic makeup showed different rates of its use (Meyerhoff, Birchfild, Ballard et al., 2020, p. 71). The highest rate of schwa was observed in South Auckland, known for its ethnically diverse population; this was followed by Mount Roskill in Central Auckland, which has been experiencing an increasing mix of ethnicities; Titirangi in West Auckland, described as "predominantly White", had a comparatively lower rate of schwa (Meyerhoff, Birchfild, Ballard et al., 2020, pp. 73-74). In Australia, it has been reported that the Lebanese Australians, and in particular women, lead in the change in that they have greater use of glottalisation than the Anglo Australians (Cox, Penney, & Palethorpe, 2023, p. 818). However, since Cox, Penney

and Palethorpe (2023) collected their data from read sentences, they were unable to analyse the impact of the phonological environment on *the*+VOWEL.

In summary, a consistent pattern reported for the social conditioning of these changes is the leading role of ethnically diverse speakers, including Bangladeshi boys in London, UK (Cheshire, Kerswill, Fox, & Torgersen, 2011; Fox, 2015), more diverse neighbourhoods in Auckland, New Zealand (Meyerhoff, Ballard, Charters et al., 2021; Meyerhoff, Birchfild, Ballard et al., 2020), and Lebanese Australians in Sydney, Australia (Cox, Penney, & Palethorpe, 2023). Beyond this, the results for the social nature of these changes vary. For instance, in the UK, young men were found to lead the increase in schwa (Fox, 2015, p. 167). In contrast, women were found to be in the lead in Australia (Cox, Penney, & Palethorpe, 2023, p. 817), and a similar tendency for young women was observed in New Zealand (Meyerhoff, Birchfild, Ballard et al., 2020, p. 77). While social class has not been widely examined, "non-professional" speakers were found to be ahead in these changes in New Zealand (Hay, Walker, McKenzie, & Nielsen, 2012, p. 28). Importantly, there has been no study that has investigated the intersections among these social factors. These inconsistencies indicate that a more systematic study that considers all these social factors and their interactions needs to be conducted to present a clearer picture of the social conditioning of *the*+VOWEL.

4.2.3 Linguistic conditioning

The linguistic factors conditioning this variation have been identified in these studies, including syllable stress of the following word, quality of the initial vowel of the following word, and frequency of *the*+VOWEL collocation. It has been found that in American English, when the word initial vowel in *the*+VOWEL collocation has primary syllable stress, the occurrence of glottalisation was almost categorical (97%, 63/65 (Todaka, 1992, p. 44)) and the rate of schwa was higher than that of FLEECE (Gaskell, Cox, Foley et al., 2003, p. 722; Raymond, Healy, McDonnel, & Healy, 2009, p. 102). However, this effect was not found to be significant in New Zealand English, according to Hay, Walker, McKenzie and Nielsen (2012, p. 28). In Auckland, New Zealand, among three neighbourhoods, syllable stress only had an effect on the older Titirangi speakers, the least ethnically diverse community, whereby schwa was favoured in stressed tokens, as "stressing a vowel-initial NP often involves insertion of a glottal stop" (Meyerhoff, Ballard, Charters et al., 2021, p. 360). In Australia, the effect of syllable stress on *the*+VOWEL has not been systematically examined yet (as noted by Cox, Penney, & Palethorpe, 2023, p. 822).

For vowel quality, a following word-initial high front vowel (e.g., *the individual*), favours schwa in sociolinguistic interviews and impromptu speech in American and New Zealand English (Gaskell, Cox, Foley et al., 2003, p. 722; Meyerhoff, Birchfild, Ballard et al., 2020, p. 76), interpreted as a dissimilation effect (Meyerhoff, Birchfild, Ballard et al., 2020, p. 76). Also, with high front vowels, glottalisation in *the*+VOWEL contexts tended to occur more frequently (Todaka, 1992, p. 46). The opposite effect has been reported for recorded readings of scripted sentences in Australian English, where the low vowel STRUT in the word *uncontrollable* favoured the use of schwa and glottalisation (Cox, Penney, & Palethorpe, 2023, p. 822). This has been argued to be the result of an assimilatory process, whereby the vowel in *the* is coarticulated with the STRUT vowel in *the uncontrollable* bigram (Cox, Penney, & Palethorpe, 2023, p. 823). However, as the only vowels in this study were STRUT and DRESS from three scripted sentences, we do not know whether this is a more general pattern or specific to these vowels.

Additionally, the relative frequency of co-occurrence of *the* with the following word has been found to interact with glottalisation and the realisation of *the*+VOWEL, such that in the glottalised tokens, *the*+VOWEL in more frequent collocations (e.g., *the Olympics* vs. *the expression*) was more likely to be realised as schwa than in less frequent collocations (Hay, Walker, McKenzie, & Nielsen, 2012, p. 30).

One other linguistic variable that has been noted is that of word class of the following word, as noun vs. adjective (*the other, the only* vs. *the end, the area*). In a controlled production study, Raymond, Fisher and Healy (2002, p. 629) found no significant effects for noun versus adjective. Qiao and Travis (2022) did, however, find a weak effect in the Sydney Speaks data which combined Anglo, Chinese and Italian Australians, with glottalised FLEECE being favoured by adjectives over nouns, but no such effect for schwa (Qiao & Travis, 2022, pp. 58-59). I initially tested this predictor in the current analysis, and found no effect for glottalised FLEECE or for schwa, and thus I do not consider it further. There may also be an interaction between word class and the following vowel (Qiao & Travis, 2022, p. 59), although we do not have sufficient data to test this here.

In summary, *the*+VOWEL is a relatively recent change observed in various English varieties, with two incoming variants, glottalised FLEECE and schwa. While ethnic minorities and speakers residing in ethnically diverse neighbourhoods have been reported to lead in the increased use of these newer variants, the influence of other social factors varies across studies. For instance, in Multicultural London English, young boys are at the forefront of the

schwa change, whereas in Australian English, women play a leading role in this change. Linguistic conditioning reveals that stressed and high front vowels following *the*, and less frequent collocations of *the* and vowel-initial words favour the incoming variants, glottalised FLEECE and schwa. However, some studies do not find significant effects of these linguistic factors. Consequently, a clear understanding of the conditioning of this variable remains elusive, necessitating further investigation while considering all the aforementioned factors. To address these research gaps, this study aims to look at the intersection of ethnicity and class and compare linguistic conditioning over time by exploring the timing of change of *the*+VOWEL in Australian English and investigating whether an apparent time change exists, wherein younger speakers use the newer variants, schwa and glottalised FLEECE, at higher rates compared to older speakers. Moreover, I am interested in understanding how these changes are adopted across social groups among Anglo Australians, and I am examining the role of Chinese Australians in this change.

4.3 Methodology

4.3.1 Circumscribing the variable context

The methodology followed for extraction was as outlined in Qiao and Travis (2022, p. 57). Namely, all instances of *the* preceding a vowel-initial word were extracted by using the relevant search function[5] in LaBB-CAT (Fromont & Hay, 2012) where the Sydney Speaks corpus is housed (Travis, 2014-2022), giving an initial total of 1,419 tokens. Tokens in the following cases were set aside: tokens in overlap (as when two speakers were talking at once it was difficult to accurately identify the vowel quality); where there was background noise; where *the* was not immediately followed by another word (including those followed by a pause, a filled pause such as *uh*, *um*, or truncation) (n = 407). All remaining tokens were auditorily coded blind by two trained listeners[6], with spectrograms also reviewed in Praat (Boersma & Weenink, 2023) in some cases for clarification. Tokens were coded both for the realisation of the vowel in *the* (vowel type: FLEECE vs. schwa) and for glottalisation following the vowel (presence vs. absence), without distinguishing type or duration of glottalisation, following Cox, Penney and Palethorpe (2023, p. 813). Coders also noted cases where they were unable to make a

[5] The regular expression used is “the + [IE\{@UVQi#\$u312456789].*”.

[6] I thank Benjamin Purser and Thomas Powell-Davies for assistance with the coding.

determination, including where the vowel in *the* was assimilated with the following vowel (n = 15) (see also Meyerhoff, Birchfild, Ballard et al., 2020, p. 73), and instances of emphatic *the* (n = 2, both of which were realised as FLEECE with no glottalisation). These tokens were excluded from analysis.

All discrepancies between the coders were checked by a third coder, auditorily for vowel type (n = 123) and by reviewing the spectrograms in Praat for glottalisation (n = 71). In most cases, this allowed for a determination to be made, though a small number of cases were unidentifiable, generally due to assimilation with the following vowel, and these were excluded from analysis (n = 37). This left a total of 958 tokens which had been coded both for vowel type and glottalisation.

Figure 4 represents the distribution of the four possible realisations. As can be seen, non-glottalised FLEECE (the older form) is the majority variant, accounting for close to two-thirds of all instances (n = 643). The remaining tokens are largely made up of glottalised FLEECE (13%, n = 122) and glottalised schwa (18%, n = 170). Non-glottalised schwa is vanishingly rare (2%, n = 23), as also reported in studies of other varieties of English (as described in Section 4.2). Non-glottalised schwa was therefore set aside in the analyses that follow, leaving a total of 935 tokens for analysis distributed across three variants.

Figure 4 Distribution of the four variants for *the*+VOWEL.

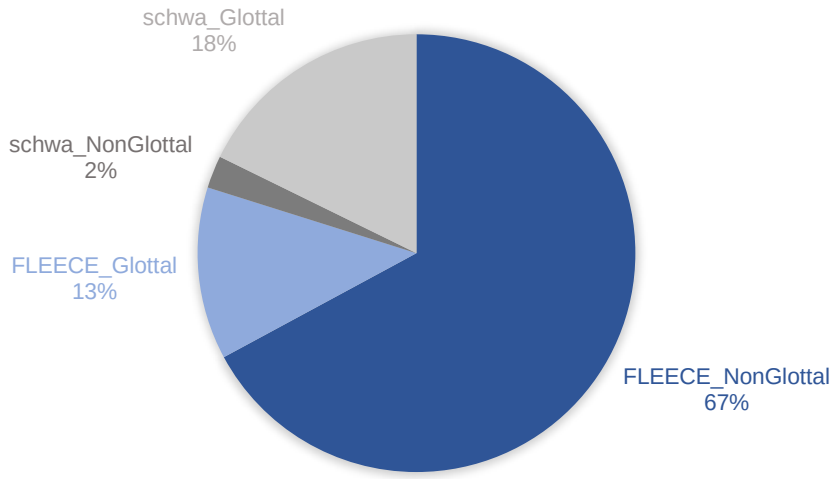
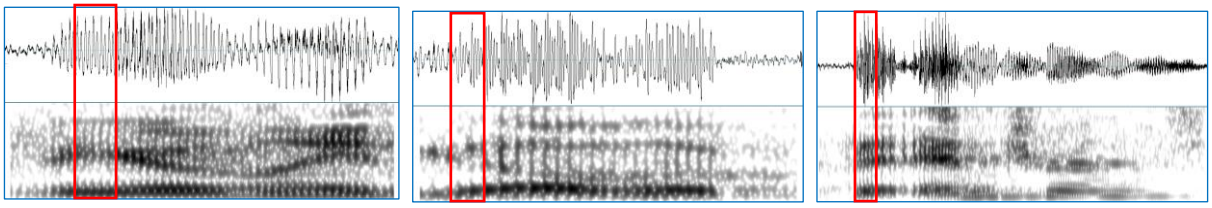


Figure 5 presents spectrographic representations of each of these three main variants. Non-glottalised FLEECE appears on the left where no stop closure between *the* and the following

vowel is evident, in contrast with the irregular glottal vibrations seen in the glottalised realisations in the middle (also for FLEECE) and on the right (for glottalised schwa, which I will simply refer to as schwa hereafter).

Figure 5 Spectrographic representations of three variants for *the*+VOWEL.



non-glottalised FLEECE: *the only* glottalised FLEECE: *the other* schwa: *the entrance*

4.3.2 Statistical analyses

As described in Section 3.5, I employ both descriptive and inferential statistical methodologies to analyse the data. Three types of inferential statistical methods have been employed: Conditional Inference Tree, Random Forest, and Mixed-effects Generalised Binomial Logistic Regression. Here, I describe the specifics of the mixed-effects generalised binomial logistic regression models for *the*+VOWEL.

To examine the variation between conservative and newer variants and to validate the findings obtained from the tree-based exploratory analyses, I conduct separate analyses on the alternation between glottalised FLEECE and non-glottalised FLEECE as well as between schwa and non-glottalised FLEECE using mixed-effects logistic regression models. The reasons I choose to conduct two independent binomial regression models on the three variants instead of utilising a single multinomial regression model are twofold. Firstly, "multinomial regressions are a series of binary regressions" (Gries, 2013, p. 322), implying that while multinomial regression allows for the analysis of the entire dataset, it primarily generates pairwise comparisons between two values of the dependent variable (Fahy, Egbert, Szmrecsanyi, & Biber, 2022, p. 205). This suggests that the outcomes of two independent binomial regression models on the same dataset align closely with those obtained from a single multinomial regression model, as validated in a study examining three-way genitive variation in English by Fahy, Egbert, Szmrecsanyi and Biber (2022), which encompasses noun + noun sequences, the *'s* variant, and the *of* variant (e.g., *prison doors* vs. *prison's doors* vs. *doors of the prison*). Secondly, as depicted in Figure 4, non-glottalised FLEECE stands as the predominant variant. However, as reviewed in Section 4.2, the shift from this conservative variant to the newer variants—schwa and glottalised FLEECE—is a recent change driven by younger speakers.

Therefore, analysing these variants separately provides a better understanding of their change and conditioning.

In each model, the realisation of *the*+VOWEL served as the dependent variable (predicting glottalised FLEECE and schwa respectively). Random intercepts were included for Speaker and Word. Approximately one half of all word types occurred only once in the data, and they were pooled into a single level. Considering their infrequent occurrence, these word types were unlikely to have lexically specific probabilities, and including them could overly influence the model due to lexical idiosyncrasies (Barth & Kapatsinski, 2018, p. 103; Szmrecsanyi, Grafmiller, Heller, & Röthlisberger, 2016, p. 9; Travis & Torres Cacoullos, 2021, p. 5). However, it is important to note that the independent variables included in the models varied due to different data configurations.

Specifically, the regression analysis process involves three steps. Firstly, to evaluate changes over time within the majority community, I examine the patterning of these variations among Anglo Australians across the two age groups, comparing Adults and Young Adults (n speakers = 53). Secondly, to assess the influence of ethnicity on language change, I analyse the patterning among Young Adults, making a comparison between Young Adult Anglo Australians and Chinese Australians (n = 41). Due to the absence of working class Chinese Australians in the sample, the working class Anglo Australians are excluded in the second analysis to ensure data comparability across class groups. Thirdly, to assess the impact of ethnic orientation of Chinese Australians, four independent models were carried out for the Chinese Australians only (n = 22), one for each of the four measures of ethnic background: ethnic orientation, social network, self-reported Cantonese proficiency, and Cantonese-speaking density in the suburb. In total, twelve independent regression analyses are conducted and presented in the results below.

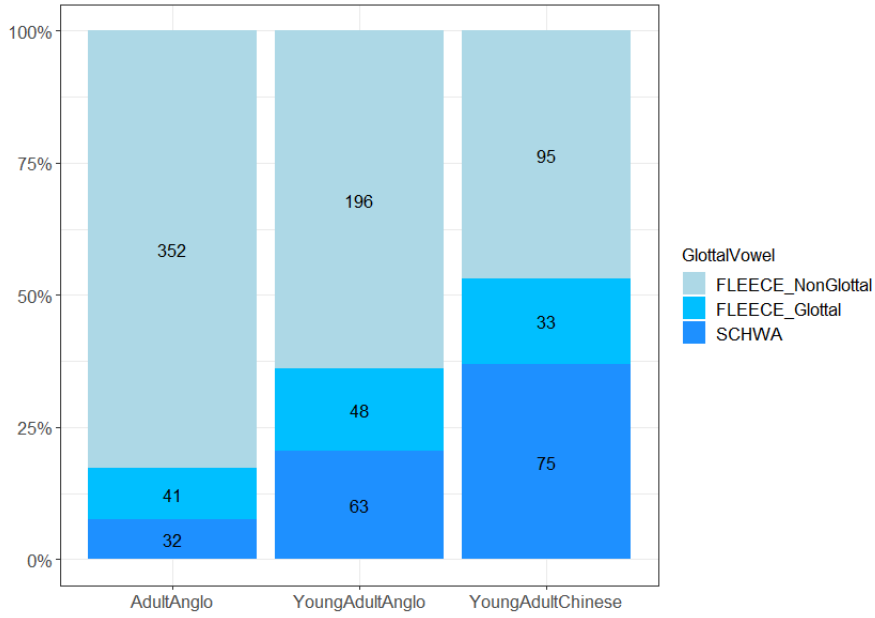
4.4 Data distribution for the predictors

All of the target tokens were annotated to determine the social and linguistic conditioning of the variation. As reviewed in Section 4.2, these constraints include social factors age, community, gender, social class, and linguistic factors syllable stress, height of following vowel, and forward transitional probability. Their annotations and distributions are detailed below.

4.4.1 Age and community

I begin by considering the overall distribution of the three variants across age and community, to gain an overview of the change in Australian English. Figure 6 presents the rates of the three variants for the Adult Anglo Australians in the first column, followed by the Young Adult Anglo and Chinese Australians in the second and third columns, respectively. The proportions of non-glottalised FLEECE, glottalised FLEECE, and schwa (adding up to 100 % for each age group) are illustrated in light blue, blue, and darker blue, respectively. The raw token numbers of each variant are provided in each bar.

Figure 6 Distribution of *the*+VOWEL realisations by Age and Community.



This chart shows that, for the Adult Anglos, the non-glottalised FLEECE variant is overwhelmingly dominant, accounting for 83% of occurrences. In contrast, the other two variants, glottalised FLEECE and schwa, each represents less than 10% of usage (10% and 8% respectively). However, a notable shift in the rate of use is observed among Young Adults, including both Anglo and Chinese Australians. Specifically, for the Young Adult Anglos, the proportion of non-glottalised FLEECE has substantially decreased to 64%, while both glottalised FLEECE and schwa have experienced an increase, reaching 16% and 21%, respectively. For the Young Adult Chinese, the proportion of non-glottalised FLEECE has further decreased to 48%, while both glottalised FLEECE and schwa have experienced a greater increase, reaching 16% and 37%, respectively. Interestingly, the rate of glottalised FLEECE is the same for both

Young Adult Anglos and Chinese, but Chinese Australians have a noticeably higher rate of schwa than Anglo Australians.

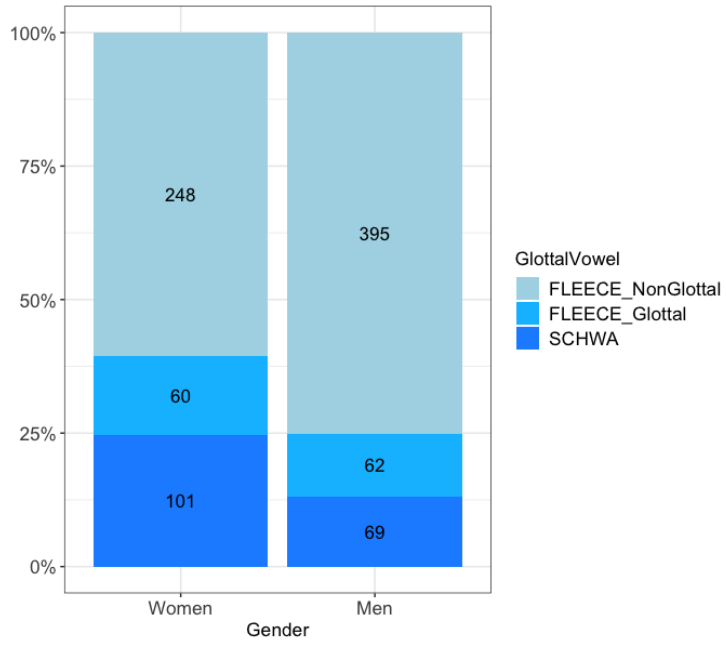
These patterns indicate that Australian English, like other varieties of English examined in previous studies, has undergone an apparent time change in *the*+VOWEL (Hay, Walker, McKenzie, & Nielsen, 2012; Meyerhoff, Birchfild, Ballard et al., 2020; Todaka, 1992). Furthermore, consistent with other reports, the ethnic minority appears to be ahead in this change of more schwa (Ash & Myhill, 1986; Cheshire, Kerswill, Fox, & Torgersen, 2011; Cox, Penney, & Palethorpe, 2023; Meyerhoff, Ballard, Charters et al., 2021).

4.4.2 Gender

Figure 7 shows the proportional distribution of *the*+VOWEL realisations by Gender. This figure shows that among women, the rate of non-glottalised FLEECE is 61%, while the rates of glottalised FLEECE and schwa are 15% and 25% respectively. In comparison, men demonstrate a higher rate of non-glottalised FLEECE, at 75%, and lower rates of glottalised FLEECE and of schwa, at 12% and 13% respectively.

Note that the gender difference for glottalised FLEECE is minimal (15% vs. 12%), but greater for schwa (25%vs. 13%). Hence, schwa exhibits higher social sensitivity as it is subject to both ethnic and gender-based differentiation. This observation aligns with the findings of Cox, Penney and Palethorpe (2023, p. 817) in Australian English and Meyerhoff, Birchfild, Ballard et al. (2020, p. 77) in New Zealand English, which report a similar trend of women using schwa more frequently. Notably, this pattern differs from that observed in Multicultural London English, where boys tend to employ schwa more often (Fox, 2015, p. 167).

Figure 7 Distribution of *the*+VOWEL realisations by Gender.

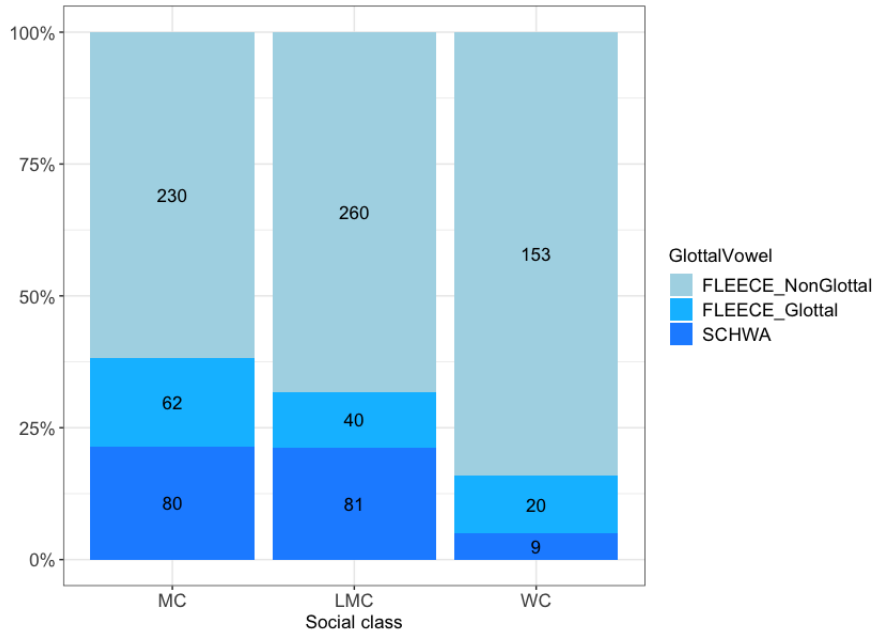


4.4.3 Social class

Figure 8 provides the distributional patterns among different class groups. The Middle Class (MC) speakers in the first column have the lowest rate of non-glottalised FLEECE at 62%, the Lower Middle Class (LMC) speakers in the second column a slightly higher rate at 68%, and the Working Class (WC) speakers in the third column a much higher rate at 84%. Regarding glottalised FLEECE, the MC speakers have a usage rate of 17%, which is higher than the rates used by LMC and WC speakers, both at 10% and 11% respectively. In terms of schwa usage, the MC and LMC speakers show similar rates at 22% and 21% respectively. However, the WC speakers demonstrate a remarkably low rate of only 5%. Thus, the WC speakers appear to be the most conservative, with the highest rate of the older variant, non-glottalised FLEECE, and the lowest rate of the newer variant, schwa. This distribution differs from that observed in New Zealand, where non-professionals use schwa at a higher rate (Hay, Walker, McKenzie, & Nielsen, 2012, pp. 28-29). The class difference for glottalised FLEECE is less pronounced, as its rate remains consistent across all class groups.

Schwa appears to be more sensitive to all three social factors compared to glottalised FLEECE. Therefore, it is crucial to examine their combined effects, which I will conduct through multivariate analysis below.

Figure 8 Distribution of *the*+VOWEL realisations by Social Class.



4.4.4 Syllable stress

Syllable stress of the first vowel in the following word was coded as a binary variable, distinguishing between stressed, as in example (5), and unstressed tokens, as in example (6). Based on findings in the previous literature, I hypothesise that stressed tokens would favour both glottalised FLEECE and schwa.

The distribution in Figure 9 shows that for the stressed tokens (e.g., *other, only, east, Asian*), the rate of non-glottalised FLEECE is 64%, while the rates of glottalised FLEECE and schwa are 14% and 22% respectively. For the unstressed tokens (e.g., *Australian, Italian, idea, amount*), the rate of non-glottalised FLEECE is substantially higher at 83%, while the rates of glottalised FLEECE and schwa are much lower at 9% and 7% respectively.

(5) Stressed:

*And at **the end** of the day it was only seven months,*

([ðə ˈend]$_{SCHWA}$)

(SydS_AYF_092_Kylie)

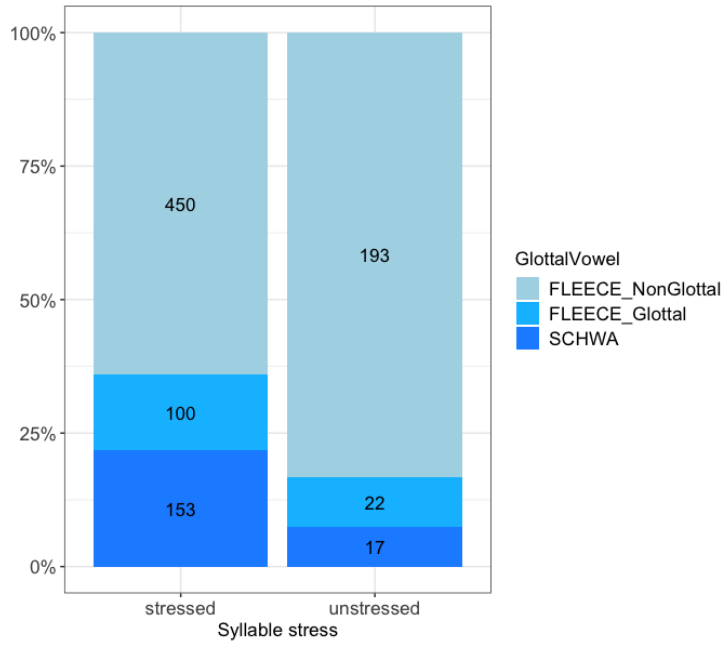
(6) Unstressed:

*.. and **the amount** of money they're spending on it,*

([ðiː əˈmæɔnt]$_{FLEECE_NonGlottal}$)

(SydS_AOF_005_Jamie)

Figure 9 Distribution of *the*+VOWEL realisations by Syllable Stress.



These patterns indicate that compared with unstressed tokens, in stressed tokens, both glottalised FLEECE and schwa are more frequent, which support the hypothesis of this study and align with previous studies of the effect of syllable stress (Gaskell, Cox, Foley et al., 2003, p. 722; Raymond, Healy, McDonnel, & Healy, 2009, p. 102; Todaka, 1992, p. 44).

4.4.5 Height of following vowel

schwa has been found to be favoured with high front vowels more than other vowels (Gaskell, Cox, Foley et al., 2003, p. 722; Meyerhoff, Birchfild, Ballard et al., 2020, p. 76), which has been proposed to be a dissimilation process, avoiding two high front vowels adjacent to one another in *the*+VOWEL contexts (Meyerhoff, Ballard, Charters et al., 2021, p. 356). Also, with high front vowels, glottalisation tends to be more frequent (Todaka, 1992, p. 46). These studies often classified the type of following vowel based on its height and frontness, distinguishing high front (e.g., DRESS, NEAR) and low central vowels (e.g., STRUT, START) (Cox, Penney, & Palethorpe, 2023, p. 822; Meyerhoff, Birchfild, Ballard et al., 2020, p. 76). Based on the observation of the patterning in the data, the following vowels were classified to be high vowels (e.g., KIT, FLEECE; frequent forms are *Italian, eastern*), mid vowels (e.g., GOAT, DRESS, LOT; frequent forms are *only, end, Australian*), and low vowels (e.g., STRUT, TRAP, FACE; frequent

forms are *other, accent, Asian*), making a three-way height distinction of the following vowels, as shown in the examples.

(7) High:

*... So I've been kind of all along **the east** coast?*

([ðə ˈiːst]$_{SCHWA}$)

(SydS_CYF_036_Rachel)

(8) Mid:

*... That's **the only** thing I wouldn't put in public.*

([ðiː ˈæɔnlɪ]$_{FLEECE_NonGlottal}$)

(SydS_AOM_067_Marshall)

(9) Low:

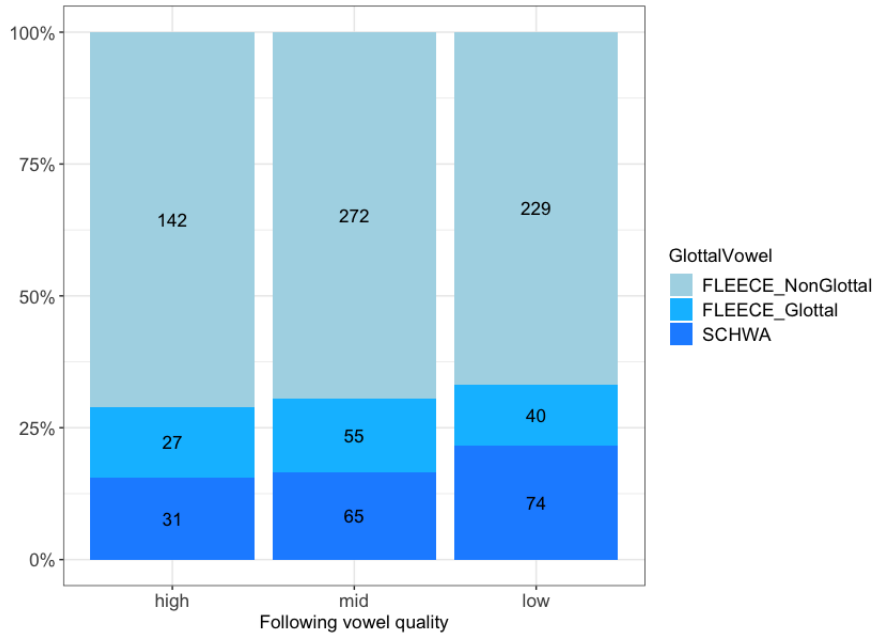
*... like you need to have .. **the other** s- skills,*

([ðiː ˈɐðə]$_{FLEECE_NonGlottal}$)

(SydS_CYF_048_Sarah)

Figure 10 illustrates the distributions of the three types of following vowels. When high vowels follow the prevocalic *the*, the rate of non-glottalised FLEECE is 71%, while the rates of glottalised FLEECE and schwa are 14% and 16%, respectively. For following mid vowels, the distributions of the three variants are similar to those with high vowels. The rate of non-glottalised FLEECE is 69%, while the rates of glottalised FLEECE and schwa are 14% and 17%, respectively. Likewise, when low vowels follow the prevocalic *the*, the rate of non-glottalised FLEECE is 67%, while the rates of glottalised FLEECE and schwa are 12% and 22%, respectively. Consequently, the distributions of *the*+VOWEL variants across the three types of vowel heights are very similar.

Figure 10 Distribution of *the*+VOWEL realisations by Following Vowel.



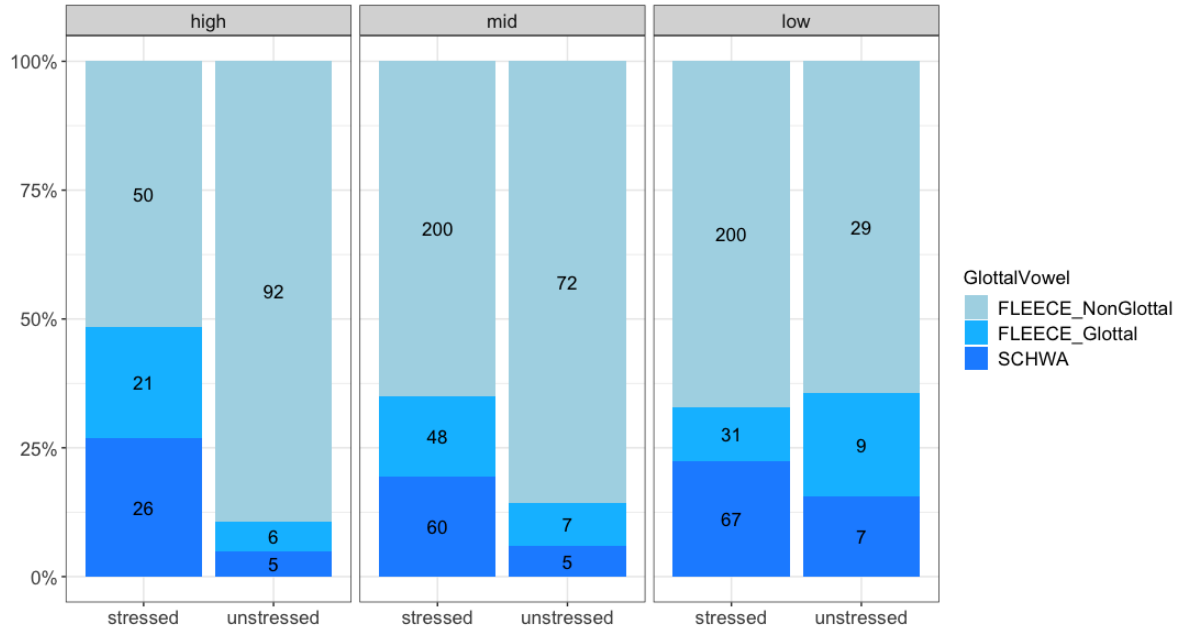
However, Cox, Penney and Palethorpe (2023, p. 823) observed "an assimilatory process whereby the unstressed vowel in [*the*+VOWEL] is highly coarticulated with the following low vowel" based on their analysis of two contexts. They suggested conducting a more detailed examination of the interaction between syllable stress and the height of the following vowel, something which was not possible in their work because their data was from read sentences that do not allow for the consideration of the phonological environment in *the*+VOWEL. To do this, I visualise the distribution of this interaction in Figure 11, which gives three types of Following Vowel on the top x-axis and two types of Syllable Stress on the bottom x-axis.

This shows that with stressed high vowels, the rates of newer variants glottalised FLEECE and schwa are 22% and 27%, respectively. In contrast, with unstressed high vowels, these rates drop to 6% and 5%, respectively. Similarly, with stressed mid vowels, the rates of newer variants are higher at 16% and 19%, compared to 8% and 6% with unstressed mid vowels. However, the patterns for low vowels exhibit some differences. With stressed low vowels, the rate of glottalised FLEECE is 10%, whereas with unstressed low vowels, it increases to 20%. Conversely, for schwa, the rate is 22% with stressed low vowels and slightly lower at 16% with unstressed low vowels.

These patterns suggest a prominent interaction between the height of the following vowel and syllable stress. Stressed tokens tend to have higher rates of schwa regardless of the type of following vowel, while stressed high and mid vowels, as well as unstressed low vowels, tend

to trigger higher rates of glottalised FLEECE. To evaluate the statistical significance of this interaction, it is included in the following multivariate models.

Figure 11 Distribution of *the*+VOWEL realisations by Following Vowel and Syllable Stress.



4.4.6 Forward transitional probability

The relative frequency of the word following *the* has been found to be a significant predictor of both schwa and glottalisation in *the*+VOWEL contexts (Hay, Walker, McKenzie, & Nielsen, 2012, p. 30). Here, I use the forward transitional probability to measure the likelihood of the words in a context following *the*. This measure has been widely used to predict word or morpheme boundaries in speech (Saffran, Newport, & Aslin, 1996). Two words or morphemes with a low transitional probability are less likely to co-occur, suggesting that they are less likely to represent a single unit. On the contrary, a high transitional probability indicates that the co-occurrence of two words or morphemes is more likely, and they are more likely to function as a single unit. Here, if *the* and its following vowel-initial word do not function as a single unit, then there is more likely to be a prosodic boundary between them. Thus, I hypothesise that a lower forward transitional probability (indicating a less frequent combination, and a more salient prosodic boundary) is associated with higher rates of newer variants glottalised FLEECE and schwa, as the prosodic boundary or hiatus in *the*+VOWEL contexts are frequently resolved by glottalisation (Cox, Penney, & Palethorpe, 2023, p. 822; Hay, Walker, McKenzie, & Nielsen, 2012, p. 30). In contrast, a higher forward transitional probability (indicating a more frequent

combination, and a less salient prosodic boundary) is associated with lower rates of newer variants glottalised FLEECE and schwa.

The forward transitional probability between two linguistic units *a* and *b* is the probability of *b* given *a*. It is equivalent to the conditional probability in mathematics and can be represented as *P*(*b*|*a*) as follows:

$$P(b|a) = \frac{P(ab)}{P(a)}$$

where *P*(*ab*) is the probability of the bigram *ab*:

$$P(ab) = \frac{number\ of\ ab\ bigrams}{total\ number\ of\ bigrams}$$

and *P*(*a*) is the probability of *a*:

$$P(a) = \frac{number\ of\ a_\ bigrams}{total\ number\ of\ bigrams}$$

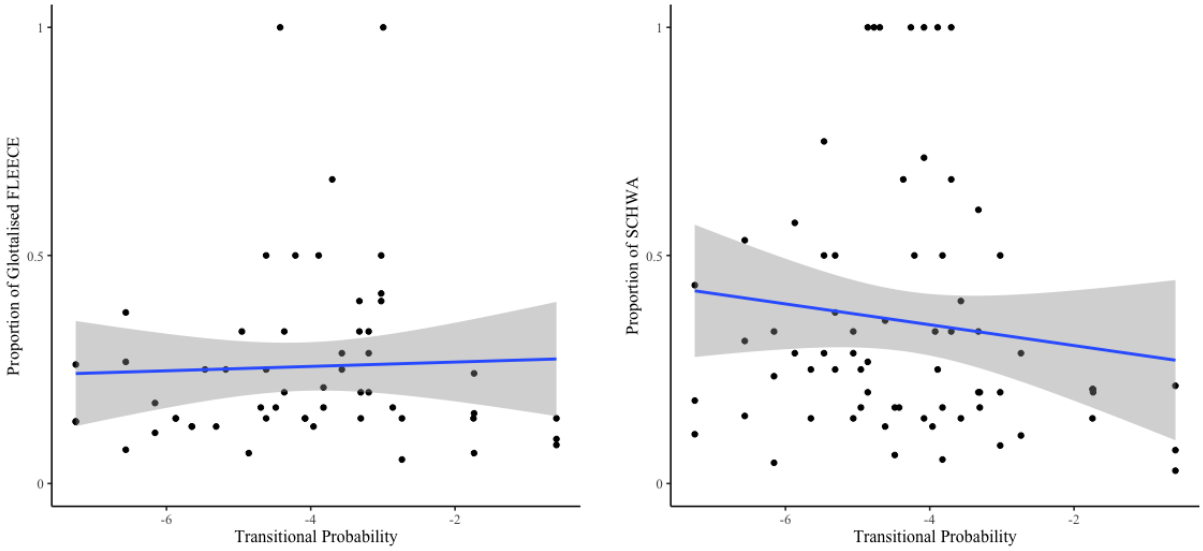
I demonstrate the calculation of the forward transitional probability with the phrase *the other* which is the most frequent *the*+VOWEL bigram in the present data (n = 783). Out of a total of 1,419 tokens of *the*+VOWEL, the transitional probability for *other*, or *P*(*the other*) = 783/1419 = 0.552.

A Shapiro-Wilk normality test showed that the forward transitional probability is not normally distributed (W = .608, p < 0.001), meaning that statistical analyses of this factor may yield invalid results across the *the*+VOWEL combinations. I therefore log-transformed the forward transitional probability to make it as normally distributed as possible, thus increasing the validity of the analyses (Feng, Wang, Lu et al., 2014, p. 105).

The distribution of transitional probability is presented in Figure 12. The horizontal axes represent the values of transitional probability, with a higher frequency of the collocation between prevocalic *the* and its following word positioned towards the right. The vertical axis of the figure shows the proportion of glottalised FLEECE on the left panel and the proportion of schwa on the right. For glottalised FLEECE, there is little impact of it, as evidenced by the flat line in the graph. On the other hand, for schwa, there is a stronger tendency for a higher rate of schwa to be associated with lower transitional probability (less frequent combinations).

These patterns suggest that transitional probability may have more of an impact on schwa than glottalised FLEECE.

Figure 12 Distribution of glottalised FLEECE (left) and schwa (right) (vs. non-glottalised FLEECE) by Transitional Probability with smoothed regression lines (dots represent individual tokens).



As we have seen in the data distributions described above, there is variability in the effects of both social and linguistic factors. The Young Adults, the Chinese Australians, and women use higher rates of both newer variants compared with the Adults, the Anglo Australians, and men, respectively. As for the social class, the middle class speakers use the highest rates of both newer variants in comparison with the lower middle and working class speakers; the working class speakers use the lowest rate of schwa. Regarding linguistic conditioning, stressed tokens occur with higher rates of both newer variants, and vowel height appears to have little effect for unstressed vowels, but with stressed vowels, there is an effect, with stressed high and mid vowels, and unstressed low vowels occurring with a greater rate of glottalised FLEECE. For transitional probability, it does not seem to have an effect on glottalised FLEECE, but there is a tendency for schwa, such that lower transitional probability (less frequent combinations) triggers a higher rate of schwa. From these distributional patterns, we can tell there are apparent differences in the conditioning and both newer variants show differences in the effects of some factors. However, do they hold up when considering the impact of all predictors together in multivariate models?

Now, I report the results from two types of multivariate analysis: tree-based recursive partitioning and mixed-effects regression analysis.

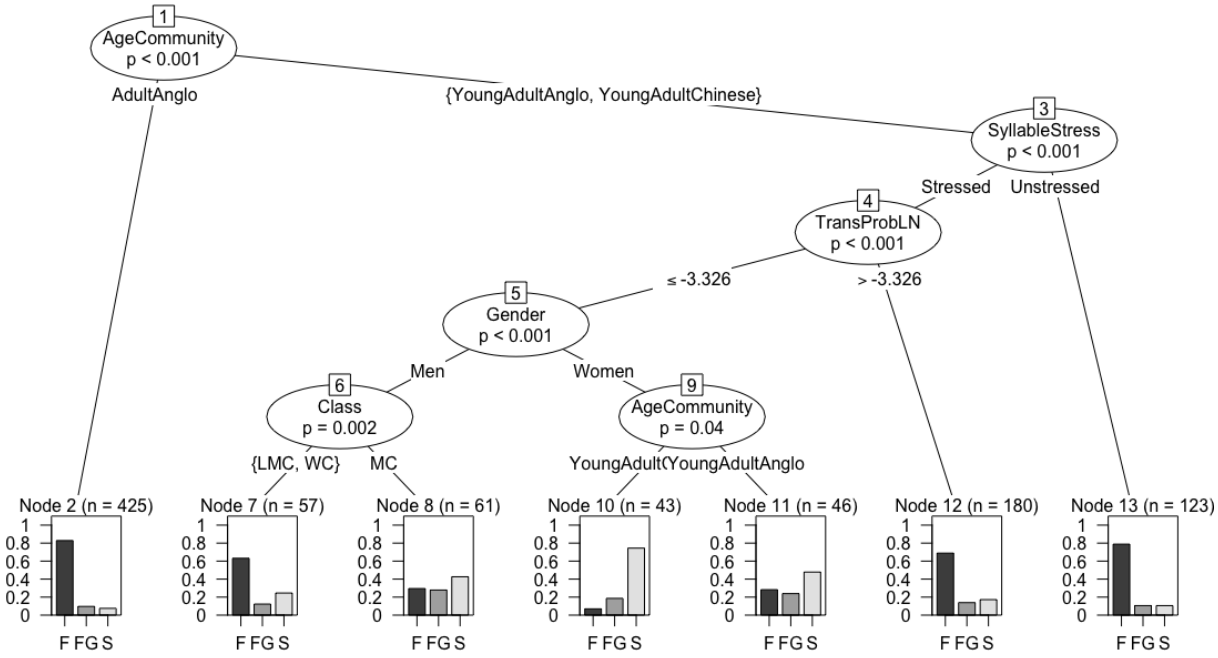
4.5 Recursive partitioning

Recursive partitioning offers the advantage of allowing me to examine all three variants simultaneously. Figure 13 shows a conditional inference tree from the dataset which includes age-community (that is, Adult Anglo, Young Adult Anglo, Young Adult Chinese), gender (men vs. women), class (middle vs. lower middle vs. working), transitional probability (continuous factor), syllable stress (stressed vs. unstressed), and height of following vowel (high vs. mid vs. low)[7]. Its classification accuracy is 73.7 per cent, which is significantly better than the baseline of 68.8 per cent when always choosing the most frequent variant ($p_{binom} < 0.001$).

The result shows that Age-community is the most important factor as it is the first split (Node 1). For the Adult Anglos, non-glottalised FLEECE is the major variant which takes up to 80% of the realisations of *the*+VOWEL while both glottalised FLEECE and schwa are minor variants (as also seen in Figure 6), and neither linguistic nor social factors are at work in conditioning this variation (Node 2). However, the Young Adults are sensitive to the conditioning of a wide range of linguistic and social factors (Nodes 3-13). For the Young Adult Anglos and Chinese, syllable stress is the most important linguistic factor. Unstressed tokens almost categorically favour the conservative variant non-glottalised FLEECE over the newer variants (Nodes 3 & 13) while stressed tokens are subject to further social and linguistic conditioning (Nodes 4-12). When the value of the log-transformed transitional probability is greater than -3.326 (more frequent combinations, e.g., *the other*, *the only*) (Node 4), non-glottalised FLEECE is also strongly favoured (Nodes 12). But with less frequent combinations (the value of the transitional probability is equal to or less than -3.326, e.g., *the Asian, the accent*), women and MC men favour schwa over the other variants (Nodes 4-11). Height of Following Vowel does not emerge from the conditional inference tree to be a significant predictor of the three-way division of the realisations of *the*+VOWEL.

[7] Formula : ctree (Realisation ~ AgeCommunity + Gender + Class + SyllableStress + FollowingVowel + TransProbLN, control = ctree_control (testtype = "MonteCarlo", minbucket = 20, maxdepth = 5)). TransProbLN = Transitional Probability (log-transformed); Realisation here refers to the three main variants: non-glottalised FLEECE, glottalised FLEECE, and schwa.

Figure 13 Conditional inference tree analysis of the realisations of *the*+VOWEL (n = 935).



Notes. F (non-glottalised FLEECE), FG (glottalised FLEECE), S (schwa).

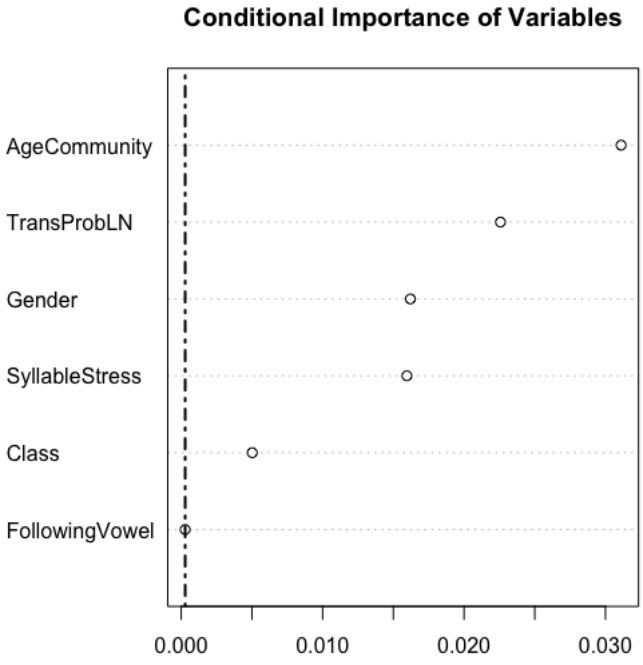
To determine the conditional importance ranking of all these variables in the data, I then ran a random forest analysis. Figure 14 presents the results from a random forest model running with 1,500 trees and with 4 variables sampled at each split (Hothorn, Buehlmann, Dudoit et al., 2006; Strobl, Boulesteix, Zeileis, & Hothorn, 2007; Strobl, Malley, & Tutz, 2009)[8]. Its classification accuracy is 75.5 per cent, which is significantly better than the baseline of 68.8 per cent when always choosing the most frequent variant ($p_{binom} < 0.001$). The C-index for the model is 0.82, indicating that this analysis discriminates well between the variants (Baayen, 2008, p. 204)[9].

[8] The formula is cforest (Realisation ~ AgeCommunity + Gender + Class + SyllableStress + FollowingVowel + TransProbLN, controls=cforest_unbiased(ntree = 1500, mtry = 4). TransProbLN = Transitional Probability (log-transformed); Realisation here refers to the three variants: non-glottalised FLEECE, glottalised FLEECE, and schwa.

[9] If the C-value is 0.5, the predictions are random, while the predictions are perfect if the C-value is 1. A C-value above 0.8 indicates real predictive capacity (Baayen, 2008, p. 204).

Here, the horizontal axis shows the weights of factors while the vertical axis shows the ranking of each factor; the dotted vertical line indicates “the limit at which we can interpret the factors to exert a consistently significant effect across the forest” (Walker, 2021, p. 176). As the random forest is from multiple conditional inference trees, the ranking of the importance of factors may differ from that in any given conditional inference tree (cf., Barth, 2019, p. 160). Here, consistent with the result of the conditional inference tree, Age-community, Transitional Probability, Gender, Syllable Stress, and Class are identified as important factors, so they will be further explored by running mixed-effects regression models to take the variability of individuals and words into account. For Height of Following Vowel, it is not selected as important by the conditional inference tree and its importance score is close to 0 in the random forest. Nevertheless, as demonstrated in the cross-tabulation depicting the distribution between Syllable Stress and Height of Following Vowel in Figure 11, there appears to be a potential interaction between these two factors. To assess the statistical significance of this interaction, it will be incorporated into the mixed-effects regression models detailed below.

Figure 14 Random forest analysis of the realisations of *the*+VOWEL (n = 935).



In summary, the most prominent effect is Age-community where more than 80% of *the*+VOWEL tokens are realised as non-glottalised FLEECE while both glottalised FLEECE and schwa are minor variants for the Adult Anglos. For the Young Adult Anglos and Chinese, the rates of both newer variants are higher, suggesting an apparent time change of more glottalised FLEECE and

schwa in Australian English. For these young adults, the realisations of *the*+VOWEL are susceptible to further social and linguistic conditioning, especially in stressed and less frequent tokens, where women and middle class men use the highest rate of schwa. In terms of the variable importance of these predictors, the random forest analysis reveals that Age-Community is the most important while Following Vowel is the least important. The ranking of the other predictors descends from Transitional Probability to Class, as shown in Figure 14.

The tree-based modelling approach reveals the interactions and the conditional importance of different predictors, but they do not give us a clear picture of the conditioning of the newer variants in relation to the conservative variant. Thus, in order to examine the variation between the conservative and newer variants, I now analyse separately the alternation between glottalised and non-glottalised FLEECE on the one hand, and schwa and non-glottalised FLEECE on the other through mixed-effects logistic regression models.

4.6 Regression analyses

In order to further examine the variation of *the*+VOWEL, I conducted three sets of analyses. The first set aimed to assess the apparent time change of glottalised FLEECE and schwa in *the*+VOWEL, focusing on Anglo Australians from both age groups. The second set aimed to evaluate ethnic differences between Young Adult Anglo Australians and Chinese Australians, concentrating on the Young Adults. Lastly, the third set aimed to assess the ethnic orientation of the Chinese, focusing solely on the Chinese Australians.

For each dataset, I followed the backwards elimination procedure to prune the models with the relevant three-way and two-way interactions included, as specified below. All VIFs scores of the factors in the current models ranged from 1 to 3.9, without any of them being larger than 4, indicating multicollinearity in the data was not a concern (Zuur, Ieno, & Elphick, 2010).

4.6.1 Apparent time: Anglo Adults vs. Young Adults

To examine whether *the*+VOWEL exhibits an apparent time change in Australian English, I compared the Adult Anglo Australians with the Young Adult Anglo Australians. Specifically, as the conditional inference tree showed that there were a three-way interaction between age (Adult vs. Young Adult), syllable stress (Stressed vs. Unstressed), and transitional probability (Low vs. High), and a three-way interaction between age, gender (Men vs. Women), and class (MC vs. LMC vs. WC), these interactions were included in the regression models. Additionally,

the distributions of syllable stress and height of following vowel (Low vs. Mid vs. High) showed an interaction (see Figure 11), so these two linguistic factors were included as an interaction in the regression models. Note that transitional probability was treated as a binary variable (Low: ≤ -3.326 vs. High: > -3.326) instead of a continuous variable in the regression models, based on the split in the conditional inference tree at -3.326. Thus, for the comparison among all the Anglo Australians, I started with a maximal model including two three-way interactions, Age * TransProb * SyllableStress, and Age * Class * Gender, and a two-way interaction, SyllableStress * FollowingVowel to predict the variation between non-glottalised FLEECE and glottalised FLEECE, and between non-glottalised FLEECE and schwa. I pruned it until only significant factors were left, as described above. The regression analyses confirmed the increase in these two new variants in apparent time, with the Young Adult Anglos having a significantly higher rate of each than the Adult Anglos. However, comparisons of the two regression analyses revealed both similarities and differences in the way in which glottalised FLEECE and schwa came into the system.

Table 5 summarises the results of a mixed-effects regression model of the social and linguistic predictors conditioning the variation between glottalised FLEECE and non-glottalised FLEECE[10]. The social factors Age and Gender have significant main effects, and Class shows a marginal main effect (β = -0.87, p = 0.052). Among all linguistic factors included, Transitional Probability is not a significant predictor (as foreshadowed in the descriptive statistics shown in Figure 12) while the interaction effect between Syllable Stress and Height of Following Vowel is significant (as foreshadowed in the descriptive statistics shown in Figure 11). To facilitate the interpretation of these main and interaction effects, they are visualised in Figure 15 and Figure 16 respectively. In each effect plot, the x-axis represents the sub-categories of the predictor, while the y-axis represents the predicted probability of the newer variant glottalised FLEECE.

[10] Formula: glmer(Realisation ~ Gender + Age + Class + SyllableStress * FollowingVowel + (1 | Speaker) + (1 | Word))

Table 5 Model summary for the regression on the realisation of glottalised FLEECE (vs. non-glottalised FLEECE) for Adult and Young Adult Anglo Australians.

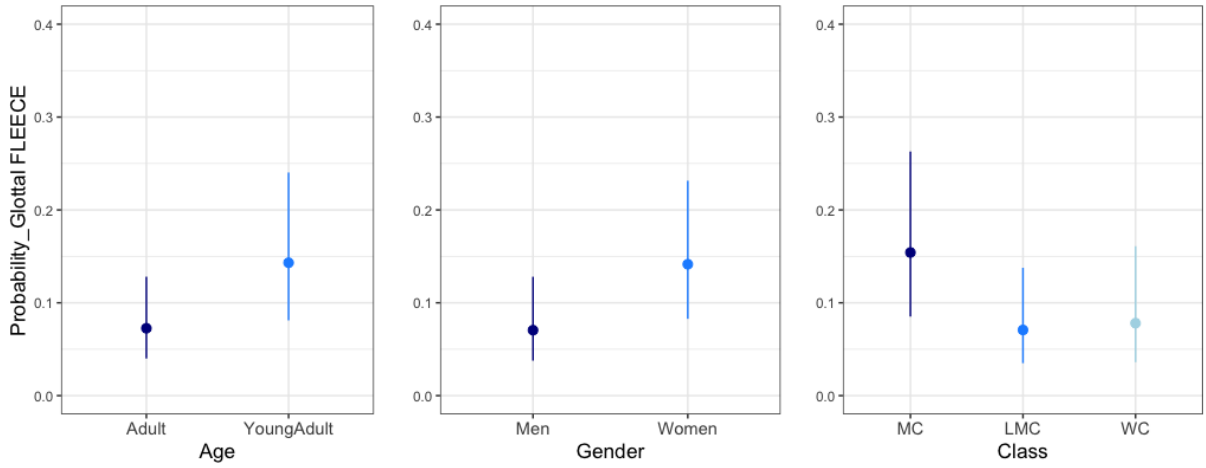
	Estimate	Std. Error	z value	Sig.
Intercept	-2.63	0.52	-5.03	<0.001
Gender$_{\text{Men vs. }\textbf{Women}}$	0.78	0.39	1.99	<0.05
Age$_{\text{Adult vs. }\textbf{Young Adult}}$	0.76	0.39	1.96	<0.05
Class$_{\text{Middle vs. }\textbf{Lower Middle Class}}$	-0.87	0.45	-1.95	0.052
Class$_{\text{Middle vs. }\textbf{Working Class}}$	-0.77	0.48	-1.59	0.111
SyllableStress$_{\text{Stressed vs. }\textbf{Unstressed}}$	0.95	0.61	1.57	0.117
FollowingVowel$_{\text{Low vs. }\textbf{Mid}}$	0.64	0.43	1.51	0.131
FollowingVowel$_{\text{Low vs. }\textbf{High}}$	1.16	0.52	2.25	<0.05
SyllableStress$_{\text{Stressed vs. }\textbf{Unstressed}}$: FollowingVowel$_{\text{Low vs. }\textbf{Mid}}$	-2.30	0.86	-2.69	<0.01
SyllableStress$_{\text{Stressed vs. }\textbf{Unstressed}}$: FollowingVowel$_{\text{Low vs. }\textbf{High}}$	-3.42	0.97	-3.52	<0.001

For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of glottalised FLEECE.

Overall rate of glottalised FLEECE is 14% (89/637). N word type = 121, Word variance = 0.279 (*SD* = 0.528); N Speakers = 53, Speaker variance = 0.777 (*SD* = 0.881); Log likelihood: -226.8; AIC: 477.5; BIC: 531.0. No significant effect for Transitional Probability.

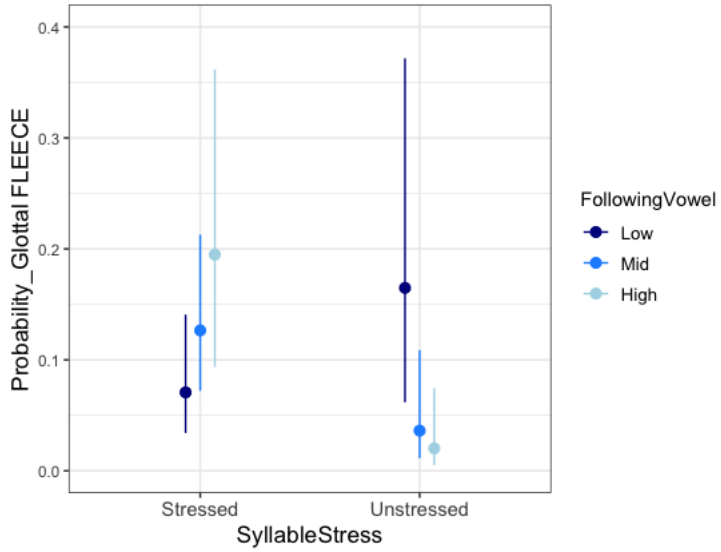
The left panel of Figure 15 shows that compared with Adult Anglos, Young Adult Anglos favour the newer variant (glottalised FLEECE) over the older form (non-glottalised FLEECE), confirming the change in progress I have already described. The mid panel shows that women favour the newer variant glottalised FLEECE over men, and the right panel shows that the middle class speakers favour the newer variant glottalised FLEECE compared to both the lower middle and working class speakers who are not significantly different from each other. The lack of interactions between these social factors indicates that for both age groups, women and middle class speakers favour glottalised over non-glottalised FLEECE, that is, are advancing the change.

Figure 15 Effect plots of Age, Gender, and Class for glottalised FLEECE (vs. non-glottalised FLEECE) for Anglo Australians.



The only significant interaction from the model is between Syllable Stress and Height of Following Vowel. This is visualised in Figure 16, which shows that for the stressed tokens, high vowels (e.g., *eastern, inner, issue*) favour glottalised FLEECE compared to mid and low vowels, while for the unstressed tokens, low vowels (e.g., *idea, afternoon, uncomplicated*) favour glottalised FLEECE compared to mid and high vowels. Thus, the most favourable linguistic contexts for the occurrences of glottalised FLEECE are stressed high vowels and unstressed low vowels, consistent with what was seen in Figure 11.

Figure 16 Effect plot of the interaction between Syllable Stress and Following Vowel for glottalised FLEECE (vs. non-glottalised FLEECE) for Anglo Australians.



Then, following the same protocol, I modelled the conditioning of the variation between schwa and non-glottalised FLEECE for the Anglo Australians. The results are summarised in Table 6[11]. For the social factors included, Gender has a main effect, and Age and Class show a significant interaction effect. Among the linguistic factors, this time, Transitional Probability shows a significant main effect, and Syllable Stress and Height of Following Vowel have a significant interaction effect. To better interpret these effects of social and linguistic factors, they are visualised in Figure 17 and Figure 18 respectively.

Table 6 Model summary for the regression on the realisation of schwa (vs. non-glottalised FLEECE) for Adult and Young Adult Anglo Australians.

	Estimate	Std. Error	z value	Sig.
Intercept	-3.25	0.79	-4.13	<0.001
Age$_{\text{Adult vs. }\textbf{YoungAdult}}$	3.29	0.86	3.82	<0.001
Class$_{\text{Middle vs. }\textbf{Lower Middle Class}}$	1.09	0.83	1.31	0.190
Class$_{\text{Middle vs. }\textbf{Working Class}}$	-0.45	0.98	-0.46	0.648
Gender$_{\text{Men vs. }\textbf{Women}}$	1.31	0.50	2.60	<0.01
SyllableStress$_{\text{Stressed vs. }\textbf{Unstressed}}$	-0.61	0.83	-0.73	0.464
FollowingVowel$_{\text{Low vs. }\textbf{Mid}}$	0.26	0.46	0.57	0.571
FollowingVowel$_{\text{Low vs. }\textbf{High}}$	0.57	0.58	0.98	0.325
TransProb$_{\text{Low vs. }\textbf{High}}$	-1.45	0.50	-2.91	<0.01
Age$_{\text{Adult vs. }\textbf{YoungAdult}}$: Class$_{\text{Middle vs. }\textbf{Lower Middle Class}}$	-2.66	1.14	-2.32	<0.05
Age$_{\text{Adult vs. }\textbf{YoungAdult}}$: Class$_{\text{Middle vs. }\textbf{Working Class}}$	-2.38	1.38	-1.73	0.085
SyllableStress$_{\text{Stressed vs. }\textbf{Unstressed}}$: FollowingVowel$_{\text{Low vs. }\textbf{Mid}}$	-2.40	1.17	-2.06	<0.05
SyllableStress$_{\text{Stressed vs. }\textbf{Unstressed}}$: FollowingVowel$_{\text{Low vs. }\textbf{High}}$	-2.42	1.20	-2.02	<0.05

For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of schwa.

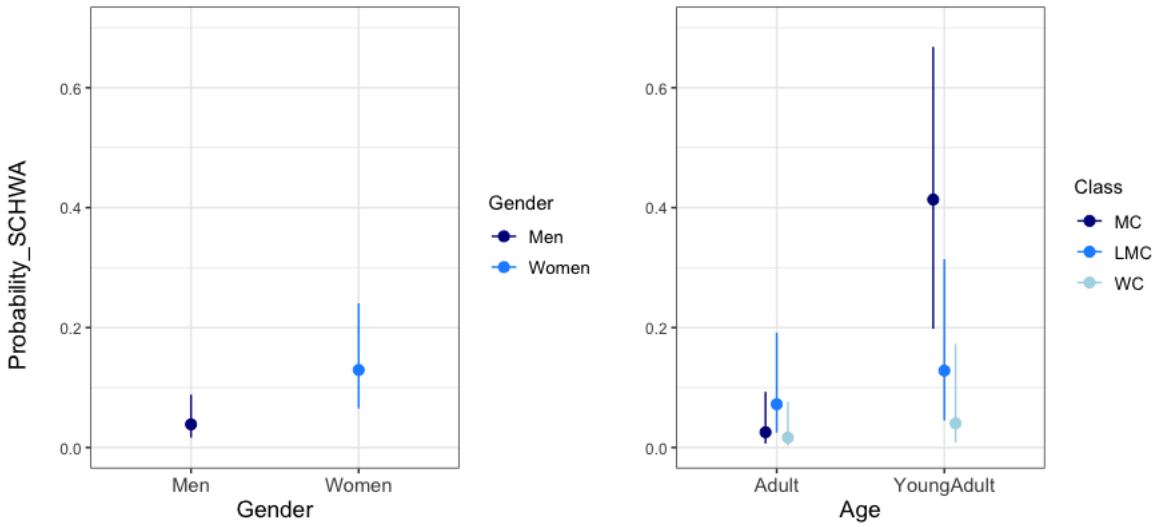
Overall rate of schwa is 15% (95/643). N word type = 124, Word variance = 0.569 (*SD* = 0.755); N speakers = 53, Speaker variance = 1.582 (*SD* = 1.258); Log likelihood: -197.8; AIC: 425.6; BIC: 492.6.

The left panel of Figure 17 shows the main effect of gender, which indicates that women favour schwa over men, similar to the finding for glottalised FLEECE. But unlike glottalised FLEECE, there is a significant interaction effect between Age and Class, as visualised in the right panel

[11] Formula: glmer(Realisation ~ Age * Class + Gender + SyllableStress * FollowingVowel + TransProb + (1 | Speaker) + (1 | Word))

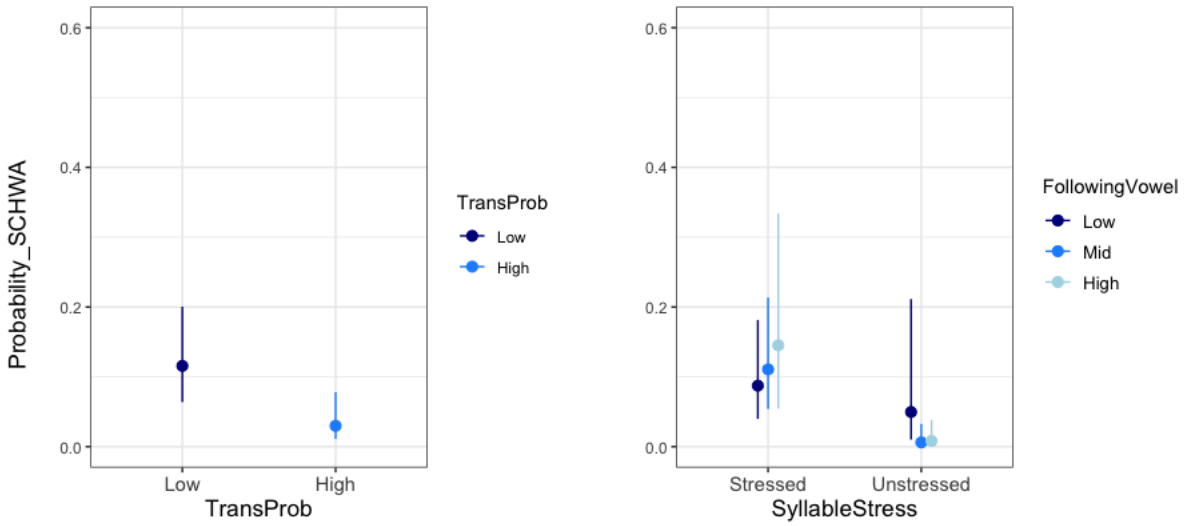
of Figure 17. For Adult Anglos, there is no class effect with all speakers using low rates of schwa, but the class effect emerges for Young Adult Anglos with the middle class speakers favouring schwa over both the lower middle and working class speakers.

Figure 17 Effect plots of Gender and the interaction between Age and Class for schwa (vs. non-glottalised FLEECE) for Anglo Australians.



For the linguistic conditioning, there is a difference from glottalised FLEECE in terms of Transitional Probability, as indicated by the significant main effect shown in the left panel of Figure 18. This effect reveals that when prevocalic *the* and the following word are less likely to co-occur (less frequent combinations), schwa is favoured. This observation aligns with the predictions derived from the descriptive statistics displayed in Figure 12. Hence, Transitional Probability emerges as a robust linguistic factor that distinguishes between these two newer variants. Furthermore, for glottalised FLEECE, there is a significant interaction observed between Syllable Stress and Following Vowel. Similar to the findings for glottalised FLEECE, schwa is preferred when the following words have initial lexical stress compared to those without initial lexical stress, as depicted in the right panel of Figure 18. However, the preference ranking differs. In the case of stressed tokens, high vowels show a preference for schwa over mid and low vowels, indicating that stressed high vowels (e.g., *eastern, east, English*) favour schwa. On the other hand, for unstressed tokens, low vowels exhibit a preference for schwa over mid and high vowels; thus, unstressed low vowels (e.g., *idea, afternoon, ABC*) favour schwa. These patterns align with those find for glottalised FLEECE, indicating that the influence of Syllable Stress and Following Vowel on glottalised FLEECE and schwa is shared.

Figure 18 Effect plots of TransProb and the interaction between Syllable Stress and Following Vowel for schwa (vs. non-glottalised FLEECE) for Anglo Australians.



In summary, we have seen that both newer variants are most favoured by younger speakers, women, the middle class, and with high stressed vowels (e.g., *eastern, inner, English*). But there are also some differences. First, glottalised FLEECE is not subject to the effect of Transitional Probability, while schwa is, with *the*+VOWEL of low transitional probability being more likely to be realised as schwa. And there are also some differences in the social conditioning, in that glottalised FLEECE shows no interaction between age and social class, with the newer variant being favoured by the middle class over both the lower middle and working class for both age groups. For schwa, age is in interaction with social class: there is no class effect observed among the Adults, but the Young Adults exhibit a strong class effect where schwa is predominantly favoured by the middle class. This interaction indicates that class differentiation has had a more recent impact on schwa compared to glottalised FLEECE. Furthermore, the differentiation appears to be more distinct for schwa, as it exhibits a gradual weakening in the favouring effect from the middle to lower middle to working class. In contrast, for glottalised FLEECE, the middle class demonstrates the highest rate, with no significant difference between the lower middle and working class speakers.

The favouring effects of glottalised FLEECE and schwa by younger speakers are consistent with other studies, and the described change in progress for *the*+VOWEL across varieties of English (Hay, Walker, McKenzie, & Nielsen, 2012; Meyerhoff, Birchfild, Ballard et al., 2020; Todaka, 1992). The favouring effects of both newer variants by women align with the findings of Cox, Penney and Palethorpe (2023) in Australian English and Meyerhoff, Birchfild, Ballard et al. (2020) in New Zealand English, but differ from those of MLE where boys favour schwa over

girls (glottalised FLEECE is not examined in that study) (Fox, 2015, p. 167). The class effect, namely, the favouring of both newer variants by the middle class speakers, contrasts with findings in New Zealand, where “non-professionals” favour schwa over “professionals” (although they did not examine glottalised FLEECE) (Hay, Walker, McKenzie, & Nielsen, 2012, p. 29). Thus, the leading role of the middle class speakers, coupled with the gender effect, may be indicative of the social meaning of these newer variants in Australia, and an association with overtly prestigious norms.

Now I will focus on the Young Adults to look at the ethnic differences.

4.6.2 Across ethnicity: Anglo vs. Chinese Young Adults

As we saw above in Figure 6, the Chinese Australians have higher rates of both glottalised FLEECE and schwa than the Adult Anglo Australians, and a higher rate of schwa than their peers, the Young Adult Anglo Australians, while the rate of glottalised FLEECE is the same for both Anglo and Chinese Young Adults. Before drawing the conclusion that the Chinese Australians are at the forefront of the shift towards schwa. We must consider the socioeconomic class patterns observed among the Anglo Australians, taking into account the observation that the working class speakers lagged behind in the change. To address these questions, I now compare the variation of *the*+VOWEL between the Young Adult Chinese and Anglo Australians, excluding all working class speakers from the Anglo Australian sample to make it comparable with the Chinese Australian sample, as there were no working class speakers in this sample. Specifically, I set aside 7 Young Adult working class Anglos from the Young Adult sample, resulting in an exclusion of 67 tokens. Then, I ran regression analyses on the 443 tokens by the 19 remaining Young Adult Anglo and 22 Chinese Australians, making a two-way distinction between middle and lower middle class.

I conducted the same two regression models that were run for the Anglo Australians, comparing glottalised FLEECE and non-glottalised FLEECE, and then schwa and non-glottalised FLEECE. However, this time, I included the variable Community (Anglo vs. Chinese) in the models. I incorporated three two-way interactions between community and three linguistic factors to evaluate whether the variable grammar of *the*+VOWEL is shared between Anglo and Chinese Australians. I also incorporated a three-way interaction between community, gender, and class, and two-way interactions between syllable stress and transitional probability, as well as between syllable stress and height of the following vowel. Hence, the maximal model encompassed two three-way interactions (Community * Gender * Class + Community *

Following Vowel * Syllable Stress) and one two-way interaction (Community * Transitional Probability). Subsequently, I followed a backwards elimination procedure to trim down the models until only significant effects remained, as described above.

The final model predicting the variation between glottalised FLEECE and non-glottalised FLEECE is summarised in Table 7[12]. For glottalised FLEECE, there are no significant effects for Community and Class, neither as main effects nor in interaction with Gender. It is important to note that Community does not show a significant interaction effect with any linguistic factor, suggesting that the variable grammar of glottalised FLEECE (vs. non-glottalised FLEECE) is shared between the Chinese Australians and their Anglo peers. The effects of other social factors exhibit some differences compared to those find for the Anglos in apparent time, as both Gender and Class have significant main effects in that case. Here, Gender is the only social predictor that shows a main effect, and that is of marginal significance (β = 0.90, p = 0.055). Among all the linguistic factors, Transitional Probability does not show a significant effect, but there is an interaction between Following Vowel and Syllable Stress, similar to what has been found for the Anglos in apparent time. To facilitate the interpretation of these main and interaction effects, they are visualised in Figure 19 and Figure 20 respectively.

Table 7 Model summary for the regression on the realisation of glottalised FLEECE (vs. non-glottalised FLEECE) for Young Adult Anglo and Chinese Australians.

	Estimate	Std. Error	z value	Sig.
Intercept	-1.89	0.58	-3.26	<0.01
Gender$_{\text{Men vs. }\mathbf{Women}}$	0.90	0.47	1.92	0.055
SyllableStress$_{\text{Stressed vs. }\mathbf{Unstressed}}$	0.60	0.85	0.71	0.480
FollowingVowel$_{\text{Low vs. }\mathbf{Mid}}$	0.58	0.61	0.95	0.344
FollowingVowel$_{\text{Low vs. }\mathbf{High}}$	2.10	0.81	2.59	<0.01
SyllableStress$_{\text{Stressed vs. }\mathbf{Unstressed}}$: FollowingVowel$_{\text{Low vs. }\mathbf{Mid}}$	-3.67	1.37	-2.68	<0.01
SyllableStress$_{\text{Stressed vs. }\mathbf{Unstressed}}$: FollowingVowel$_{\text{Low vs. }\mathbf{High}}$	-4.50	1.34	-3.36	<0.001

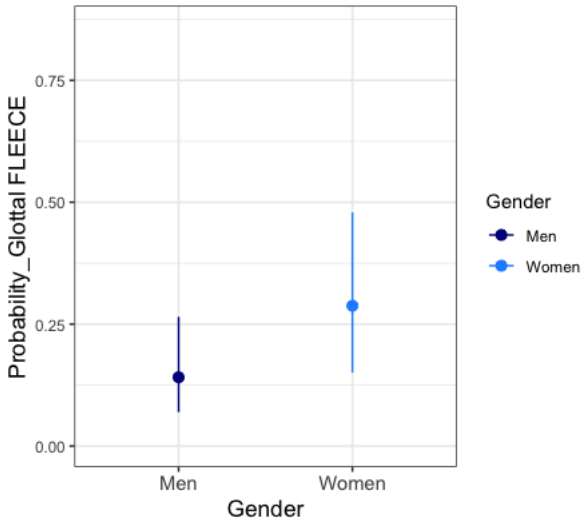
For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of glottalised FLEECE.

[12] Formula: glmer(Realisation ~ Gender + SyllableStress * FollowingVowel + (1 | Speaker) + (1 | Word))

Overall rate of glottalised FLEECE is 24% (73/310). N word type = 86, Word variance = 1.159 (*SD* = 1.077); N speakers = 39[13], Speaker variance = 0.626 (*SD* = 0.791); Log likelihood: -145.3; AIC: 308.5; BIC: 342.2. No significant effects for Community, Class, and Transitional Probability.

As depicted in Figure 19, the marginally significant main effect of Gender indicates that women favour glottalised FLEECE over men, as was also the case for the Anglo Adults seen in Figure 15.

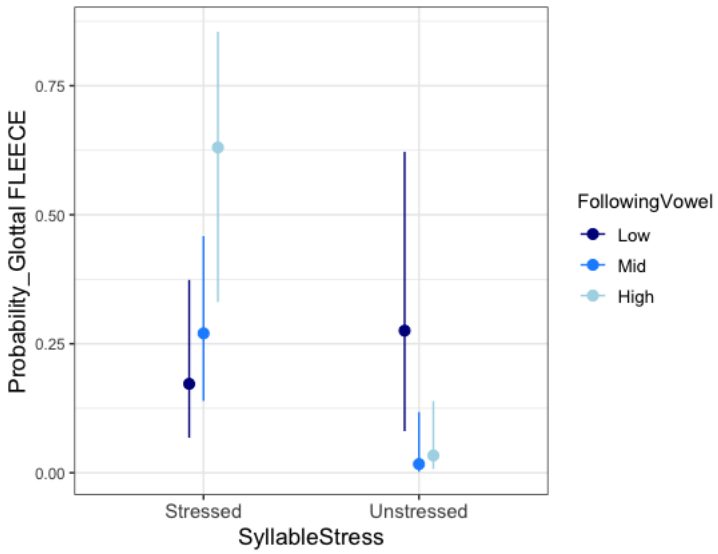
Figure 19 Effect plot of Gender for glottalised FLEECE (vs. non-glottalised FLEECE) for Young Adult Anglo and Chinese Australians.



For the linguistic predictors, as shown in Figure 20, the significant interaction between Syllable Stress and Following Vowel indicates that there is a strong favouring of glottalised FLEECE with high stressed vowels. For the unstressed tokens, low vowels favour glottalised FLEECE compared to mid and high vowels that show the weakest effects on this newer variant. These patterns are similar to those I have reported above for both age groups of Anglo Australians.

[13] 2 speakers from the Young Adult subsample produced no tokens of glottalised FLEECE.

Figure 20 Effect plot of the interaction between Syllable Stress and Following Vowel for glottalised FLEECE (vs. non-glottalised FLEECE) for Young Adult Anglo and Chinese Australians.



I then conducted another regression model to predict the variation between schwa and non-glottalised FLEECE for the Young Adult Anglo and Chinese Australians. The effects of significant predictors in the final model are summarised in Table 8[14]. Again, there is no main effect for Community, but an interaction with Class is evident. There are again no significant interactions between Community and the linguistic predictors, indicating that both groups draw on the same linguistic system in participating in this change of more schwa in *the*+VOWEL context. Gender has a main effect here. When examining the Anglos above, the main effect of Gender has also been found, along with an interaction between Age and Class. Regarding the linguistic predictors, Transitional Probability and Syllable Stress have main effects, while Height of Following Vowel does not show a significant effect, either as a main effect or in interaction with other factors.

[14] Formula: glmer(Realisation ~ Gender + Community * Class + SyllableStress + TransProb + (1 | Speaker) + (1 | Word))

Table 8 Model summary for the regression on the realisation of schwa (vs. non-glottalised FLEECE) for Young Adult Anglo and Chinese Australians.

	Estimate	Std. Error	z value	Sig.
Intercept	0.24	0.66	0.37	0.711
Gender$_{\text{Men vs. }\mathbf{Women}}$	2.11	0.62	3.42	<0.001
Community$_{\text{YoungAdultAnglo vs. }\mathbf{Chinese}}$	-0.26	0.76	-0.34	0.732
Class$_{\text{Middle vs. }\mathbf{Lower\ Middle\ Class}}$	-2.10	0.85	-2.48	<0.05
SyllableStress$_{\text{Stressed vs. }\mathbf{Unstressed}}$	-3.79	0.72	-5.24	<0.001
TransProb$_{\text{Low vs. }\mathbf{High}}$	-1.53	0.70	-2.19	<0.05
Community$_{\text{YoungAdultAnglo vs. }\mathbf{Chinese}}$: Class$_{\text{Middle vs. }\mathbf{Lower\ Middle}}$	2.54	1.17	2.16	<0.05

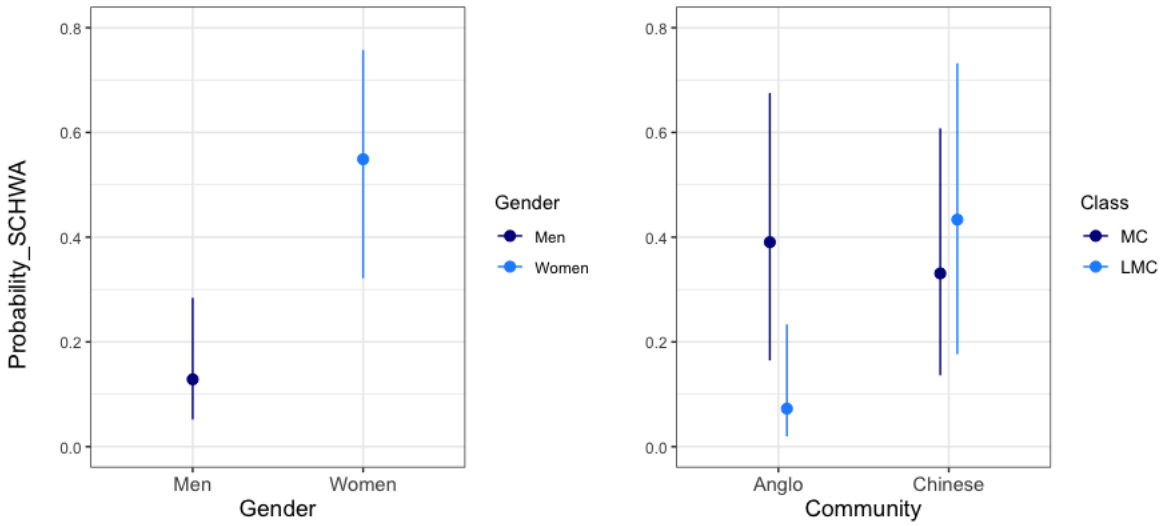
For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of schwa.

Overall rate of schwa is 36% (133/370). N word type = 100, Word variance = 2.153 (*SD* = 1.467); N speakers = 41, Speaker variance = 1.743 (*SD* = 1.320); Log likelihood: -168.6; AIC: 355.2; BIC: 390.4. No significant effect for Height of Following Vowel.

These patterns differ from what has been found for the Anglos in apparent time, as there is an interaction between Syllable Stress and Height of Following Vowel in that case. This implies that the effect might be applicable to both age groups initially, but its strength diminishes over time, leading to its non-significance when focusing solely on the Young Adults. To better interpret these effects of social and linguistic factors, I visualised them in Figure 21 and Figure 22 respectively.

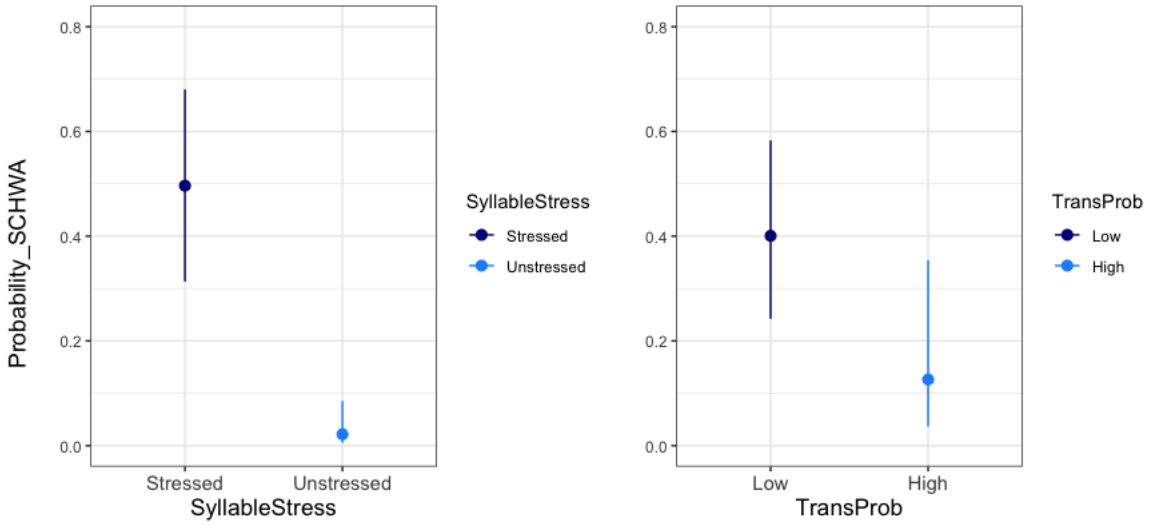
Figure 21 shows the main effect of Gender on the left side and the interaction between Community and Class on the right side. As we can see in the left panel, there is a favouring effect of the newer variant schwa by women, as for the Anglo model above. This holds for both communities, as Gender is not in interaction with Community. For Social Class, as depicted in the right panel, the middle class Young Adult Anglo Australians favour schwa over the lower-middle class speakers, as for the Anglo model above. However, for the Chinese Australians, there is no significant difference between the two social classes (as verified by a pairwise comparison between Chinese LMC and MC by the *emmeans* function in R (Lenth, 2023), *odds ratio* = 0.646, *SD* = 0.509, *p* = 0.579). In the case of the Chinese Australians, both class groups exhibit similar patterns to the middle class Anglo Australians. Thus, it is this distinct class patterning that ultimately contributes to the higher rate of schwa overall among the Chinese Australians.

Figure 21 Effect plots of Gender and the interaction between Community and Class for schwa (vs. non-glottalised FLEECE) for Young Adult Anglo and Chinese Australians.



For linguistic predictors, unlike previous models, there is no significant interaction between Syllable Stress and Vowel Height; rather, there is only a significant main effect of Stress, and Vowel Height does not even have a main effect. As shown in the left panel of Figure 22, the main effect of Syllable Stress indicates a strong favouring of schwa with stressed syllables. Furthermore, Transitional Probability has a main effect, which has been visualised in the right panel, which shows that low transitional probability, representing less frequent combinations of prevocalic *the* and its following word, favours schwa, as observed for the Anglos above.

Figure 22 Effect plots of SyllableStress and TransProb for schwa (vs. non-glottalised FLEECE) for Young Adult Anglo and Chinese Australians.



In summary, these models indicate an apparent time change towards increased usage of the newer variants, schwa and glottalised FLEECE, among younger speakers. Both class groups among Chinese Australians mirror the preferences of their middle class Anglo peers, especially concerning schwa. This inclination suggests Chinese Australians' alignment with middle class norms, signifying a community with a high socioeconomic status in Australia.

4.6.3 Assessing ethnic orientation of the Chinese

We have seen that Chinese Australians are participating in this change in producing higher rates of both glottalised FLEECE and schwa compared to Adult Anglo Australians. Additionally, they demonstrate a higher rate of schwa compared to Young Adult Anglo Australians, but a similar rate of glottalised FLEECE. In the regression models above where ethnicity was treated as a categorical variable, no effect was observed concerning the variation between glottalised FLEECE and non-glottalised FLEECE. However, an interaction between ethnicity and class was found regarding the variation between schwa and non-glottalised FLEECE.

Here, I examine ethnicity further, to consider whether there might be differences among Chinese Australians, according to the measures of ethnic background: ethnic orientation, social network, self-reported Cantonese proficiency, and Cantonese-speaking density in the suburb (cf. Section 3.2). I conducted eight additional independent regression models, focusing separately on glottalised FLEECE and schwa. Each model addressed one of four measures. For comparison with the findings summarised in Section 4.6.2, which considered both Young Adult Anglo and Chinese Australians, I included the significant effects obtained in that section, namely, Class, Gender, Height of Following Vowel, and Transitional Probability.

First, I present the results for glottalised FLEECE, which indicate that none of the ethnic background measures have any significant effects. Moreover, the effects of Class, Gender, Height of Following Vowel, and Transitional Probability are also found to be non-significant. Consequently, all four regression models for glottalised FLEECE converge to the same final model after removing these non-significant effects. In each model, the only significant effect observed is Syllable Stress, as summarised in Table 9.

Table 9 Model summary for the regression on the realisation of glottalised FLEECE (vs. non-glottalised FLEECE) for Chinese Australians.

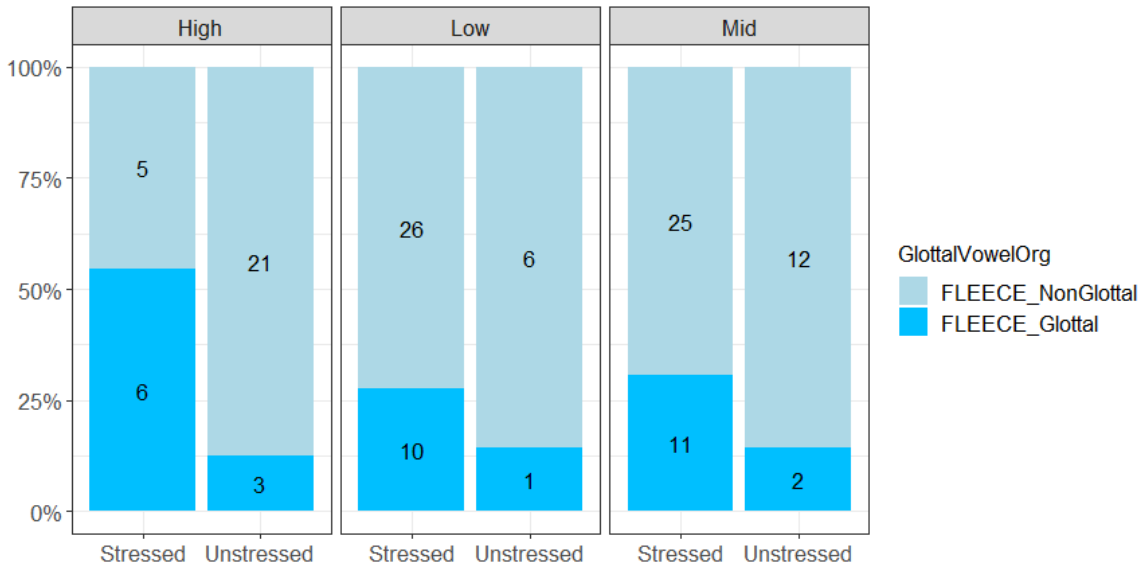
	Estimate	Std. Error	z value	Sig.
Intercept	-0.68	0.38	-1.80	0.071
SyllableStress Stressed vs. **Unstressed**	-1.83	0.71	-2.59	<0.01

For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of glottalised FLEECE.

Overall rate of glottalised FLEECE is 26% (33/128). N word type = 44, Word variance = 0.741 (*SD* = 0.861); N speakers = 20, Speaker variance = 0.335 (*SD* = 0.579); Log likelihood: -67.1; AIC: 142.1; BIC: 153.5. No significant effects for Class, Gender, EOI, Social Network, Cantonese Proficiency, Cantonese-speaking Density in the Suburb, Height of Following Vowel, and Transitional Probability.

Similar to the observations detailed in Table 7, where the model encompassed both Young Adult Anglo and Chinese Australians, here stressed syllables exhibit a preference for glottalised FLEECE. However, it is important to highlight an interaction between Syllable Stress and Following Vowel that has been found above, as depicted in Figure 20, wherein stressed syllables favour glottalised FLEECE, especially with high following vowels. The absence of a significant effect of Following Vowel here might be attributed to the insufficient number of tokens available for the Chinese dataset. Specifically, there are only a total of 33 tokens of glottalised FLEECE for the Chinese. This distribution can partially account for the lack of significance found in the regression models concerning measures of ethnic background, so I will reassess these measures using alternative methods in Chapter 7. Here, to gain a clearer understanding of the relationship between Syllable Stress and Following Vowel, I have visualised their cross-tabulation in Figure 23. This visualisation shows that, for the Chinese dataset, stressed high vowels exhibit the highest rate of glottalised FLEECE, mirroring the observations from Figure 20 above. These consistent patterns reinforce the earlier findings, indicating a shared linguistic conditioning of this variable between Young Adult Anglos and Chinese.

Figure 23 Cross-tabulation of the SyllableStress and FollowingVowel distribution for glottalised FLEECE (vs. non-glottalised FLEECE) for Chinese Australians.



Next, I present the findings for the schwa (vs. non-glottalised FLEECE) model for the Chinese dataset. The conclusive model for all models, after analysing all predictors, demonstrates significant main effects of Gender, Syllable Stress, and Transitional Probability, as outlined in Table 10. Once more, none of the ethnic background measures demonstrate any significant effects, indicating minimal evidence of ethnic markers in the English spoken by Chinese Australians. This observation aligns with the findings identified in the glottalised FLEECE model discussed earlier. Furthermore, the class effect for the Chinese is not significant. This observation aligns with our earlier observation depicted in Figure 21, indicating a class effect solely between LMC and MC for the Young Adult Anglos. However, for the Chinese, these two class groups demonstrate a similar pattern. Regarding linguistic conditioning for the Chinese, akin to results in the schwa model for both Anglo and Chinese Young Adults, no effect is observed for Following Vowel.

Table 10 Model summary for the regression on the realisation of schwa (vs. non-glottalised FLEECE) for Chinese Australians.

	Estimate	Std. Error	z value	Sig.
Intercept	0.09	0.66	0.13	0.897
Gender$_{\text{Men vs. }\textbf{Women}}$	2.90	1.00	2.90	<0.01
SyllableStress$_{\text{Stressed vs. }\textbf{Unstressed}}$	-4.49	1.09	-4.12	<0.001
TransProb$_{\text{Low vs. }\textbf{High}}$	-2.32	0.86	-2.68	<0.01

For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of schwa.

Overall rate of schwa is 44% (75/170). N word type = 60, Word variance = 1.278 (*SD* = 1.130); N speakers = 22, Speaker variance = 2.182 (*SD* = 1.477); Log likelihood: -72.8; AIC: 157.7; BIC: 176.5. No significant effects for Class, EOI, Social Network, Cantonese Proficiency, Cantonese-speaking Density in the Suburb, and Height of Following Vowel.

The results here show that much like the observations in the schwa model for both Anglo and Chinese young adults, Chinese women here tend to favour schwa over men, stressed syllables exhibit a preference for schwa over unstressed syllables, and low transitional probability favour schwa over high transitional probability. These trends align with the earlier findings presented in Table 8, indicating that Chinese women are driving the shift towards more schwa, and the variable grammar is consistent among both Anglo and Chinese Young Adults.

In summary, the findings presented in this section reaffirm the observations made in Section 4.6.2. Firstly, there is no class differentiation among the Chinese concerning both glottalised FLEECE and schwa. Secondly, the gender effect is more pronounced in schwa, indicating that women are leading the shift towards more usage of schwa. Thirdly, the variable grammar remains consistent between Anglo and Chinese Young Adults, where stressed syllables favour both glottalised FLEECE and schwa, while only schwa is influenced by transitional probability, specifically favouring it in cases of low transitional probability.

None of the four measures related to the ethnic background of the Chinese exhibit significant effects in the regression models for either glottalised FLEECE or schwa. Thus, I will re-examine these measures using different methods in Chapter 7.

4.7 Comparing linguistic conditioning across glottalised FLEECE and schwa

In terms of linguistic conditioning, the conditional inference tree analysis reveals the effects of syllable stress and transitional probability when examining all three variants simultaneously. The effects of these two factors are further confirmed in the subsequent regression models, alongside height of the following vowel, which have different impacts on schwa and glottalised FLEECE. These effects hold consistently across both the Chinese and Anglo Australian communities, indicating that the variable grammar of *the*+VOWEL is shared between these two groups. Specifically, a significant interaction effect is observed between syllable stress and the height of the following vowel for glottalised FLEECE, indicating a preference for this newer variant with high stressed vowels. However, for schwa, there is no interaction effect between the height of the following vowel and syllable stress, nor a main effect of the height of the following vowel, suggesting a preference for schwa with stressed tokens only. Furthermore, a higher rate of schwa is associated with less frequent *the*+VOWEL combinations.

A further point to note is that there is a difference in the linguistic conditioning of the two newer variants, in that only schwa is susceptible to the frequency effect. In less frequent *the*+VOWEL combinations, there is a higher probability of schwa, but the same effect is not seen with glottalised FLEECE. For instance, the vowel realisation of *the* in the most frequent combination, *the other* (9% schwa, 11/126), shows more resistance to analogical change towards schwa compared to a less frequent combination like *the accent* (91% schwa, 10/11). The definite article *the* occurs more frequently before consonants in speech, where the use of schwa is nearly categorical compared to FLEECE (Fox-Tree & Clark, 1997, p. 154). In cases of analogical change, less frequent forms are typically targeted first because they are less firmly established in memory due to less robust stored representations (Bybee, 1985, p. 124). Hence, due to the analogy to the frequent use of schwa in the preconsonantal environment, schwa is more likely to be employed with less frequent *the*+VOWEL combinations (cf. Hay, Walker, McKenzie and Nielsen (2012, p. 31)).

The reason why glottalised FLEECE is not subject to the same frequency effect may be because a similar kind of analogy does not apply. Instead, there seems to be a more entrenched and conventionalised usage of FLEECE in the prevocalic environment. This pattern may persist regardless of whether FLEECE is glottalised or not, as FLEECE occurs before vowels more frequently than in the preconsonantal environment 14 times (Jurafsky, Bell, Fosler-Lussiery et

al., 1998, p. 3). Another explanation is the high “degree of relatedness” between the two FLEECE variants (Bybee, 1985, pp. 58, 118). In comparison to schwa, glottalised FLEECE is more closely aligned with the representation of the majority variant in vowel quality, non-glottalised FLEECE. Thus, the mental storage and actual usage of both FLEECE variants share the phonological structure of the FLEECE vowel, leaving little room for analogical change to occur.

The effect of height of the following vowel has yielded contradictory findings in previous studies. In both American English and New Zealand English, it has been found that high vowels favour schwa, which has been interpreted as a dissimilatory process to avoid the co-occurrence of two high vowels in *the*+VOWEL contexts (Gaskell, Cox, Foley et al., 2003, p. 722; Meyerhoff, Birchfild, Ballard et al., 2020, p. 76). Additionally, glottalisation has been frequently observed with high vowels in American English (Todaka, 1992, p. 46). In contrast to this, in Australian English, comparing across one word with a low vowel (*uncontrollable*) and another with a high vowel (*airfield/aerodrome*), Cox, Penney and Palethorpe (2023, p. 822) found that schwa was favoured with the low vowel, and proposed assimilation to account for this. Nevertheless, none of these studies have considered the interaction between syllable stress and vowel height, which may account for these inconsistencies. Here, I have shown that both high stressed vowels and low unstressed vowels show a preference for the newer variants, indicating the significance of the interplay between stress and the quality of the following vowel in the realisations of *the*+VOWEL.

4.8 Discussion and conclusion

The analysis of *the*+VOWEL in spontaneous speech of Australian English reveals an ongoing shift away from non-glottalised FLEECE and an increase in two newer variants, glottalised FLEECE and schwa. These changes are primarily led by young women and middle class speakers, suggesting that these newer variants are associated with overtly prestigious norms in Australia. Aligning with previous studies that have suggested that ethnic minorities or individuals residing in ethnically diverse neighbourhoods play a leading role in this change (Cheshire, Kerswill, Fox, & Torgersen, 2011; Cox, Penney, & Palethorpe, 2023; Meyerhoff, Birchfild, Ballard et al., 2020), here, the Chinese Australians have a higher rate of schwa compared to the Anglo Australians. However, both groups show similar rates of glottalised FLEECE. Thus, if the Chinese are leading, this is only the case for one of the two incoming variants. Furthermore, despite the Chinese Australians having a higher rate of schwa, the linguistic conditioning of *the*+VOWEL remains largely shared between Anglo and Chinese

Australians, as there is no effect of community, either as a main effect or in interaction with other linguistic factors.

In prior work, ethnicity has been considered independently of other social factors. But here, by comparing across ethnicity and social class, I find that there are interactions between them (see similar findings in Qiao & Travis, 2022 regarding Anglo, Chinese, and Italian Australians). This finding aligns with prior sociophonetic studies carried out by the Sydney Speaks team on these communities (Grama, Travis, & Gonzalez, 2020, 2021; Sheard & Qiao, 2021; Travis, Grama, & Purser, 2023; Travis & Torres Cacoullos, 2023). Though the intersectionality between ethnicity and social class has been widely referred to (e.g., Eckert, 2008), this finding demonstrates how taking account of this changes our interpretation of the ethnic differences observed. Thus, "patterns of ethnic variation must be studied in relation to variation and change in the broader community, as ethnicity cannot be considered independently from other social factors" (Grama, Travis, & Gonzalez, 2021, p. 310).

There may be a possibility that the speech of Chinese Australians is influenced by language transfer from their heritage language, Cantonese, or exposure to Hong Kong English. However, additional research is necessary to further investigate this possibility. I am not able to test this for this variable as I do not have access to the audio recording of this variety, though I will do so in the subsequent chapters for non-phonetic features, using the ICE-HK corpus.

Though ethnic orientation has been widely examined in relation to ethnic variation in previous studies (e.g., Clothier, Fletcher, & Loakes, 2018; Hoffman & Walker, 2010; Zhang, 2015), none of the four measures assessing the ethnic background of the Chinese considered here emerge as significant in the regression models, as reported in Section 4.6.3. For this variable, the Chinese Australians considered here pattern similarly regarding their orientation to Chinese heritage, culture, and lifestyle. This will be considered further in Chapter 7, where I will re-evaluate ethnic orientation using alternative statistical methods.

The subsequent chapters move away from sociophonetics to consider two morphosyntactic variables, the future temporal reference system and *there's* + plural argument. These variables in Australian English have received limited study thus far, so I need to situate the Chinese Australians in relation to the timing of change of them. And for these two variables, I am able to explore the potential substrate transfer effect in the English of Chinese Australians by conducting comparisons with the ICE-HK corpus. Thus, the following analyses will examine

patterns of variation in the Sydney Speaks data and compare them with data from Hong Kong English obtained from the ICE-HK corpus.

Chapter 5 Future Temporal Reference

5.1 Introduction

5.1.1 Future temporal reference in English

The English future temporal reference system is a domain that shows a high degree of variability in expression, which includes modals *will* (as in (10)), as well as *shall*; periphrastic verbal constructions *be going to* (as in (11)) and *be about to*; simple present forms (as in (12)); and present progressive forms (as in (13)) (Comrie, 1976, p. 10; cf., Denis & Tagliamonte, 2018; Leech, 2004; Torres Cacoullos & Walker, 2009).

Variable use of future temporal reference in English

(10)
*I think it **will change** with our generation.*

[SydS_CYM_072_Lathan]

(11)
But I'm going to change that.

[SydS_AYM_021_Matthew]

(12)
*I don't know if she **plans to go** again this year.*

[SydS_AYM_013_Tony]

(13)
*My birthday'**s coming up** at the end of the month.*

[SydS_AYF_038_Amelia]

In Variationist Sociolinguistics, most studies have limited the variants of the English future temporal reference system to the variation between *be going to* and *will* (and their reduced forms *gonna, 'll, won't*) (e.g., Denis & Tagliamonte, 2018; Fehringer & Corrigan, 2015; Tagliamonte, Durham, & Smith, 2014), as these are the most frequent variants occurring in speech data (e.g., out of 3,337 tokens of future temporal reference, 84% were either *be going to* or *will* in Quebec English (Torres Cacoullos & Walker, 2009, p. 328)). *Shall* and *be about to* do not occur or are very rare (e.g., only 5 tokens of *shall* were found in a Toronto English

corpus of approximately 3 million words, compared with 1,260 tokens of *will* and 1,039 tokens of *be going to* (Denis & Tagliamonte, 2018, p. 405)). And simple present and present progressive forms of future temporal reference in English show distinct semantic connotations compared with *be going to* and *will* (Copley, 2009, pp. 15-16; Huddleston & Pullum, 2002, pp. 131-133; Visser, 1963/1973) and are heavily constrained by grammatical contexts, where, for example, they tend to co-occur with a temporal adverbial that explicitly refers to the future (Biber, Johansson, Leech et al., 1999, p. 455; cf., Torres Cacoullos & Walker, 2009).

It has been noted that *be going to* and *will* reflect two grammaticalisation trajectories – one movement-verb-oriented (*be going to*) and the other volition-oriented (*will*) (Bybee, Perkins, & Pagliuca, 1994, pp. 254-272). *Will* derived historically from a verb of desire, *willan* 'to wish/want' in Old English, which then developed the meaning of willingness and intention as a modal verb between Old English and Middle English, and then came to function as a marker of futurity from the fifteenth to sixteenth centuries via grammaticalisation (Hopper & Traugott, 2003, pp. 46, 97-98). As for *be going to*, its original meaning was movement, and then, through specialisation, it developed the meaning of prediction (Hopper & Traugott, 2003, p. 3). Because of the different evolutionary trajectories of *be going to* and *will*, it has been argued that *will* is a plain indication of future that expresses "mild" or "general" prediction while *be going to* has a stronger focus on "matrix time", that is, "the time when the utterance is supposed to be valid", and thus it is said that *be going to* "often implies plans underway" (Bergs, 2010, p. 218; see also Nicolle, 1997).

As an alternative to this proposed semantic difference, a stylistic difference has been proposed, namely that *be going to* is the "informal alternative" to *will* (Mair, 1997, p. 1538; Palmer, 1987, p. 148; Quirk, Greenbaum, Leech, & Svartvik, 1985, p. 214), as *will* is associated more with writing and formal texts (Palmer, 1990, p. 142; Wekker, 1976, p. 124). This is supported by quantitative studies (Engel & Szmrecsanyi, 2023; Szmrecsanyi & Engel, 2023). For example, Berglund (2000, pp. 33-35) compared future temporal reference in written and spoken corpora of British English. This study found that *will* was used much more than *be going to* in a more formal written genre, the "informative text" (88% *be going to* vs 3% *will*) and that it was used less in the spoken corpora (23% *be going to* vs. 72% *will*, with the remainder in both cases being accounted for by *shall*). Similarly, Tagliamonte and Denis (2008, pp. 20-22) reported that Canadian teenagers use a higher rate of *be going to* in spoken conversations (43%) than in written instant messaging (35%). Thus, *will* is more frequently used in writing and is associated with formality (Engel & Szmrecsanyi, 2023, p. 359).

Future temporal reference is an interesting variable to examine in the Australian context, as it has not been studied in Australian English. In other varieties of English, the linguistic conditioning of this variable has been widely researched, providing a solid foundation for its examination in Australian English. In terms of social conditioning, comparisons across age groups suggest that the change to *be going to* is ongoing in the UK, but not in North America. There has been little examination of other social effects, such as gender and social class, and some indication of ethnic differences in comparisons between African American and other Canadians (Poplack & Tagliamonte, 1999). This prompts the question: Will similar ethnic differences be observable in Australian English, particularly when comparing the speech of Chinese Australians and Anglo Australians? Furthermore, in the context of Chinese Australians of a Cantonese speaking background, might there be language transfer from Cantonese? For this variable, I am able to compare the patterns in the ICE-Hong Kong data, providing an indication of how language transfer may manifest, something that was not possible for *the*+VOWEL, as the audio of ICE-HK is unavailable.

5.1.2 Assessing substrate transfer: future temporal reference in Cantonese

In Cantonese, future temporal reference is not an obligatory grammatical category, but is variably expressed by adverbs (such as *dousìh* 'by that time' (14), *gānjyuh* 'next' (15), *yāt-jahn-gāan* 'in a moment' (16)), auxiliary *wúih* 'will/would' (17), or not at all as in example (18) (Matthews & Yip, 2011, p. 217). In contrast, English has a grammaticalised and obligatory system for expressing temporal reference, though there is variability in the forms used to express it. Consequently, there are noteworthy typological distinctions in how future temporal reference is conveyed between Cantonese and English (cf., Tse, Li, & Leung, 2012).

(14)

到時 *我哋 就 知道 點 嘅 嘞*

Dousìh ngóhdeih jauh jīdou dím ge lak
'We (will) know how it is by then.'

(15)

我哋 ***跟住*** *講 第二 個 題目*

Ngóhdeih **gānjyuh** góng daih-yih go tàihmuhk
'Next we (will) talk about another topic.'

(16)

*佢哋　　**一陣間**　　去　送機*

Kéuihdeih **yātjahngāan** heui sung-gēi
‘In a moment they (are going to) see someone off (at the airport).’

(17)

*我　**會**　好　掛住　你　嘅*

Ngóh **wúih** hóu gwa-jyuh léih ge
‘I will miss you a lot.’

(18)

佢哋　　有　排　都　未　結得婚 (p. 222)

Kéuihdeih yáuh pàaih dōu meih git-dāk-fān
‘It (will be) a while before they can get married.’

These typological differences allow predictions about how language transfer may be manifested to be made. First, we might predict a differential effect for adverbs, due to the predominant use of adverbs to mark future temporal reference in Cantonese, and second, we might predict a higher rate of use of *will*, as Cantonese frequently employs the auxiliary *wúih*, which shares semantic and syntactic similarities with *will*. If language transfer plays a role in the patterning of future temporal reference, then this should be observed in the ICE-HK corpus with speakers who have Cantonese as their first language, and this thus provides a comparison for the Chinese Australians.

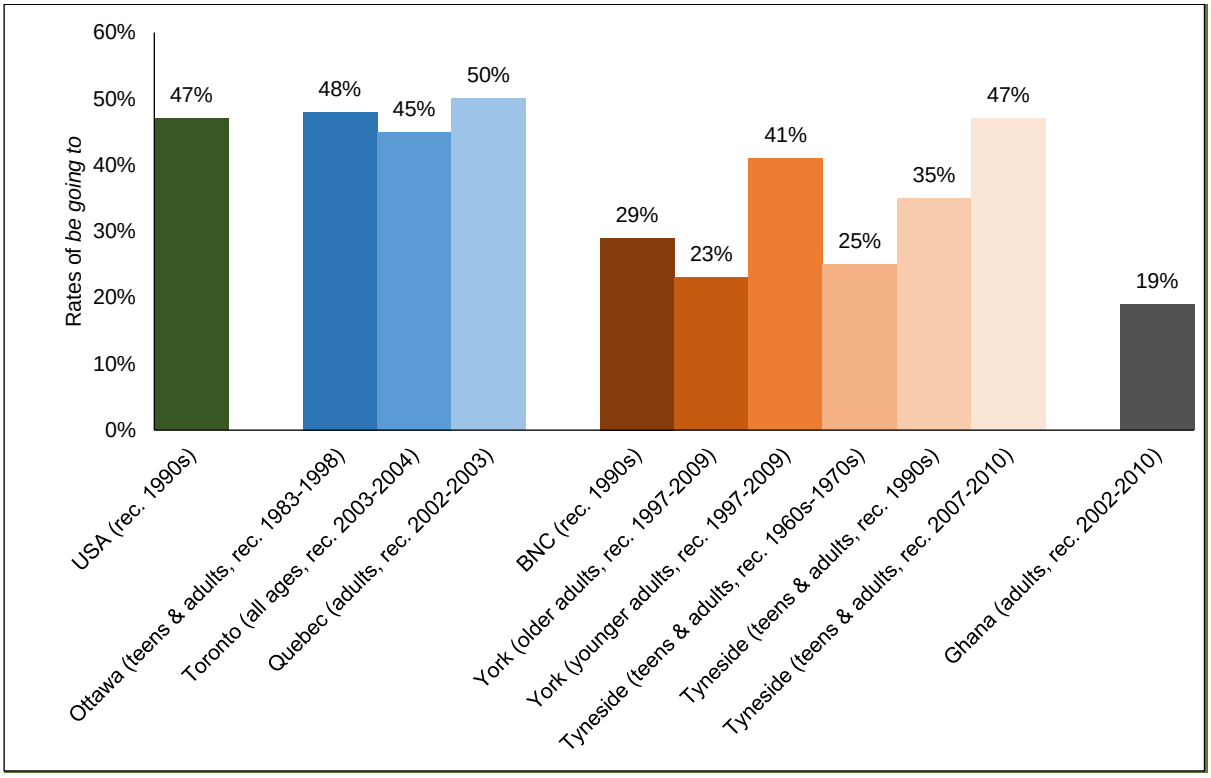
5.2 Literature review

5.2.1 Timing of the change of future temporal reference across varieties of English

To contextualise the rates of *be going to* (vs. will) in Australian and Hong Kong English, I will first consider rates across other varieties, based on a wide body of literature on this variation. Figure 24 shows the rates of *be going to* versus *will* at different time points in four different varieties of English, namely, American English, Canadian English, British English, and Ghanaian English, taken from different studies (see notes following figure). The horizontal axis

represents the specific name of the corpus or variety, along with the year(s) of recording, and the vertical axis shows the rate of *be going to* relative to *will*.

Figure 24 Rates of *be going to* vs. *will* of future temporal reference across varieties of English.



Notes: USA (Szmrecsanyi, 2003, p. 302); Canada: Toronto (Tagliamonte & D'Arcy, 2009, p. 90), Ottawa (Poplack & Tagliamonte, 1999, p. 333), Quebec (Torres Cacoullos & Walker, 2009, p. 327); Britain: British National Corpus (BNC) (Szmrecsanyi, 2003, p. 302), York (Tagliamonte, Durham, & Smith, 2014, p. 84), Tyneside (Fehringer & Corrigan, 2015, p. 209); Ghana (Schneider, 2016, p. 151).

As can be seen, the overall rates of *be going to* in North American varieties of English are higher than those of British English and Ghanaian English, and are relatively stable over time. Specifically, in American English, Szmrecsanyi (2003, p. 302) observed a rate of 47% (234/493) *be going to* based on the Santa Barbara Corpus of Spoken American English, from which he analysed data recorded in the 1990s, with fourteen conversations with fifty-one speakers of American English (Du Bois, Chafe, Meyer et al., 2000-2005).

In Canadian English, the rates of *be going to* are similar across regions, ranging from 45% to 50%, despite the fact that the data was collected at different time points. The data from Ottawa were sociolinguistic interviews conducted between 1983 and 1998 with teenagers and adults

(with an age range of 17-89) (Poplack & Tagliamonte, 1999, p. 339) (see Poplack, 2017 for more details of the corpus); the data from Toronto were recorded some 20 years later (between 2003 and 2004) and encompassed a wider age range, from 9 to 92 years old (Tagliamonte & D'Arcy, 2009, p. 72); and the data from Quebec were recorded around that same time through sociolinguistic interviews with seventy-four speakers with an age range of 18-75+ (recorded between 2002 and 2003) (Torres Cacoullos & Walker, 2009, p. 327) (see Poplack, Walker, & Malcolmson, 2006 for more details of the corpus). Notably, the varieties of North American English exhibit similar rates of *be going to*, suggesting that this change has advanced to completion in these varieties (Tagliamonte & D'Arcy, 2009, p. 90).

In the UK, the usage rates of *be going to* are lower, ranging from 23% in York to 47% in Tyneside. A study analysing the British National Corpus, recorded in the 1990s, reported a rate of *be going to* of 29% (22,454/78,684) (Szmrecsanyi, 2003, p. 302). Studies examining regional varieties of British English (York and Tyneside) have revealed an ongoing change. For instance, in a corpus of York English (Northern England) made up of sociolinguistic interviews conducted from 1997 to 2009, adults aged 31 and above used *be going to* at a rate of 23% (126/556), which increased for young adults under the age of 31 to 41% (178/433) (Tagliamonte, Durham, & Smith, 2014, p. 84). In a real-time study in Tyneside English (North East England), based on sociolinguistic interviews conducted at three time points, 1960s-1970s, 1990s, and 2007-2010 (with speakers of different ages) found a rate of *be going to* of 25% (61/242) in the 1960s-1970s, to 35% (330/936) in the 1990s, and 47% (174/372) (Fehringer & Corrigan, 2015, p. 209). Thus, these results "show a clear progression throughout the different time periods" in the use of *be going to* (Fehringer & Corrigan, 2015, p. 218).

The lowest rate of *be going to* is observed in Ghana, where it stands at 19% (123/660) (Schneider, 2016, p. 151). This study was based on data collected from 60 private face-to-face conversations conducted between 2002 and 2010, involving 133 speakers, 80% of whom were university students in their early or mid-20s, leading to the characterisation of this dataset as "English as spoken by young, educated Ghanaians" (Schneider, 2016, pp. 145-146).

In summary, there is considerable variability among English varieties regarding the timing of the change in future temporal reference. North American English varieties do not appear to exhibit an ongoing change in this regard, while in British English varieties, there is a noticeable increase in the use of *be going to* in newer data and among younger speakers.

Future temporal reference has not been examined in Australian English, thus, unlike for *the*+VOWEL, which is a recent change, it is unknown whether future temporal reference is still undergoing change in this variety. Therefore, I first need to assess the change and then consider the role of Chinese Australians in this change.

5.2.2 Social conditioning: gender, class and ethnicity

Though the timing of change of future temporal reference shows cross-variety differences, social factors have received minimal attention. As far as I am aware, there is only one study that examines ethnicity; only one that examines gender; and none that consider social class.

The effects of ethnicity have been examined in Canada by Poplack and Tagliamonte (1999). In their study, two varieties of African American English (AAE), one from a relatively isolated African American community described as an "enclave variety" (Poplack & Tagliamonte, 1999, p. 336), and the other from a rural African American community, were compared to an urban variety of North American English spoken by Anglophone residents of Ottawa. The results showed that the rate of *be going to* in the enclave variety of AAE is similar to that in Ottawa, at 53% (1,129/2,113) and 48% (145/302) respectively. However, these rates are higher than the rate observed in the rural variety of AAE, which is at 31% (62/199) (p. 333). Furthermore, the analysis of the linguistic conditioning of the variants suggests some differences between all three varieties, especially in the effect of proximity, indicating that the variable grammar is not shared across the different communities (p. 333). Thus, this study found that ethnic variation is evident not only in rates of use but also in the variable grammar used by different ethnic communities (p. 338).

The only study that has incorporated gender reported no significant difference between men and women, with women using *be going to* at a rate of 46% and men at 44%, leading to the conclusion that the change in future temporal reference is at a late stage where "meaningful male/female differences have levelled" in Canada (Tagliamonte & D'Arcy, 2009, p. 90).

5.2.3 Linguistic conditioning

The linguistic conditioning of future temporal reference has been extensively explored in previous studies across various English varieties, and the findings are notably consistent among these studies. The primary linguistic factors that have been investigated include sentence type, clause type, polarity, grammatical person of subject, temporal adverbials, and temporal proximity.

Sentence type has been found to have a strong effect on the realisation of future temporal reference. Questions tend to favour the use of *be going to*, while declarative sentences tend to favour *will* across various varieties of English (Tagliamonte, Durham, & Smith, 2014, p. 102; Torres Cacoullos & Walker, 2009, p. 343). Another important implication is clause type and a consistent finding is that *be going to*, as a newer variant, is preferred in subordinate clauses (Denis & Tagliamonte, 2018, p. 414; Poplack & Tagliamonte, 1999, p. 334; Szmrecsanyi, 2003, p. 306). Even though there is a theoretical argument that main clauses are more robust in fostering grammatical innovation than subordinate clauses (see Bybee, 2001; cf., Heine, 2003, p. 586), this would be expected to be observed at an early stage of grammaticalisation and not in the present case of the future temporal reference in a modern English variety. Prior research also found that apodoses (*if*-conditionals) strongly favour *will* (Szmrecsanyi, 2003, p. 309; Torres Cacoullos & Walker, 2009, p. 343), indicating "contingent future references" trigger more *will* than *be going to* (Torres Cacoullos & Walker, 2009, p. 341), while sentences that start with *I think, I don't know*, *you know* (functioning more as discourse markers than main clauses), favour *be going to* and disfavour *will* (Torres Cacoullos & Walker, 2009, p. 342).

Polarity, which refers to the positive or negative quality of an expression within sentences or clauses, has also been posited to play a role, though results differ across studies. Some studies have found *be going to* to be favoured in negative polarity clauses (Canadian English in Quebec, Torres Cacoullos and Walker (2009, p. 346)); others have found no significant effect (Toronto English: Denis and Tagliamonte (2018); Tyneside English: Fehringer and Corrigan (2015); Ghanaian English: Schneider (2016)). It has also been argued that there may be geographical differences. Szmrecsanyi (2003, p. 305) found that *be going to* was favoured in negative polarity clauses in American English, but in positive polarity clauses in British English. Thus, it is interesting to look at polarity in Australian English.

For the effect of grammatical person of subject, given its original meaning associated with volition and willingness, *will* is predicted to occur with first person subjects to express personal attitudes (Poplack & Tagliamonte, 1999, p. 335). Having developed from the motion verb *go* that expressed goal-oriented intention originally, *be going to* is hypothesised to be favoured by non-first-person animate subjects (Poplack & Tagliamonte, 1999, p. 334). These predictions have been confirmed by Fehringer and Corrigan (2015, p. 210) in their study of Tyneside English in the UK, where they found that *will* is favoured more with first person subjects than with second and third person subjects, while *be going to* has come to be favoured most strongly by second person subjects. However, it has been argued that if *be going to* has generalised to be favoured by first person or inanimate subjects, an advanced degree of grammaticalisation

could be ascertained. The study conducted by Torres Cacoullos and Walker (2009, p. 339) provided supporting evidence, where they found that first person singular subjects favour *will* (in particular the frequent *I'll* collocations), and second person subjects disfavour it, but they did not find a significant effect for animacy. Thus, they argued that "both variants have generalised beyond their original meanings" (Torres Cacoullos & Walker, 2009, p. 338). Similarly, Denis and Tagliamonte (2018, p. 423) found that overall both first person and inanimate subjects disfavour *be going to*, but there is an interaction effect between animacy/subject type and age, that is, "younger people have an increasingly levelled use of *be going to* across all subjects".

Additionally, the type of temporal adverbial shows robust effects on the form of the future temporal reference in Quebec English (Torres Cacoullos & Walker, 2009, p. 332), and in other languages: Canadian French (Poplack & Turpin, 1999, p. 151), Brazilian Portuguese (Poplack & Malvar, 2007, p. 141), and Spanish (Aaron, 2010, p. 10). In English, non-specific/indefinite adverbials (such as *never, eventually, later, someday, soon*) have been found to favour *will* due to the high frequency of *X will/'ll never* collocations (Torres Cacoullos & Walker, 2009, p. 340). In contrast, sentences without a temporal adverbial have been found to favour *be going to*, and it is argued that "this greater independence of *be going to* from adverbial modification lends support to the view that temporal meaning was present as an inference from the spatial meaning of *be going to* from the beginning" (Torres Cacoullos & Walker, 2009, p. 341).

And finally, the effect of temporal proximity has been examined. As noted above, it has been proposed that, while *will* is a "default option" as a plain indication of the future irrespective of the temporal proximity of future reference (Poplack & Tagliamonte, 1999, p. 321), *be going to* encodes "current orientation" to imminent and planned future (Bergs, 2010, p. 218; Nicolle, 1997, p. 375). Thus, the hypothesis is that, due to its origin in a purposive construction, *be going to* was initially associated with more proximal reference (see discussion in Hopper & Traugott, 2003, p. 89), a meaning which may weaken over time as the form grammaticalises (Torres Cacoullos & Walker, 2009, p. 326). Such a weakening is reported in Fehringer and Corrigan (2015) who found that, in Tyneside English, *will* was favoured most strongly in distal temporal reference in the earlier data (1960s-70s), while no significant favouring effects were found in latter time periods (1990s and 2000s). In their study of future temporal reference in Quebec English, Torres Cacoullos and Walker (2009, p. 338) found that the effect of proximity was "virtually nil", indicating there was no correlation between the degree of proximity and the rates of *will* and *be going to*. And in one study, the opposite has been reported, namely a favouring of *be going to* in distal, and *will* in proximal contexts in Toronto English (data was

collected from 2003 to 2004) (Denis & Tagliamonte, 2018, p. 423). Thus, the effect of proximity appears to vary across varieties, potentially in line with the differences in the time depth of data.

In summary, future temporal reference appears to be approaching a point of stabilisation in various varieties of North American English, whereas it remains an ongoing change in different varieties of British English. Linguistic conditioning has been widely examined and it exhibits remarkable similarity across varieties, with *be going to* favoured in questions, subordinate clauses, with second-person subjects, and with temporal adverbials, but also some differences, as the effects of polarity and proximity do not consistently hold. As no study has been conducted to examine future temporal reference in Australian English, it is meaningful to assess whether it is undergoing change and how these linguistic predictors operate in this variety.

Based on what has been established in the previous literature, in this chapter I explore the timing of change in future temporal reference in Australian English; the similarities and differences in the speech patterning of Chinese and Anglo Australians in taking up the change; the ethnic differences in the speech patterning among the Chinese Australians, as seen in measures of ethnic orientation. To investigate potential substrate transfer from Cantonese in the speech patterning of the Chinese Australians, I also analyse the patterns among speakers of Hong Kong English.

5.3 Methodology

5.3.1 Circumscribing the variable context

An R script was used to extract all the possible forms of the *will* and *be going to* variants, including *will, 'll, won't, be going to, gonna*. Initially, I extracted 986 tokens from the Sydney Speaks 2010s corpus (312 *be going to* and 674 *will*). To increase the total token count, I extracted another 827 tokens from an additional 30 minutes of recordings which have undergone the first round of transcription but have not been fully polished (219 *be going to* and 608 *will*). In ICE-HK, I extracted 1,222 tokens (165 *be going to* and 1,057 *will*). Then, I circumscribed the context(s) where both variants may co-occur, following Poplack and Turpin (1999, p. 143) and Poplack and Tagliamonte (1999, p. 325) as any sentence with either *be going to* or *will* that expresses unambiguous future time. I thus excluded all non-future uses,

namely uses for generic situations, habitual uses, lexicalised expressions and uses of *go* as a motion verb, as in the following examples.

Exclusions (non-future temporal reference uses)

(19) Generic:
*Every little boy **will go** through a phase where he likes pink.*

[SydS_AYF_014_Hayley]

(20) Habitual:
Just like a Sunday dinner,
usually,
*Laura and her boyfriend **will come over**.*

[SydS_AYF_089_Sadie]

(21) Lexicalised expression:
*They can make of it what they **will**.*

[SydS_AOM_086_Nigel]

(22) *Be going to* as motion:
*Sometimes it would **be going** to my coach's garage.*

[SydS_AYM_050_Jaden]

I also did not count future-in-the-past contexts, as shown in example (23), since prior research showed that they form a distinct variable system in terms of time reference and semantic nuances, and are subject to different constraints compared to other future temporal reference contexts (Poplack & Tagliamonte, 1999, p. 334; Royster & Steadman, 1923/1968, p. 400).

(23)
*Cause they **were gonna demolish** it.*

[SydS_AYM_101_Jeremy]

Following this protocol, more than half of all *will* tokens were removed (n = 607), with the majority representing habitual or generic uses (557/607). 74 tokens of *be going to* were also removed, which were primarily in future-in-the-past contexts. The final dataset from the 75 Adult Anglo Australians, Young Adult Anglo Australians, and Chinese Australians in the Sydney Speaks corpus includes 1,132 tokens, with an overall rate of 40% *be going to*.

In the case of ICE-HK, around one third of the instances of *will* did not refer to future temporal reference (n = 361) (a smaller proportion than for the Sydney Speaks corpus, reflecting the greater use of future *will* in ICE-HK). 37 tokens of *be going to* were also excluded. The final dataset from ICE-HK comprises a total of 824 tokens, with a rate of 16% *be going to*, produced by a total of 128 speakers.

5.3.2 Statistical analyses

As in the previous chapter on prevocalic *the*, I employ both descriptive and inferential statistical methods. I begin by presenting descriptive statistics that illustrate the distribution of social and linguistic predictors. Subsequently, to examine both the social and linguistic conditioning, I employ three multivariate modelling methods, namely, Conditional Inference Tree, Random Forest for the Sydney Speaks and ICE-HK datasets combined and Mixed-effects Generalised Binomial Logistical Regression. For the latter, I conduct separate analyses on the Sydney Speaks and ICE-HK datasets, respectively.

Specifically, I conducted three sets of regression models following the analytical steps employed in the previous chapter on prevocalic *the* for the Sydney Speaks dataset. Comparing *be going to* vs. *will*: in apparent time, focusing on Anglo Australians from both age groups; across ethnicity for Young Adult Anglo and Chinese Australians; for Chinese Australians only with different measures of ethnic orientation. A separate regression model was conducted for ICE-HK, incorporating all variable speakers, whose rates of use were illustrated in Table 11 below.

In each regression model, the realisation of future temporal reference served as the dependent variable (predicting the *be going to* variant). Random intercept was included for Speaker. It is important to note that the independent variables included in the models varied due to different data configurations. I will explain these differences below in Section 5.6.

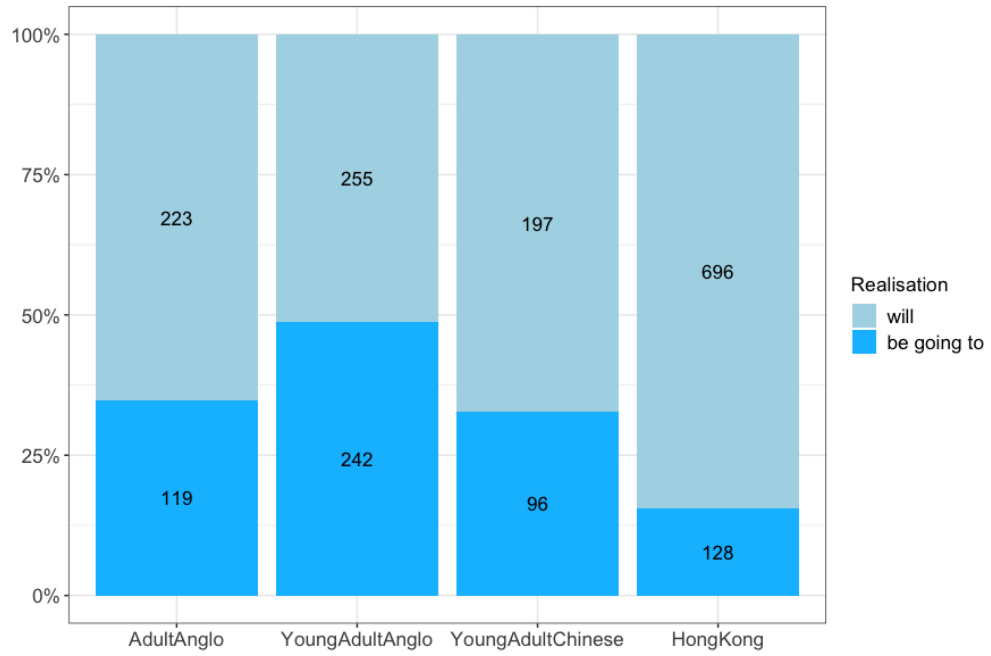
5.4 Data distribution for the predictors

All of the target tokens were annotated to determine the social and linguistic conditioning of the alternation between *will* and *be going to*. These constraints include social factors age, community, gender, social class, and linguistic factors sentence type, clause type, polarity, grammatical person of subject, temporal adverbials, and temporal proximity. Here, I present their distribution in Australian English and Hong Kong English, respectively.

5.4.1 Age and community

I start by examining the overall distribution of the variants of future temporal reference across different age groups and communities to gain an overview of its use in Australian English and Hong Kong English. Figure 25 displays the rates of the two variants for Adult Anglo, Young Adult Anglo, and Chinese Australians in the first three columns, and Hong Kong English speakers in the fourth column. The proportions of *will* and *be going to* (which add up to 100% for each group) are depicted in light blue and blue panels, respectively. The raw token counts for each variant are provided within each bar.

Figure 25 Distribution of the realisations of future temporal reference by Age and Community.



This chart reveals that among Adult Anglos, *be going to* accounts for just one third (35%) of occurrences, which increases for the Young Adult Anglos to 49%. This latter figure is similar to the usage rates observed in North American English speakers, as presented in Figure 24. For Young Adult Chinese Australians, however, the proportion of *be going to* (33%) is similar to that of the Adult Anglos. In contrast, in ICE-Hong Kong, *be going to* is used at an overall rate of just 16%.

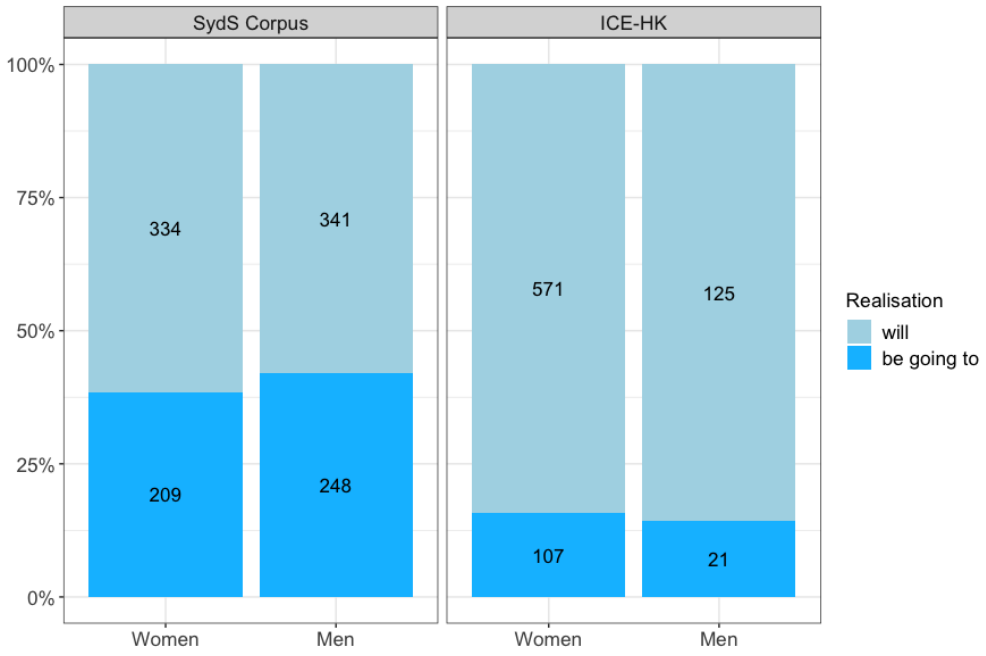
These patterns suggest that among Anglo Australians, there is an apparent time change in future temporal reference, with Young Adult Anglos using *be going to* at a higher rate compared to Adult Anglos, aligning with what has been observed in the UK (Tagliamonte,

Durham, & Smith, 2014, p. 84). Young Adult Chinese Australians would appear to lie behind here, as they utilise *be going to* at a rate similar to the previous generation of Adult Anglos. The ICE-Hong Kong data presents a much lower rate (the lowest among the varieties reported in Figure 24). This could be attributed to the association between formality and the use of *will*, as the ICE-HK conversations tend to be more formal than the sociolinguistic interviews in the Sydney Speaks corpus. Alternatively, as noted above in Section 5.1.2, this would be consistent with language transfer from Cantonese, for which I predicted a lower rate of *be going to*. Thus, we might ask whether the lower rate of *be going to* by the Chinese Australians relative to their Young Adult Anglo peers is also due to language transfer as part of a more general effect for ethnicity.

5.4.2 Gender

Figure 26 presents the proportional distribution of the realisations of future temporal reference by gender in Australian English and Hong Kong English, respectively. The x-axis represents a binary division of gender in each variety, namely women and men, while the y-axis indicates the proportion of tokens. In both varieties, there appears to be little gender effect. For Australian English, among women, the rate of *be going to* is 38%, and 42% for men. In ICE-Hong Kong, women have a rate of 16% and men 14%. Thus, in both varieties, men and women exhibit very similar usage rates of *be going to*.

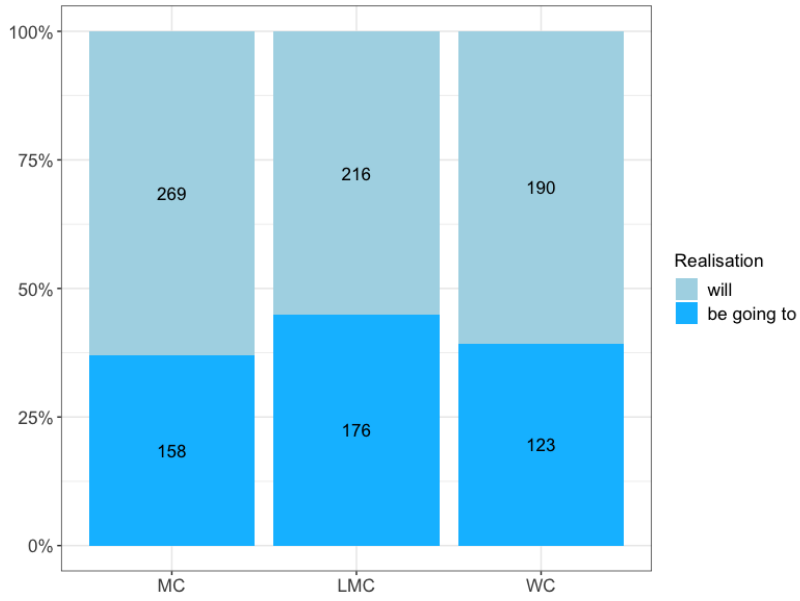
Figure 26 Distribution of the realisations of future temporal reference by Gender.



5.4.3 Social class

As there is no available socioeconomic information on the speakers from ICE-Hong Kong, I have only examined the social class effect in Australian English. As shown in Figure 27, speakers from the Middle Class have the lowest rate (37%), closely followed by the Working Class (39%), with the Lower Middle Class being slightly higher at 45%.

Figure 27 Distribution of the realisations of future temporal reference by Social Class in Sydney Speaks data.



5.4.4 Sentence type

Following previous research (e.g., Szmrecsanyi, 2003; Tagliamonte, Durham, & Smith, 2014), sentence type was coded as a binary variable in the current dataset, distinguishing between declaratives, as in example (24), and questions, as in example (25). Based on findings in previous literature, the hypothesis is that questions would favour *be going to*.

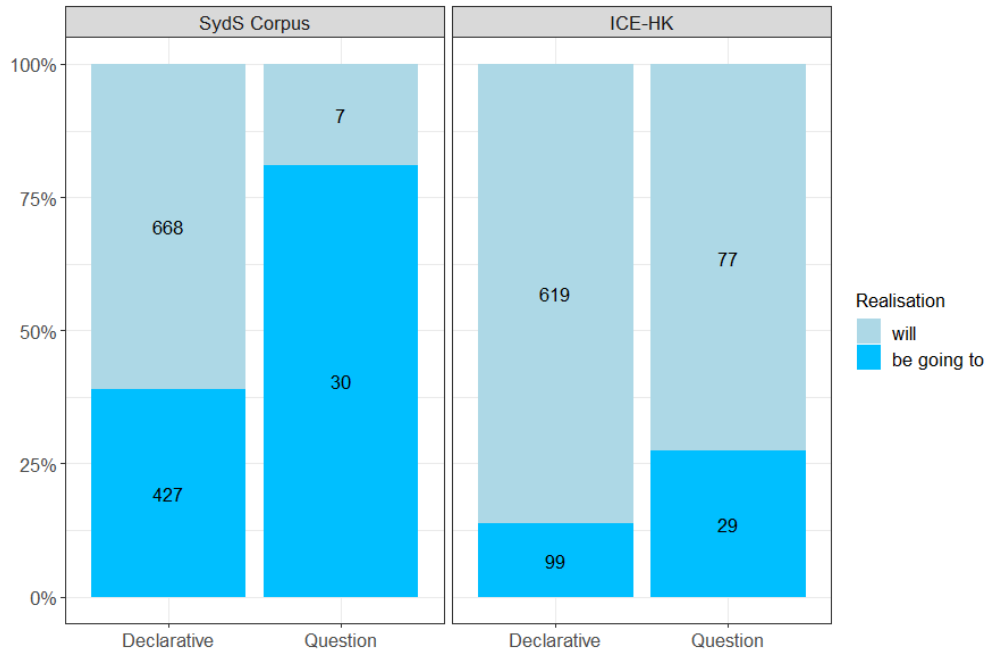
(24) Declarative:
so I will uh,
contact them

[ICE-HK_S1A_002_Iris]

(25) Question:
What's going to happen here?

Figure 28 displays the distributions by sentence type. In Australian English (the first two columns), in declarative sentences, *be going to* is used at a rate of 39%, while in questions, it increases to 81%. Among speakers of Hong Kong English (the last two columns), the rate of *be going to* is 14% in declaratives, but it increases to 27% in questions. These observed patterns in both varieties of English are similar, consistent with previous literature findings, indicating that questions with *be going to* maintain a nuance of intention, reflecting the preservation of the original constructional meaning of *going to* as a movement construction (Denis & Tagliamonte, 2018, p. 143; Torres Cacoullos & Walker, 2009, p. 343). However, it is important to note that there are only 143 tokens of questions out of a total of 1,956 tokens. Thus, this is a very minor form.

Figure 28 Distribution of the realisations of future temporal reference by Sentence Type.



5.4.5 Clause type

Following previous research (e.g., Fehringer & Corrigan, 2015; Poplack & Tagliamonte, 1999), two broad clause types were categorised: main clauses (including apodoses within this category) and subordinate clauses, as shown in sentences (26) and (27) respectively. Based on findings in previous literature, the hypothesis was that subordinate clauses would favour *be going to*.

(26) Main:

*aw **she will probably leave** in January*

[ICE-HK_S1A_003_Teresa]

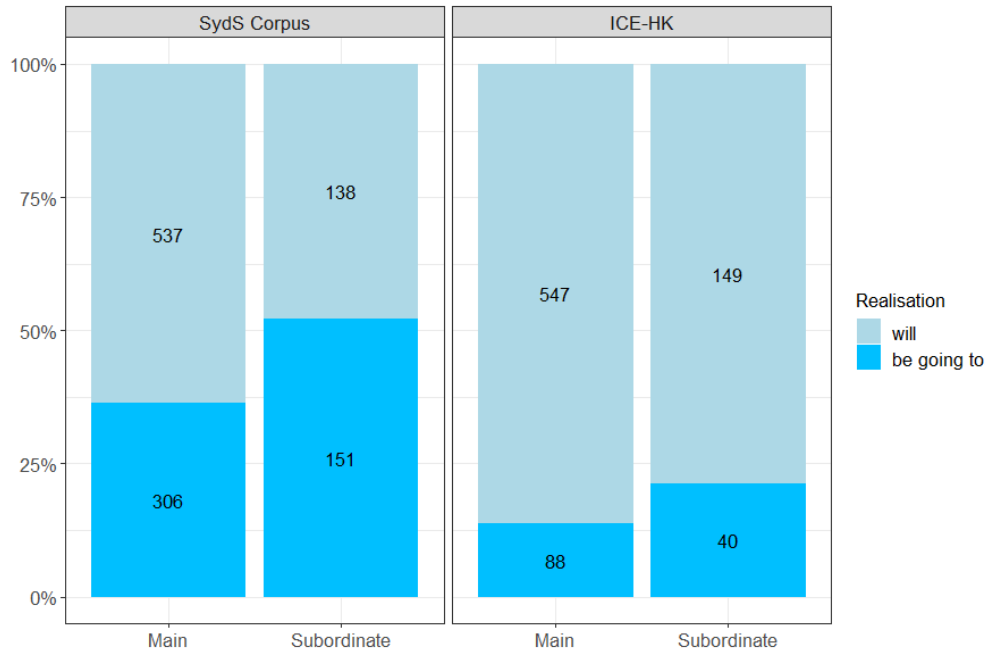
(27) Subordinate:

*But I'm hoping **she'll be finished** at the end of this year.*

[SydS_AOF_082_Bailey]

Figure 29 illustrates the distribution in both varieties. In the Sydney Speaks corpus, in main clauses, the rate of *be going to* is 36% compared with 52% in subordinate clauses. In ICE-HK, a similar pattern has been identified, wherein the rate of *be going to* is lower in main clauses compared to that in subordinate clauses, at 14% and 21%, respectively. These distribution patterns are consistent with the previous literature.

Figure 29 Distribution of the realisations of future temporal reference by Clause Type.



5.4.6 Polarity

The previous literature has reported a favouring of *be going to* in negative clauses (e.g., Canadian English in Quebec, Torres Cacoullos and Walker (2009, p. 346)), or no significant effect (e.g., Toronto English: Denis and Tagliamonte (2018); Tyneside English: Fehringer and Corrigan (2015); Ghanaian English: Schneider (2016)). To test the effect of polarity in

Australian English, I coded for positive polarity and negative polarity as in sentences (28) and (29). If polarity had an effect in this study, it would favour *be going to* in negative clauses.

(28) Positive:
*My mum **will cook** a lot of Chinese food.*

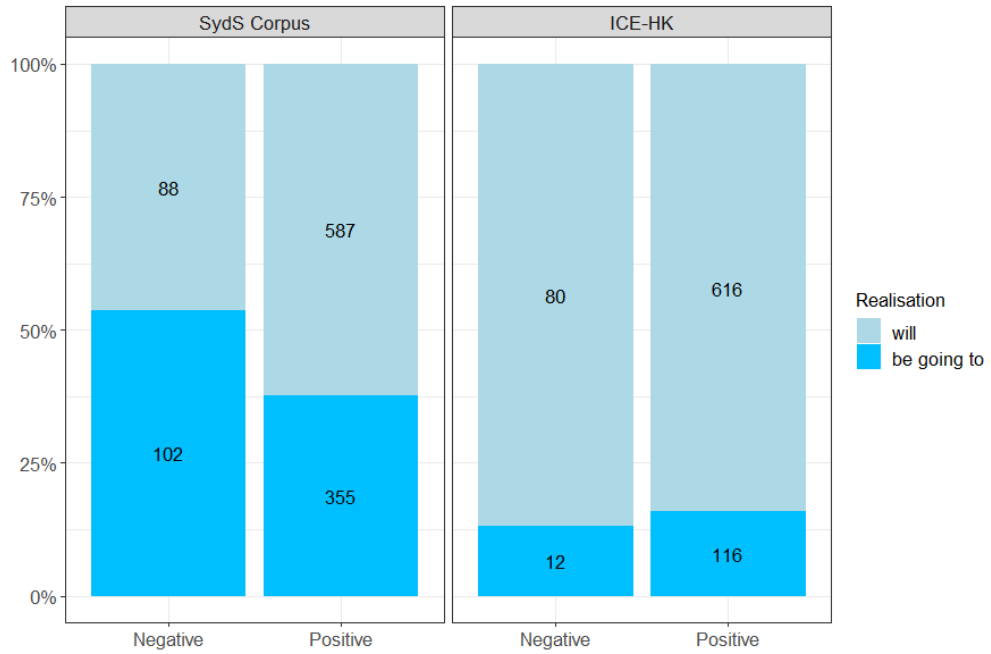
[ICE-HK_S1A_011_Christina]

(29) Negative:
*And **it's not going to make** any difference to what we do.*

[SydS_AOM_073_Perry]

Figure 30 illustrates the distribution of realisations by polarity. In the Sydney Speaks corpus, in the negative polarity context, the rate of *be going to* is 54% compared with 38% for positive polarity. In ICE-HK, the rate of *be going to* is 13% in the negative polarity context compared to 16% for positive polarity. Thus, it can be observed that the rate of *be going to* is higher in the negative polarity context in the Sydney Speaks corpus, consistent with the previous literature on Quebec English. However, there is no polarity effect in ICE-HK, as the rates of *be going to* in both negative and positive polarity contexts are very similar.

Figure 30 Distribution of the realisations of future temporal reference by Polarity.



5.4.7 Grammatical person of subject

Seven types of subjects were first distinguished, including first person singular and plural subjects, as shown in examples (30) and (31); second person subjects (32); third person singular and plural human subjects, (33) and (34); and third person singular and plural nonhuman subjects, (35) and (36).

(30) First person singular:
I will stay *in Hong Kong and probably live with my family*

[ICE-HK_S1A_038_Prudence]

(31) First person plural:
Do we all agree that ***we're going to have*** *some kind of uhm,*
role-play,

[ICE-HK_S1A_016_Lisa]

(32) Second person:
You're gonna pay *for the reimbursement costs.*

[SydS_AOM_105_Parker]

(33) Third person singular human:
He's gonna hit *me again.*

[SydS_AOM_105_Parker]

(34) Third person plural human:
They won't win.

[SydS_CYM_063_Callum]

(35) Third person singular non-human:
It will continue *to be more diluted I think.*

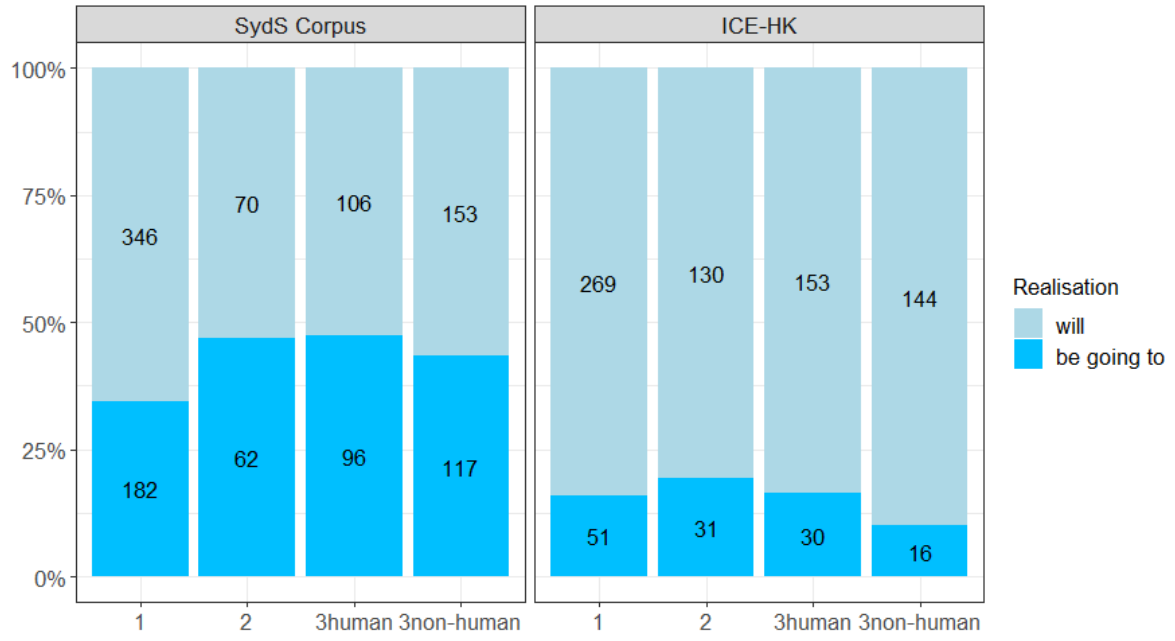
[SydS_CYM_075_Alec]

(36) Third person plural non-human:
Cable services aren't going to bite *into that at all.*

[SydS_CYM_063_Callum]

To mitigate data sparsity concerns, I collapsed the singular and plural for each person, resulting in four subject types: first, second, third person human, and third person nonhuman. In Figure 31, the distribution of occurrences across these categories is illustrated, which shows that there is minimal differentiation for person in both varieties, though in the Sydney Speaks corpus, first person subjects exhibit a slightly lower rate of *be going to* compared to the others, consistent with the prior literature which has reported a favouring of *will* with first person subjects (Fehringer & Corrigan, 2015, p. 210; Torres Cacoullos & Walker, 2009, p. 339). In ICE-HK, the rate of *be going to* is also relatively lower with first person subjects compared to second person and third person human subjects, although it is slightly higher than that observed with third person non-human subjects. According to the distributions in both varieties, two types of subjects were finally distinguished here: first person subjects (both singular and plural) and non-first person subjects. In the Sydney Speaks corpus, the rate of *be going to* is 34% with first-person subjects, and 46% with non-first person subjects (275/604). In ICE-HK, the rate of *be going to* is 16% with first-person subjects, and 15% with non-first person subjects (77/504).

Figure 31 Distribution of the realisations of future temporal reference by Grammatical Person of Subjects.



5.4.8 Temporal adverbial

The type of temporal adverbial shows robust effects on the form of the future temporal reference in Quebec English (Torres Cacoullos & Walker, 2009, p. 332), and in other languages (as noted in Section 5.2.3). To test its effect in the present study, I code for the presence of time adverbials in the same clause, distinguishing between specific temporal adverbials, including *now, tonight, tomorrow, this/that/another afternoon/week/summer/year* etc., as well as clock times and calendar dates (as in (37)), and non-specific temporal adverbials, including *soon, later, someday, ever, forever, never*, etc. (as in (38)). Sentences without (temporal) adverbials are coded as "NoAdv" (as in (39)).

(37) Specific:
but maybe ***I will make a trip uh after the final examination in May****.*

[ICE-HK_S1A_008_Fanny]

(38) Non-Specific:
Where there is never ever ever gonna be *any sort of development.*

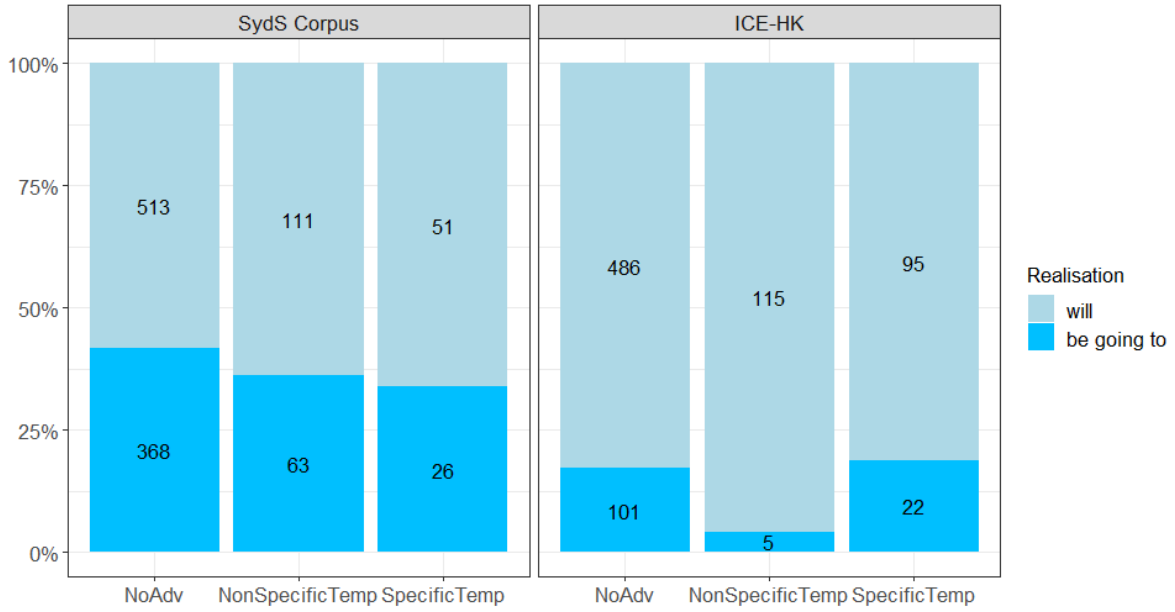
[SydS_AYM_050_Jaden]

(39) No Adverbial:
They'll bring *violence into an area.*

[SydS_AOF_005_Jamie]

The distribution in both varieties is presented in Figure 32, which shows that in the Sydney Speaks corpus, in contexts without adverbials, the rate of *be going to* is 42% vs. 36% in contexts with non-specific temporal adverbials, and 34% in contexts with specific temporal adverbials. These patterns suggest that *be going to* is slightly more frequent in contexts without adverbials in Australian English, but the effect of adverbials appears to be weak. In ICE-HK, the rate of *be going to* stands at 17% in contexts without adverbials, slightly increasing to 19% in contexts with specific temporal adverbials. This suggests minimal differentiation between these two contexts. However, the rate of *be going to* drops to only 4% in contexts with non-specific temporal adverbials. This substantial decline indicates a pronounced adverbial effect in ICE-HK, which might be attributed to the language transfer effect from Cantonese, as discussed in Section 5.1.2. These observed patterns imply a variance in the variable grammar between these two varieties of English, which will be further examined through multivariate analyses below.

Figure 32 Distribution of the realisations of future temporal reference by Temporal Adverbial.



5.4.9 Temporal proximity

Temporal proximity has been operationalised in various ways, and its effect appears to vary across different varieties. In this study, temporal proximity was divided into two categories to distinguish between events that were to occur on the same day versus those scheduled for the following day or later. This approach has been employed in multiple other studies (cf., Denis & Tagliamonte, 2018, p. 416; Poplack & Malvar, 2007, p. 141; Poplack & Turpin, 1999, p. 150; Torres Cacoullos & Walker, 2009, p. 330).

Proximity was identified based on a range of contextual clues, including temporal adverbials (e.g., (40) and (41)), specific dates (e.g., (42)), and *when/if/unless*-clauses that specified a time frame (e.g., (43)). When no explicit clues of proximity were present in the same clause, the broader discourse context was considered, such as imminent sequential actions (e.g., (44)). For approximately 6% of the tokens (67/1,059), it was not possible to determine whether they referred to a time frame within the same day or not (e.g., (45)), and these were set aside.

(40) Proximate:
uh I think she'll be back ***in forty minutes time.***

[ICE-HK_S1A_024_Wing Chi]

(41) Distal:
And then I'll do three,
***in my first semester next year**.*

[SydS_AYF_016_Jocelyn]

Specific dates:
(42) Distal:
*I will expect answers **tomorrow**.*

[SydS_AOM_105_Parker]

when/if/unless-clauses:
(43) Distal:
*so they're going to be awesome **when they're older**,*

[SydS_AYF_088_Emma]

Discourse context:
(44) Proximate:
everyone left work at about .. two o'clock?
...(1.0) and I thought --
***I'm not gonna catch** a train.*
***... I'm not gonna catch** a bus.*
***I'm gonna walk** home.*
so I walked home.

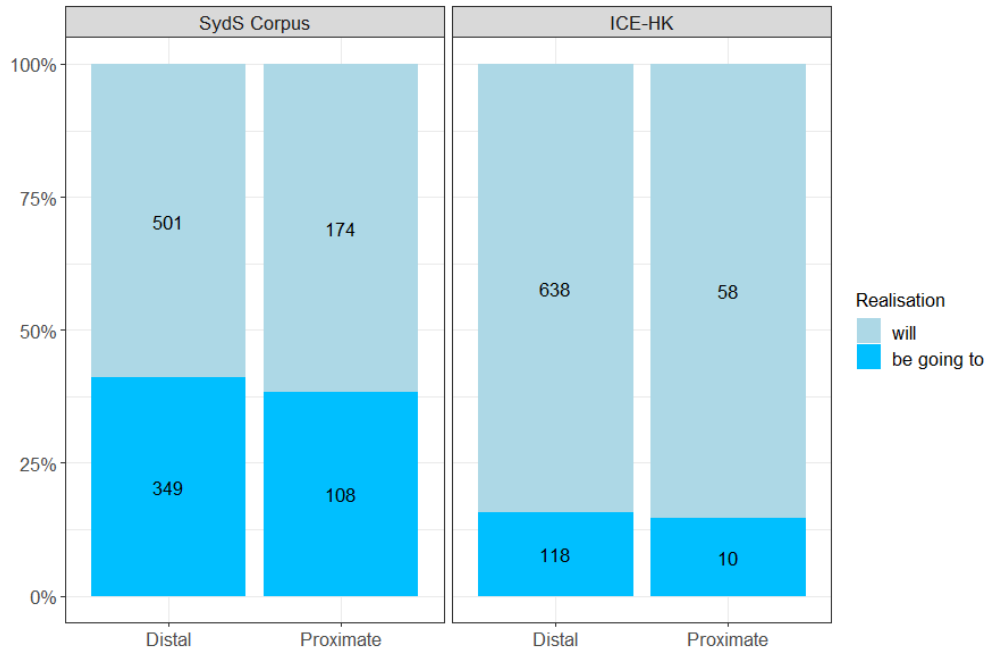
[SydS_AOF_005_Jamie]

(45) Proximity unclear:
So who knows what they're going to do.

[SydS_AOF_009_Deidre]

Figure 33 illustrates the distribution by proximity in both varieties. In the Sydney Speaks corpus, the rate of *be going to* is 41% with distal temporal reference, and 38% with proximate temporal reference. In ICE-HK, the rate of *be going to* is 16% with distal temporal reference, and 15% with proximate temporal reference. Thus, there is a slightly higher rate of *be going to* with proximate temporal reference, but the effect would appear to be minimal in both varieties.

Figure 33 Distribution of the realisations of future temporal reference by Temporal Proximity.



As demonstrated by the data distributions discussed above, there is notable variability in the effects of both social and linguistic factors. Among Young Adult Anglos, the rate of usage of *be going to* is at its highest, whereas the speakers in ICE-Hong Kong exhibit the lowest rate among all the groups. Gender seems to have minimal impact on both Australian English and Hong Kong English. In Australian English, concerning social class, LMC speakers tend to use *be going to* at a slightly higher rate compared to MC and WC speakers. Regarding linguistic conditioning, *be going to* is more prevalent in questions than in declarative sentences, in subordinate compared to main clauses, and in negative versus positive polarity contexts. Subject person, adverbials, and proximity exhibit relatively modest effects in both Australian English and Hong Kong English, but they also demonstrate differences in their effects between the two varieties.

These distributional patterns suggest some apparent differences in the effects of these predictors. Nevertheless, do these differences persist when considering the impact of all predictors together in multivariate models? Additionally, are there differences for Hong Kong English that can be attributed to language transfer from Cantonese, and do we see similar transfer effects in the English of Chinese Australians? I use both tree-based and regression models to address these questions.

5.5 Recursive partitioning

I first use recursive partitioning to be able to consider all the data in the one analysis. Figure 34 shows a conditional inference tree from the full dataset which includes the social predictors of age-community (that is, Adult Anglo, Young Adult Anglo, Young Adult Chinese, Hong Kong), gender (men vs. women) and class (middle vs. lower middle vs. working vs. none for ICE-HK); and the linguistic predictors of sentence type (declarative vs. question), polarity (positive vs. negative), clause type (main vs. subordinate), adverbial (specific vs. non-specific vs. no adverbial), subject (first vs. non-first) and proximity (distal vs. proximate)[15]. Its classification accuracy is 74%, which is significantly better than the baseline of 70% when always choosing the most frequent variant ($p_{binom} < 0.001$). The C-index for the model is 0.73, indicating that this analysis discriminates well between the variants (cf., Baayen, 2008, p. 204).

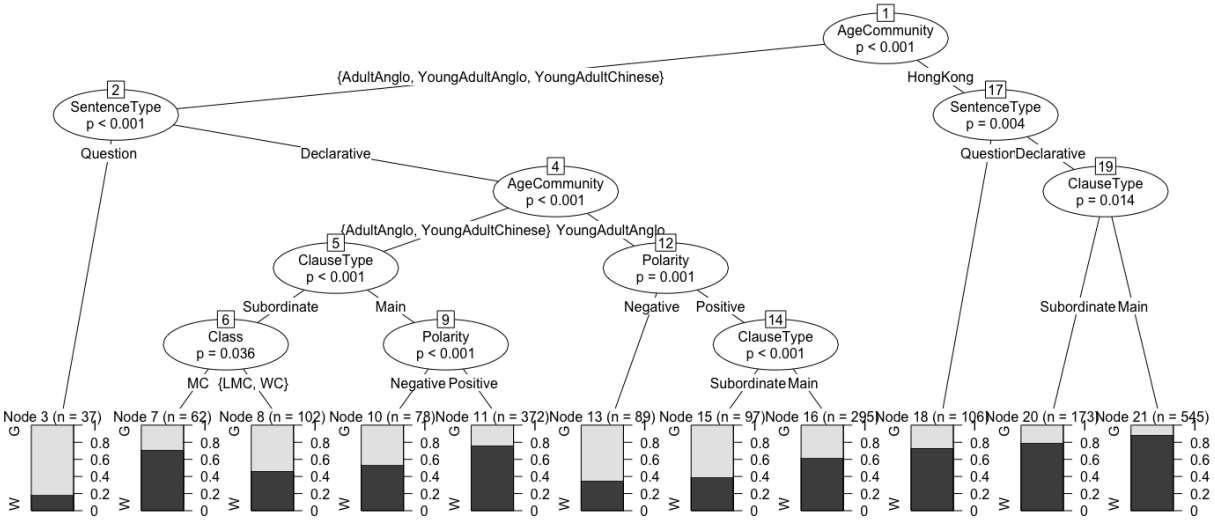
The result shows that the speakers in the Australian and Hong Kong corpora pattern differently, as this is the first split in the tree (cf., Node 1). For ICE-HK, gender is the only social factor that can be tested (as ICE-HK speakers are of the similar ages and social class information is not available), and it does not come up in the tree, indicating it does not have a significant effect. This is consistent with the gender-based distribution in Figure 26 above. For the linguistic predictors in Hong Kong English, sentence type (cf., Node 17) and clause type (cf., Node 19) are significant — *be going to* is favoured in questions over declaratives and, in declaratives, in subordinate over main clauses (cf., Nodes 18, 20 & 21). The Australians exhibit a similar effect, demonstrating a greater use of *be going to* in questions (cf., Nodes 2 & 3), with *be going to* being nearly categorical in questions and showing no other conditioning factors, so I will exclude all tokens of questions from the mixed-effects regression models below. In declaratives, the first significant social predictor is age-community (cf., Node 4), whereby the Young Adult Chinese Australians pattern more like the Adult Anglo Australians than their Anglo peer cohort, consistent with the similarity we saw across these groups in rates of use in Figure 25. For Young Adult Anglo Australians, polarity and clause type have effects, with *be going to* favoured in negative polarity and in subordinate clauses with positive polarity, both over main clauses with positive polarity (cf. Nodes 12-16). For Adult Anglos and Young Adult Chinese, polarity, clause type, and social class come into play. Once again, *be going to* is least favoured

[15] Formula: ctree (Realisation ~ AgeCommunity + Gender + Class + SentenceType + Proximity + ClauseType + Adverbial + SubjectType + Polarity) with control minbucket = 20.

in main clauses with positive polarity (cf. Nodes 9-11). In subordinate clauses, there is a class effect, with LMC and WC speakers favouring *be going to* over MC speakers (cf. Nodes 6-8).

The main takeaway from this analysis is that Australian English and Hong Kong English are distinct varieties, differing both in rates of use (Figure 25), and in some aspects of the variable grammar, consistent with what we saw for the data distributions (see Section 5.4). The impact of linguistic constraints such as sentence type and clause type are shared in terms of a favouring of *be going to* in questions over declaratives and in subordinate over main clauses, while the influence of polarity is observed only in Australian English, where *be going to* is favoured in positive polarity over negative polarity. However, though one of the predictions is that Adverbial would have an effect in Hong Kong English due to the language transfer effect from Cantonese, it does not show an effect in either variety. Additionally, age-community emerges as a significant predictor for Australian English, and it interacts with sentence type, clause type, polarity, and social class. Consequently, further analysis of the interactions among these social and linguistic predictors should be conducted using additional multivariate methods.

Figure 34 Conditional inference tree analysis of the realisations of future temporal reference in both varieties (n = 1,956).



Notes. W (*will*), G (*be going to*).

I then ran a random forest analysis to determine the conditional importance ranking of variables. Figure 35 presents the results from a random forest model with 1,000 trees and with

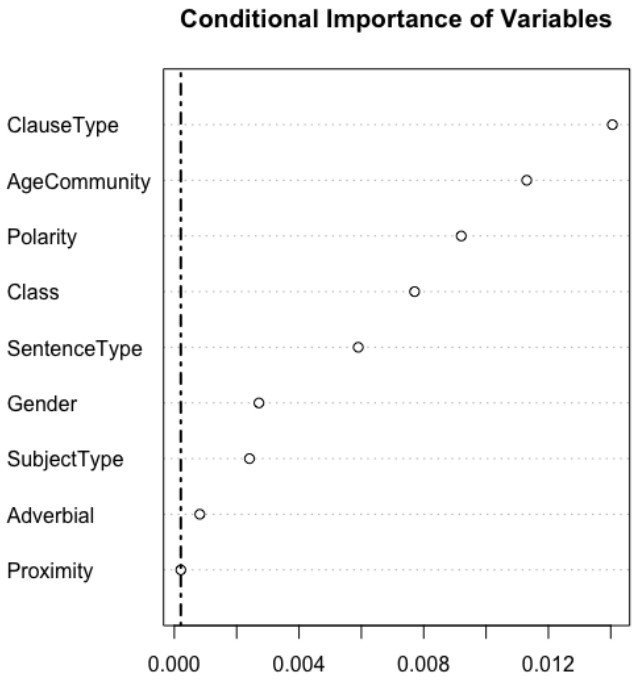
4 variables sampled at each split[16]. Its classification accuracy is 77.0 per cent, which is significantly better than the baseline of 70.0 per cent when always choosing the most frequent variant ($p_{binom} < 0.001$). The C-index for the model is 0.78, indicating that this analysis discriminates well between the variants (cf., Baayen, 2008, p. 204).

Here, the ranking of the importance of factors (reflected in the ordering in the vertical axis) is not identical to that in the conditional inference tree, potentially indicating overfitting of the conditional inference tree model to the data. One difference is that age-community is the first split in the conditional inference tree but ranks second to Clause Type here. Consistent with the result of the conditional inference tree, age-community, clause type, polarity, class, and sentence type are all important factors in the random forest, so they will be further explored by running mixed-effects regression models to test the significance of these variables and take the variability of individuals into account. Proximity has not been selected as important by the conditional inference tree and it ranks the lowest in the random forest, indicating its effect is weak in both varieties, so it will not be included in the regression models[17]. Gender, subject person and adverbial are returned as important variables in the random forest, but not in the conditional inference tree; these will also be explored by the mixed-effects regression models to determine whether they are statistically significant predictors.

[16] Formula: cforest (Realisation ~ AgeCommunity + Gender+ Class + SentenceType + Proximity + ClauseType + Adverbial + SubjectType + Polarity, controls = cforest_unbiased (ntree = 1000, mtry = 4))

[17] I tested the effect of proximity in the first regression model on the apparent time change of this variable for the Anglos, and it was not significant, which confirmed the results of the tree-based models and provided further justification of not including it in the following regression models.

Figure 35 Random forest analysis of the realisations of future temporal reference in both varieties (n = 1,956).



5.6 Regression analyses

I now conduct the final set of analyses, zooming in on the different groups and using mixed-effects logistic regression models for a more rigorous comparison across them. As with the previous variable in Chapter 4, before proceeding with this, some exclusions based on data distribution are necessary.

First, despite the strong preference for *be going to* in questions among Australians, there are only 37 tokens in questions (3.3% of the data, 81% *be going to*), with men exclusively using *be going to* in questions (n = 17). Including sentence type as a predictor in regression models under these circumstances could lead to biased results. To ensure comparability, I also exclude questions in Hong Kong English (n = 106, 13% of the data, 27% *be going to*) (indicating a similar preference for *be going to* in questions over declaratives in ICE-HK as revealed by the tree-based models). After excluding all tokens from questions, the dataset comprises 1,095 tokens from Australian English and 718 tokens from Hong Kong English, all of which are declaratives.

Another issue is that almost three-quarters of the speakers in ICE-HK (94 out of 128) produce only one variant. This is largely due to low token numbers: the 94 categorical speakers produce

between one and 9 tokens each (Mean = 4.24, SD = 2.1). 92 speakers categorically use *will* (n = 439), and 2 categorically use *be going to* (each of whom produces just one token). Including a large number of speakers for whom I do not have evidence of variability may skew the results. Therefore, I exclude these speakers, leaving 277 tokens from 35 people from Hong Kong for analysis (range = 2 ~ 20/speaker, Mean = 8, SD = 4.84). After the exclusion, the rate of *be going to* is 35%, as indicated in Table 11 below. For the Australian groups, there are 7 non-variable speakers, including 2 Adult Anglos (Denis: 5 tokens of *will*; Shelly: 3 tokens of *be going to*) and 5 Chinese Australians (all categorically use *will*: Aaron 4; Isaac 4; Alec 5; Caroline 5; Karmen 10). I also exclude these speakers, leaving 1,059 tokens from 68 Australians for analysis (range = 3 ~ 51/speaker, Mean = 16, SD = 10.79). Though I exclude these categorical speakers, it is worth noting that they conform with the predicted patterns, as from ICE-HK, nearly all, and from the Chinese Australians, all are categorical users of the majority variant, *will.*

The distribution of *be going to* (vs. *will*) across groups in declaratives and for variable speakers is presented in Table 11. This adjustment results in a more meaningful and comparable dataset for ICE-HK when compared to the Sydney Speaks data and allows me to more meaningfully include Speaker as a random effect in the regression models. Initially, the total token count for ICE-HK was 824, with 16% of instances realised as *be going to* (128/824). Now, considering only variable speakers and declarative clauses, the rates for the three Australian groups are similar to those seen in Figure 25 above – 48% *be going to* for the Young Adult Anglos, and 34% for both the Adult Anglos and the Young Adult Chinese. For ICE-HK, however, because nearly all the excluded speakers are categorical *will* users, the rate of *be going to* is substantially higher than prior to these exclusions, and is now parallel to that of the Adult Anglos and the Young Adult Chinese Australians, at 35%. This provides the data for which I can conduct meaningful comparative analyses.

Table 11 Distribution of *be going to* (vs. *will*) across groups (variable speakers only, in declaratives).

	Adult Anglos	**Young Adult Anglos**	**Young Adult Chinese**	**Hong Kongers**	**Total N**
Rate *be going to*	34%	48%	34%	35%	
Subtotal N	325	481	253	277	1,333

I am now ready to analyse the conditioning of future temporal reference using mixed-effects regression models. Similar to the analysis for *the*+VOWEL, I start with the apparent-time analysis, followed by an examination across ethnicity for the Young Adults. Then, I compare across measures of ethnic orientation specifically for the Chinese subgroup and, finally, investigate future temporal reference in the ICE-HK dataset.

5.6.1 Apparent time: Anglo Adults vs. Young Adults

To investigate whether future temporal reference displays apparent time change in Australian English, I compared Adult Anglo Australians with Young Adult Anglo Australians. As the conditional inference tree showed that there was a three-way interaction between age (Adult vs. Young Adult), clause (Main vs. Subordinate), and polarity (Negative vs. Polarity), and a two-way interaction between age and class (MC vs. LMC vs. WC), these interactions were included in the regression model. Additionally, I included the interaction between class and gender (Men vs. Women) to explore potential effects. Other linguistic factors, including subject (First vs. Other) and adverbial (No Adv. vs. Specific Adv. vs. Non-specific Adv.), were included as main effects. Thus, the maximal model included a three-way interaction (Age * Clause * Polarity), two two-way interactions (Age * Class and Class * Gender), and the main effects of Adverbial and Subject.

The results from the pruned model (retaining only significant predictors) are presented in Table 12.[18] The regression analyses confirmed a significant increase in *be going to* with the Young Adult Anglos, indicating an apparent time change, even though the Adults also use *be going to* at a reasonable rate. These patterns suggest that future temporal reference is an established but ongoing change in Australian English. There is a significant interaction between the social factors of Class and Gender, and the interaction between Class and Age approaches significance. For the linguistic predictors, the interaction effect between Clause and Polarity is significant, as well as the main effect of Subject. To enhance the interpretation of these social and linguistic effects, they are visualised below.

[18] Formula: glmer (Realisation ~ Age * Class + Class * Gender+ Clause * Polarity + Subject + (1|Speaker))

Table 12 Model summary for the regression on the realisation of *be going to* (vs. *will*) for Adult and Young Adult Anglo Australians.

	Estimate	Std. Error	z value	Sig.
Intercept	-2.35	0.43	-5.49	<0.001
Age Adult vs. **YoungAdult**	1.42	0.40	3.53	<0.001
Class Middle vs. **Lower Middle Class**	1.49	0.48	3.08	<0.01
Class Middle vs. **Working Class**	1.22	0.55	2.22	<0.05
Gender Men vs. **Women**	0.78	0.38	2.03	<0.05
Clause Main vs. **Subordinate**	1.10	0.20	5.58	<0.001
Polarity Positive vs. **Negative**	1.09	0.23	4.67	<0.001
Subject First vs. **Other**	0.35	0.16	2.17	<0.05
Age Adult vs. **YoungAdult**: Class Middle vs. **Lower Middle Class**	-0.96	0.53	-1.83	0.068
Age Adult vs. **YoungAdult**: Class Middle vs. **Working Class**	-0.95	0.55	-1.73	0.083
Class Middle vs. **Lower Middle Class**: Gender Men vs. **Women**	-1.01	0.52	-1.95	0.051
Class Middle vs. **Working Class**: Gender Men vs. **Women**	-1.16	0.52	-2.22	<0.05
Clause Main vs. **Subordinate**: Polarity Positive vs. **Negative**	-1.43	0.46	-3.12	<0.01

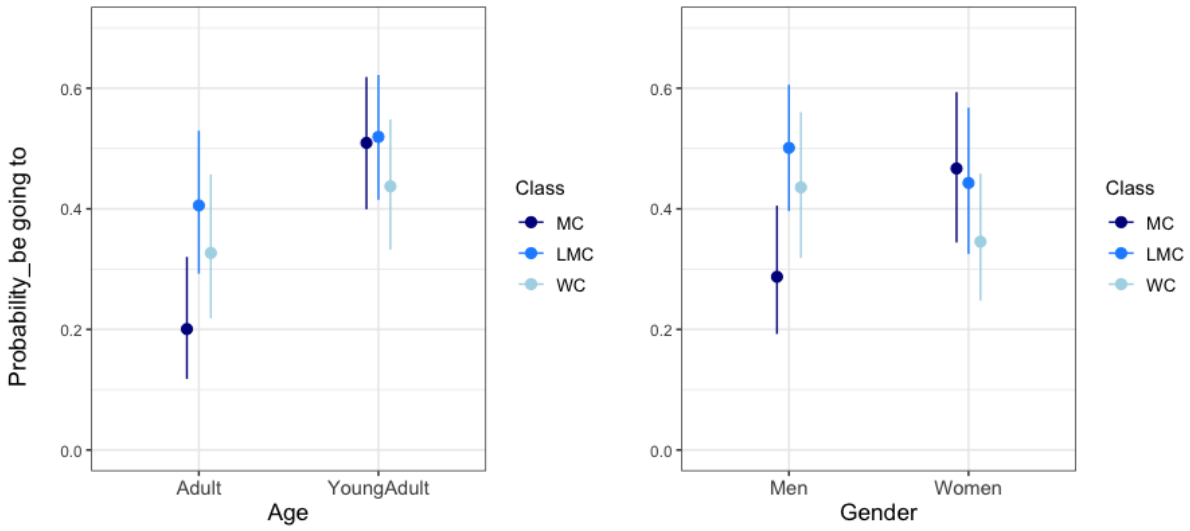
For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of *be going to*.

Overall rate of *be going to* is 42% (339/806). N Speakers = 50, Speaker variance = 0.139 (*SD* = 0.373); Log likelihood: -497.8; AIC: 1023.5; BIC: 1089.2. No significant effect for Adverbial.

Figure 36 presents visualisations of the interactions for age by class (on the left) and gender by class (on the right). The horizontal axis represents two groups of Anglo Australians categorised by Age, with Adults on the left and Young Adults on the right. The vertical axis illustrates the predicted probability of *be going to*, with higher representing greater probability of *be going to*. The three class groups are colour-coded, with MC in darker blue, LMC in blue, and WC in light blue. As we see here, the Young Adults exhibit an overall higher rate of *be going to* compared to the Adults, with the class effect evident for the Adults, such that MC Adults least favour *be going to*. This class effect has diminished over time, as there is no class distinction among Young Adult Anglos.

For the gender by class interaction in the right panel of Figure 36, we see that MC Men are those that most disfavour *be going to*. Thus, it is the Middle Class, in particular for Adults and for men, who are most lagging in the change to *be going to*.

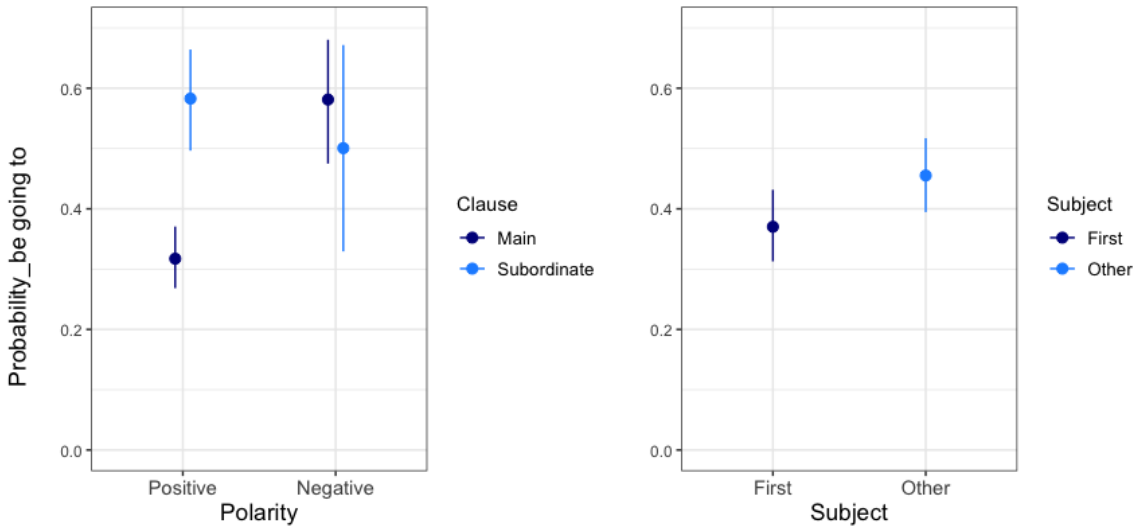
Figure 36 Effect plots of the interactions between Age and Class and between Gender and Class for *be going to* (vs. *will*) for Anglo Australians.



Regarding linguistic conditioning, in line with our earlier observations in the conditional inference tree, there is an interaction between Clause and Polarity, which is visualised in the left panel of Figure 37. The horizontal axis distinguishes two polarity contexts: Positive on the left and Negative on the right, with colour marking clause type. In positive polarity contexts, *be going to* is favoured in subordinate clauses (e.g., *so who knows what they're going to do*), while there is no such effect in negative polarity contexts (e.g., *I'm not going to give you another wave*). There is no significant three-way interaction between Age, Clause, and Polarity, indicating that the interaction effect between Clause and Polarity is retained over time.

The right panel of Figure 37 presents a visualisation of the main effect of Subject. Here, we see that *be going to* is most favoured with non-first person subjects, consistent with the findings in other studies (cf., Fehringer & Corrigan, 2015, p. 210; Poplack & Tagliamonte, 1999, p. 334; Torres Cacoullos & Walker, 2009, p. 339), and the tendency we observed for the distribution shown in Figure 31.

Figure 37 Effect plots of the interaction between Clause and Polarity and the main effect of Subject for *be going to* (vs. *will*) for Anglo Australians.



In summary, in the above apparent time analysis of future temporal reference by Anglo Australians, we have seen that there is an effect for age (Young Adult Anglos favour *be going to* compared to Adult Anglos), and for social class in interaction with age and with gender (Adult MC and MC men disfavour *be going to*). Despite this, the linguistic conditioning is shared by both the Adults and Young Adults, indicating that there has been no change in the variable grammar over time, consistent with the advanced nature of this change. Nevertheless, the Young Adult Anglos do have a higher rate of *be going to* than the Adult Anglos. So why might the Middle-Class Adults and Middle-Class men be lagging in this change, with a lower rate of *be going to*? I interpret this as an artefact of the sense of standard language use and formality that has been ascribed to *will* in Australian English, making this form more attractive to these groups (similar arguments regarding the association between will and formality in other varieties, see Berglund, 2000, p. 34; Mair, 1997, p. 1538).

5.6.2 Across ethnicity: Anglo vs. Chinese Young Adults

While Young Adult Anglos show a greater favouring of *be going to* than the Adults, we observed that in Figure 25, the Young Adult Chinese Australians use *be going to* at a similar rate to the Adults. While this suggests that Chinese Australians may be lagging in this change, it is crucial to consider the socioeconomic class patterns we observed among Anglo Australians. Specifically, we must take into account that MC Adults and MC Men are lagging in the shift toward increased usage of *be going to*. As the Chinese have a limited class distribution (comprising only MC and LMC), this class difference may skew the results if we

were to compare the Chinese Australians with all the Anglo Australians. For *the*+VOWEL, it was found that the Chinese Australians align with their MC Anglo peers in using a higher rate of schwa. Here, is the class patterning evident in the speech of the Anglos also having an effect on the English of the Chinese Australians? As previously, I remove the WC Anglos to make the samples across ethnicity comparable. This resulted in 7 Young Adult WC Anglos being set aside, and the exclusion of 164 tokens. Subsequently, I conducted regression analyses on the 570 tokens from the remaining 19 Young Adult Anglos and 22 Chinese Australians, making a two-way distinction between MC and LMC.

In the comparison between Young Adult Anglo and Chinese Australians, I employed the same regression model that was used for the Anglo Australians (as in Table 12). As suggested by the conditional inference tree, I included a two-way interaction, Ethnicity * Class. Since a significant interaction between Class and Gender was found in the apparent-time analysis of the Anglo Australians, I also incorporated it here. Furthermore, to assess whether there are differences in the variable grammar of future temporal reference between Anglo and Chinese Australians, I included a three-way interaction, Ethnicity * Clause * Polarity, and two-way interactions between Ethnicity and each of the linguistic factors, including Subject and Adverbial. Therefore, the maximal model comprised one three-way interaction (Ethnicity * Clause * Polarity) and four two-way interactions (Ethnicity * Class, Class * Gender, Ethnicity * Subject, Ethnicity * Adverbial). Subsequently, I followed a backward elimination procedure to streamline the model, retaining only the significant effects, as explained earlier.

The final model predicting the variation between *be going to* and *will* is summarised in Table 13[19]. Class and Gender do not exhibit any main or interaction effects. This differs from the model above that only includes the Anglos, where there is an interaction between Class and Gender, with MC men favouring *will* over *be going to*. The absence of significant effects related to Class and Gender here suggests that the interaction between these two factors in the preceding analysis is primarily driven by the Adults, and while the Young Adults may trend in the same direction, these effects would appear to have diminished over time. This is evident in Figure 36 where Class differentiation applies to the Adults only.

[19] Formula: glmer(Realisation ~ Ethnicity + Subject + Clause * Polarity + (1|Speaker))

For this analysis, Ethnicity shows a main effect. There were no significant interactions between Ethnicity and any linguistic factor, suggesting that, despite the higher overall rate of use of *be going to* by Young Adult Anglos, the variable grammar of future temporal reference is shared between the Chinese and their Anglo counterparts. As shown in Figure 38, the significant main effect of Ethnicity confirms that Young Adult Anglos favour *be going to* over the Chinese. This observation aligns with the differences in usage rates between these two young adult groups depicted in Figure 25, which are consistent across both the conditional inference tree, shown in Figure 34 and the regression model.

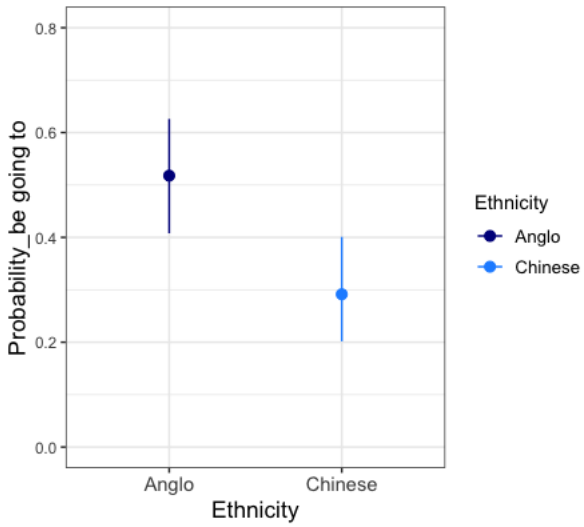
Table 13 Model summary for the regression on the realisation of *be going to* (vs. *will)* for Young Adult Anglo and Chinese Australians.

	Estimate	Std. Error	z value	Sig.
Intercept	-0.64	0.26	-2.47	<0.05
Ethnicity$_{\text{Anglo vs. }\textbf{Chinese}}$	-0.96	0.34	-2.85	<0.01
Subject$_{\text{First vs. }\textbf{Other}}$	0.71	0.20	3.51	<0.001
Clause$_{\text{Main vs. }\textbf{Subordinate}}$	0.75	0.24	3.17	<0.01
Polarity$_{\text{Positive vs. }\textbf{Negative}}$	1.14	0.30	3.84	<0.001
Clause$_{\text{Main vs. }\textbf{Subordinate}}$: Polarity$_{\text{Positive vs. }\textbf{Negative}}$	-1.33	0.59	-2.24	<0.05

For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of *be going to*.

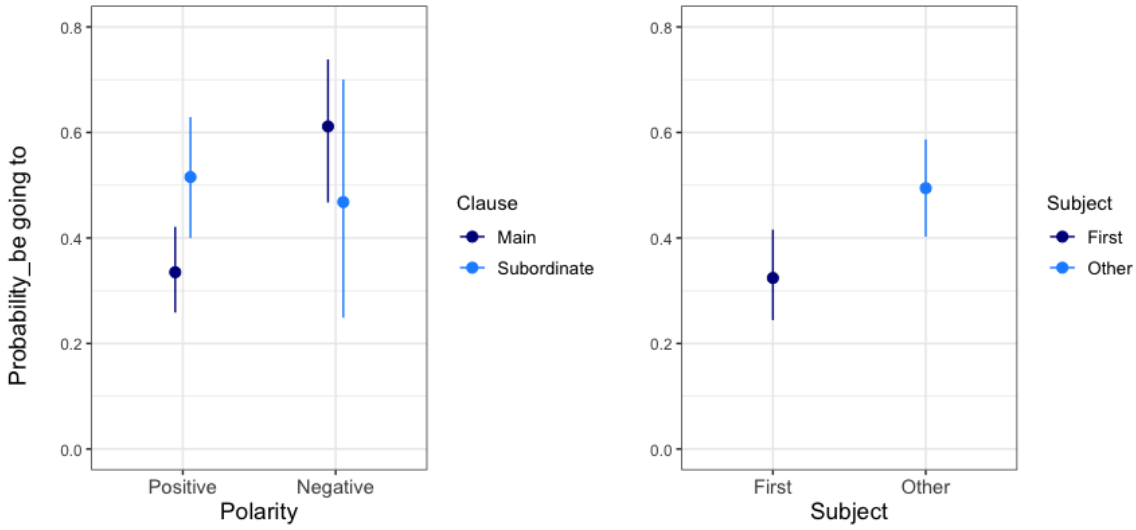
Overall rate of *be going to* is 42% (241/570). N Speakers = 36, Speaker variance = 0.596 (*SD* = 0.772); Log likelihood: -346.7; AIC: 707.3; BIC: 737.7. No significant effects for Gender, Class, and Adverbial.

Figure 38 Effect plot of Ethnicity for *be going to* (vs. *will*) for Young Adult Anglo and Chinese Australians.



Among the linguistic factors, the interaction between Clause and Polarity found for the Anglos overall is retained, as depicted in Figure 39. The significant interaction between Clause and Polarity (as shown in the left panel) indicates that the highest rate of *be going to* occurs in main clauses with negative polarity. Additionally, there is an exclusive clause effect observed with positive polarity only, where *be going to* is favoured in subordinate clauses. These patterns mirror those in Table 12 for both age groups of Anglo Australians. The main effect of Subject (right panel) indicates that there is a strong favouring of *be going to* with non-first person subjects, also as seen above.

Figure 39 Effect plots of the interaction between Clause and Polarity and the main effect of Subject for *be going to* (vs. *will*) for Young Adult Anglo and Chinese Australians.



In summary, Young Adult Anglos exhibit a significantly higher rate of *be going to* usage compared to Adult Anglos, while the Chinese participants do not. However, despite this usage difference, the variable system of future temporal reference remains shared among these three Australian groups. This shared system suggests that the higher rate of *be going to* among Young Adult Anglos is accompanied by minimal grammatical change. These differences in usage may be driven by social conditioning, particularly the intersection of social class and gender. Notably, a class effect is observed among Adult Anglos, where MC speakers tend to disfavour *be going to*. However, this class effect has diminished over time, as neither Young Adult Anglos nor the Chinese participants exhibit a significant class effect. Moreover, there is an interaction between gender and class, with MC men disfavouring *be going to*. This disassociation between MC and *be going to* may contribute to the lower overall rate of *be going to* among the Chinese participants.

In the previous chapter on *the*+VOWEL, it was observed that among Young Adult Anglos, a class differentiation exists between MC and LMC speakers, with the former displaying a preference for the newer variant schwa over the latter, and with both class groups for the Chinese patterning like their MC Anglo peers in using a higher rate of schwa. This suggests the Chinese Australians' alignment with a MC orientation, denoting a community with elevated socio-economic standing in Australia. Contrastingly, regarding future temporal reference, there appears to be no distinct class effect among Young Adult Anglos. Instead, the observed class effect was only noticeable among the previous generation, where the MC Adults showed a preference for *will*. Therefore, the Chinese may be sensitive to the class effect in the previous age group, favouring *will* due to its association with formality, a trend maintained by Adult Anglos.

5.6.3 Assessing ethnic orientation of the Chinese

We have seen that there is a main effect of ethnicity, with the Chinese Australians exhibiting a significantly higher rate of using *will* than the Anglo Australians (Table 13 above). The linguistic conditioning, however, is shared as seen in the lack of any significant interactions. This finding prompts the question of whether the differences in usage rates among the Chinese are a reflection of their identity, similar to what has been proposed for the Italians and Chinese in Canada (Hoffman & Walker, 2010).

To investigate this, further regression models were conducted, this time including only the Chinese Australians. The model is based on what we have observed for the Young Adults, but

instead of ethnicity, includes measures of orientation to the ethnic heritage. Thus, four independent models were carried out, one for each of the four measures: ethnic orientation index, social network, self-reported Cantonese proficiency, and Cantonese-speaking density in the suburb (cf., Section 3.2). Furthermore, the main effects of social factors—class and gender—as well as the main effect of the linguistic predictor, subject, were examined. Additionally, the interaction between clause type and polarity was also considered.

The results of the final models are summarised in Table 14. Most importantly, none of the measures of ethnic background have a significant effect. Thus, the ethnic difference seen in Table 13 holds across the Chinese community in Australia. This absence of an effect in these measures indicates a sense of homogeneity within the Chinese community regarding their ethnic orientation towards Chinese heritage and culture, aligning with the distributions highlighted in Section 3.2.2 above.

For the other predictors, as presented in Table 14, gender demonstrates no significant effect, which aligns with the results observed in the model that encompasses both Young Adult Anglos and Chinese above. The only significant effect in the model is the main effect of subject, revealing a favouring for *be going to* in non-first person subjects compared to first person subjects, as has been found in Section 5.6.2. However, neither the interaction effect between clause type and polarity nor their individual main effects achieve significance in this analysis. These findings suggest a potential insufficiency in the number of instances to support the emergence of these effects when considering only the Chinese dataset.

Table 14 Model summary for the regression on the realisation of *be going to* (vs. *will*) for Chinese Australians.

	Estimate	Std. Error	z value	Sig.
Intercept	-1.24	0.29	-4.20	<0.001
Subject$_{\text{First vs. }\mathbf{Other}}$	0.76	0.31	2.48	<0.05

For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of *be going to*.

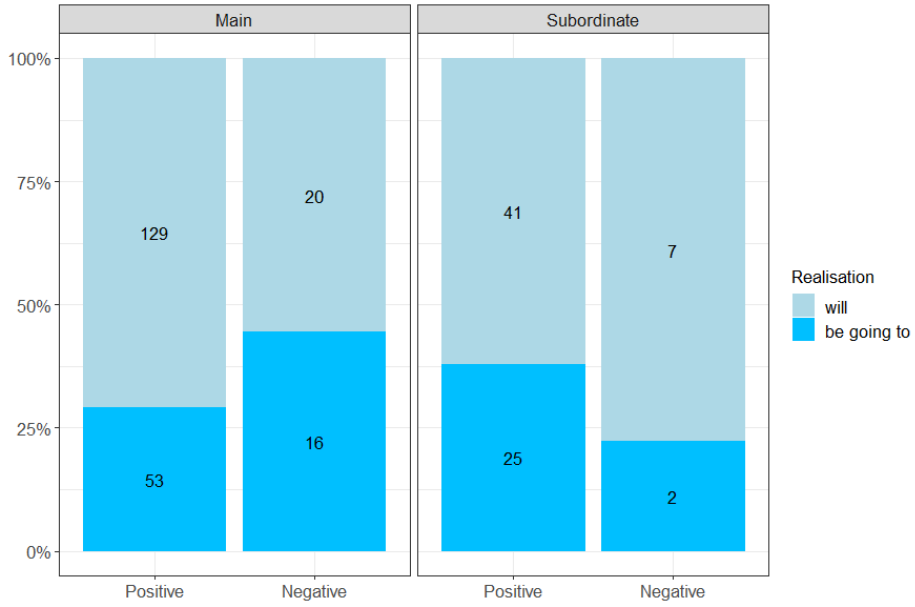
Overall rate of *be going to* is 34% (85/253). N Speakers = 17, Speaker variance = 0.425 (*SD* = 0.652); Log likelihood: -154.7; AIC: 315.4; BIC: 326.0. No significant effects for Gender, Class, EOI, Social Network, Cantonese Proficiency, Cantonese-speaking Density in the Suburb, Polarity, and Clause Type.

In Section 5.6.2, when examining both Young Adult Anglo and Chinese Australians, an interaction effect between clause and polarity was observed. To confirm the uniformity of

variable grammar for both groups, as argued previously, I display the cross-tabulation of the distribution between these two factors in Figure 40, because the token count within the Chinese dataset alone might not be sufficient to allow for the emergence of this interaction in the regression model.

As can be seen, the highest rate of *be going to* is observed in main clauses within negative polarity contexts. Conversely, in positive polarity contexts, a higher rate of *be going to* is noted in subordinate clauses compared to main clauses. These observed patterns align with the trends seen in the left panel of Figure 39, reinforcing the previous conclusion that the variable grammar is indeed shared between Young Adult Anglos and Chinese.

Figure 40 Cross-tabulation of the Polarity and ClauseType distribution for *be going to* (vs. *will*) for Chinese Australians.



5.6.4 Hong Kong English

The ethnic differences raise the further question of whether there may be an effect of language transfer from Cantonese. If this were the case, we might have expected there to be an effect in the previous model for language proficiency. But in order to interpret this lack of an effect, we need to understand just how language transfer from Cantonese might manifest in English future temporal reference.

We may expect transfer to play a role at least in Hong Kong because, as discussed in Section 5.1.2, future temporal reference is not obligatory in Cantonese, but is variably expressed by adverbs, the auxiliary *wúih* 'will/would', or nothing at all. The presence of the auxiliary *wúih* in Cantonese may lead to a greater use of *will*, while the use of adverbs in Cantonese might result in a differential effect for adverbs. We also note that as illustrated in Figure 25, the rate of *will* usage is the highest in Hong Kong English, encompassing both variable and non-variable speakers, at 84%, and even only considering variable speakers (see Table 11), it is still 65%. On one hand, this difference may stem from the more formal nature of the ICE-HK conversations. On the other hand, given the bilingual nature of these speakers, this difference may be attributed to a language transfer effect from Cantonese. To investigate the potential substrate transfer effects, I now examine the linguistic patterns in Hong Kong English and compare them to those in Australian English.

To compare linguistic patterns between Hong Kong English and Australian English, I examined identical linguistic factors in both contexts. Since Gender is the only social factor in ICE-HK, I explored its interactions with all the linguistic factors. The maximal model here included Gender * (Clause * Polarity + Subject + Adverbial).

The final model is summarised in Table 15[20]. Much like the findings from the conditional inference tree, Gender has no significant effect, neither as a main effect nor in interaction with any linguistic factor. Furthermore, in line with the conditional inference tree results, there is no main effect of Subject, nor is there an interaction effect between Clause and Polarity. However, a significant main effect of Clause is observed, indicating a preference for *be going to* with subordinate clauses over main clauses in Hong Kong English. Different from Australian English, a significant effect of Adverbial is evident in Hong Kong English. To aid in the interpretation of these effects, they are visualised below.

[20] Formula: glmer(Realisation ~ Clause + Adverbial + (1|Speaker))

Table 15 Model summary for the regression on the realisation of *be going to* (vs. *will*) in Hong Kong English.

	Estimate	Std. Error	z value	Sig.
Intercept	-0.64	0.21	-3.02	<0.01
Clause$_{\text{Main vs. }\mathbf{Subordinate}}$	0.71	0.30	2.34	<0.05
Adverbial$_{\text{No Adv vs. }\mathbf{Non\text{-}Specific\ Temporal\ Adv.}}$	-1.76	0.51	-3.43	<0.001
Adverbial$_{\text{No Adv vs. }\mathbf{Specific\ Temporal\ Adv.}}$	0.25	0.39	0.65	0.519

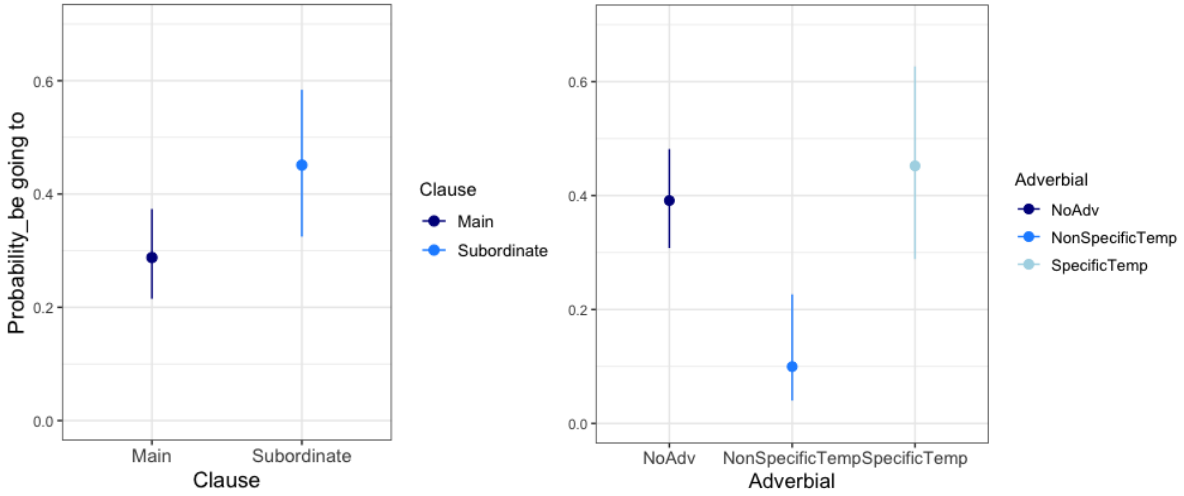
For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of *be going to*.

Overall rate of *be going to* is 35% (97/277). N Speakers = 35, Speaker variance = 0.287 (*SD* = 0.535); Log likelihood: -165.5; AIC: 340.9; BIC: 359.0. No significant effects for Gender, Subject, and Polarity.

In the left panel of Figure 41, we observe that *be going to* is favoured with subordinate clauses over main clauses in Hong Kong English. However, in Australian English, *be going to* is favoured with subordinate clauses only in positive polarity. The clause effect is neutralised in negative polarity, which overall favours *be going to*. Such an effect appears to be absent in Hong Kong English, though we do note it may not emerge due to the limited number of tokens with negative polarity (n = 35; 25 in main and 10 in subordinate clauses).

As illustrated in the right panel of Figure 41, in Hong Kong English, *be going to* is disfavoured in contexts with non-specific temporal adverbials compared with specific temporal adverbials or those without adverbials. This differs from that in Australian English. In the Australian English data, not only is there no significant effect for Adverbials, but the direction of the effect is also distinct with *be going to* most favoured in contexts with no adverbials, while contexts with specific and non-specific temporal adverbials exhibit similar patterns.

Figure 41 Effect plots of Adverbial and Clause for *be going to* (vs. *will*) in Hong Kong English.



In summary, we observe different tendencies in linguistic factors between Australian English and Hong Kong English, indicating that these varieties have different variable grammars. The most prominent linguistic factor that distinguishes Hong Kong English from Australian English is Adverbial. This is precisely where we predicted that transfer effects may be observed, given the use of Adverbials in Cantonese to express future temporal reference. A comprehensive investigation into the variable grammar of future temporal reference in Cantonese is necessary to understand this phenomenon, which is beyond the scope of my thesis. This is nevertheless suggestive of how contact effects may be manifest, and it is clear that the Chinese Australians do not exhibit any such effect, instead, patterning similarly to the Anglo Australians in showing no significant effect of adverbial usage. We therefore find no evidence that the patterning of *be going to* among Chinese Australians is attributable to language transfer.

5.7 Discussion and conclusion

We have seen that Chinese Australians employ *be going to* at a much lower rate than their Anglo Australian peers (33% vs. 49% respectively). Their *be going to* rate is similar to that of Adult Anglo Australians (35%), and to the rate in ICE-HK, once the non-variable speakers are excluded (35%) (though the overall rate is lower, at 16%), as shown in Figure 25 and Table 11. This observation suggests some parallels, at least in usage rates, between Chinese Australians and the speakers in ICE-HK.

The regression model shows that ethnicity has a significant main effect, indicating that Chinese Australians have a lower rate of *be going to* or a higher rate of *will*. However, upon examining

the four measures of ethnic background among Chinese Australians, none exhibit a significant effect in the regression models. This suggests that Chinese Australians pattern as a group, with little evidence of ethnically driven variability among them. Furthermore, when examining the linguistic conditioning in Australian English and Hong Kong English, it becomes apparent that Chinese Australians align more closely with Anglo Australians and diverge from the patterns observed in Hong Kong English. These observations suggest that the variable grammar of future temporal reference is shared between Anglo and Chinese Australians but differs between Australian English and Hong Kong English. When considering Hong Kong English as a benchmark, these distinctions between the two varieties indicate that language transfer does not contribute to different patterns in the English of Chinese Australians.

In their analysis of Chinese and Italian Canadians in Toronto, Hoffman and Walker (2010, p. 53) similarly observed shared conditioning despite differences in usage rates for t/d deletion and Canadian Vowel Shift. They found a correlation between rates of use and ethnic orientation, leading them to propose that rates of use serve to mark ethnic identity. Thus, I will explore further a possible role for ethnic orientation in Chapter 7 by employing correlation tests.

For the social conditioning, there is no class effect for the Young Adult Anglos, but we saw that MC Adult Anglos and MC Men favour *will*. In the previous chapter, we saw an alignment between the Chinese Australians and their MC Anglo counterparts in favouring schwa. Thus, why would the Chinese favour *will*? I interpret this as a general orientation to the previous generation's class effect, which itself is tied to the perceived conservatism and formality of *will* (Berglund, 2000; Engel & Szmrecsanyi, 2023).

As one further exploration of this class effect, in the final analysis chapter, I will consider a linguistic variable that has been undergoing change for many centuries – existential *there's* + plural argument. Historically, the singular form THERE'S has been considered a non-standard variant in prescriptive grammar, often associated with the working class (see Meechan & Foley, 1994, p. 65; Tagliamonte, 1998, p. 157 for their reviews). However, recent research indicates that the social meaning of this variant has shifted, no longer connoting non-standardness and working class norms (Hilton, 2018, p. 233; Krejci & Hilton, 2017, p. 187). Therefore, analysing this variable will provide further insight into the effects related to gender and class and their potential intersection with ethnicity.

Chapter 6 Existential *there's* + Plural Argument

6.1 Introduction

The variable realisation of existential *there* constructions with plural arguments has long been a feature of English, dating back to 1000 A.D. in Old English (Quirk & Greenbaum, 1957, p. 76; Traugott, 1972, p. 134). Today, it is one of the variable grammatical features shared across varieties of English (Britain & Sudbury, 2002, p. 213; Chambers, 2003, p. 130), including American English (Krejci & Hilton, 2017; Riordan, 2007), Australian English (Eisikovits, 1991; El-Khaissi, 2017), British English (Rupp, 2005; Tagliamonte & Baayen, 2012), Canadian English (Meechan & Foley, 1994; Walker, 2007, 2021), and New Zealand English (Britain & Sudbury, 2002; Hay & Schreier, 2004).

In plural *there* existentials, the verb varies between plural (46) and singular morphology (47) (Dixon, 1977, p. 600), and this variability occurs in the contexts of both present tense and past tense (48). In the present tense context, the verb is commonly contracted – *there's* (49). In this study, I use (THERE'S) in parentheses to represent the variable realisation of *there* + *be* + plural arguments; capitalised THERE'S to represent the singular form (including *there's/there is/there was*) which is contrasted with THERE ARE for the plural (including *there're/there are/there were*) (e.g. Britain & Sudbury, 2002); and lower case *there's* to refer specifically to the contracted form.

Variable realisation of existential constructions with plural arguments

(46) Present tense plural:

There are *a lot of Asians @there.*

(SydS_CYM_030_Stuart)

(47) Present tense singular:

like ***there is*** *a lot of cultures.*

(SydS_CYF_047_Melissa)

(48) Past tense singular:

There was *actually a lot of Australians.*

(SydS_AYF_092_Kylie)

(49) Contracted:
There's *lots of great markets.*

(SydS_AYF_092_Kylie)

Lack of agreement in plural existentials is predominant in almost all varieties of English, with *there's* being the most frequent variant (e.g., Britain & Sudbury, 2002; Eisikovits, 1991; Krejci & Hilton, 2017; Walker, 2007). For instance, one study found that in Toronto English in Canada, 72% of the plural existentials were realised with the singular form, and the contracted *there's* was the most frequent variant, occupying 55% of total tokens (Walker, 2015, p. 11). It has been argued that *there's* has become "the default choice" (e.g., Breivik & Martinez Insua, 2008, p. 358; Martinez Insua & Palacios Martinez, 2003, p. 264; Quirk, Greenbaum, Leech, & Svartvik, 1985, p. 756) or "an unanalysed formulaic chunk" (Crawford, 2005, p. 35), or even "an invariant form" (Cheshire & Fox, 2009, p. 33) of plural existentials in spontaneous speech due to lexicalisation and subjectification, which entails the "pragmatic strengthening" of its own set of constraints (Breivik & Martinez Insua, 2008, p. 359).

The singular form THERE'S tends to be highly frequent in spoken language data (Crawford, 2005, p. 42; Martinez Insua & Palacios Martinez, 2003, p. 268; Smallwood, 1997), especially in more casual speech styles (Biber, Johansson, Leech et al., 1999, p. 186; Givón, 1993, p. 207). Riordan (2007) looked at (THERE'S) in the Michigan Corpus of Academic Spoken English whose genre was more formal than private conversations and sociolinguistic interviews. He found that overall, only 40% of (THERE'S) were of the singular form, which was lower than the rate observed in less formal genres (Riordan, 2007, p. 252). Notably, THERE'S only occupied 25% of all variable (THERE'S) instances in monologues but 53% in panel discussions (Riordan, 2007, p. 259), indicating a higher frequency of THERE'S in more casual and informal speech.

Furthermore, the increase of THERE'S, in particular, the contracted form, *there's*, is an ongoing change led by younger speakers, and its social meaning is becoming less marked (Krejci & Hilton, 2017; Walker, 2021). Younger speakers are leading the way in adopting the contracted form *there's* as "an informal standard norm" (Wolfram, Hazen, & Schilling-Estes, 1999, p. 63), which is now "moving into the standard dialect" (Squires, 2011, p. 48) and is considered "a relatively standard form in spoken English" in the United States (Krejci & Hilton, 2017, p. 196). Perception studies have provided further evidence that *there's* is becoming more socially accepted over time in the United States and "appears to lack any social stigma, even among listeners who describe themselves as very bothered by nonstandard language use" (Hilton, 2018, p. 233).

In the case of Australia, is the variable use of plural existentials subject to social stratification? Eisikovits (1991, p. 243) examined (THERE'S) in the speech of young speakers from working class families (13-16 years old) in Sydney and found that the singular form, THERE'S, was almost exclusively used, with a rate of 95%. El-Khaissi (2017) analysed data from the Sydney Social Dialect Survey, collected in the 1970s (Horvath, 1985), and found that the working class Anglo Adults used THERE'S at the highest rate (91%), followed by teenagers (70%). The findings from both studies suggest that (THERE'S) is an advanced change in Australian English and working class speakers tend to use a very high rate of THERE'S. However, since the data of both studies were collected over 40 years ago, it is worth exploring the current status of (THERE'S) in Australian English. This chapter examines whether (THERE'S) is undergoing an apparent time change in Australian English. Additionally, it examines speakers from different socioeconomic and ethnic backgrounds to test for potential social and ethnic variation in the use of (THERE'S).

6.2 Literature review

6.2.1 THERE'S: *there's* vs. *there is/was*

Before delving into the prior research, it is important to note that the contracted form, *there's*, has been treated differently in various studies, making it difficult to compare across them. Specifically, as the most frequent variant in many varieties of English, *there's* has been argued to be the default choice of plural existentials as "an invariant form" as a result of lexicalisation (Cheshire & Fox, 2009, p. 33; see also Martinez Insua & Palacios Martinez, 2003). Therefore, Walker (2015, p. 10) hypothesised that the set of constraints of *there's* would be different from that of non-contracted *there is/was* if it is a lexical variant, but would show similar conditioning if it is a grammatical variant. To test this, he compared the conditioning of *there's* vs. all other variants and *there is/was* vs. *there're/there are/were* (excluding *there's* here) in Canadian English and indeed found differences in the effects of tense and determiner type. As a result, he concluded that *there's* is a separate variant of (THERE'S) (see also Walker, 2007; 2021 for similar findings).

Krejci and Hilton (2017) further hypothesised that *there's* and *there is/was* are on different longitudinal trajectories in Californian English. To test this, they ran a multinominal regression model where the dependent variable included three levels (contracted *there's* vs. singular *there is/was* vs. plural *there're/there are/were*). The results showed that *there's* is becoming more frequent over time, while *there is/was* is not (Krejci & Hilton, 2017, p. 196), supporting the

hypothesis that these two variants are on different longitudinal trajectories. Moreover, these three variants are conditioned by different linguistic factors. They found that *there are/were* and the most frequent variant *there's* "pattern together and are conditioned by the same linguistic factors in the same direction", such that both variants are favoured in clauses with affirmative polarity and indefinite determiners, while *there is/was* is favoured in clauses with negative polarity and definite determiners (Krejci & Hilton, 2017, p. 194).

In a perception study of the social evaluations of the three main variants of (THERE'S), namely, *there's*, *there is* and *there are*, Hilton (2018, p. 239) found that "speakers who used *there is* were rated as significantly less educated, intelligent, and articulate, and less likely to be from a wealthy or middle-class background. However, for each of these five attributes, there was no significant difference between guises with *there's* and *there are*". These patterns held regardless of participants' attitudes toward nonstandard language use. Thus, *there's* is "more standard", "more socially accepted and unmarked" than *there is* and they are sociolinguistically distinct variants of (THERE'S) (Hilton, 2018, p. 246).

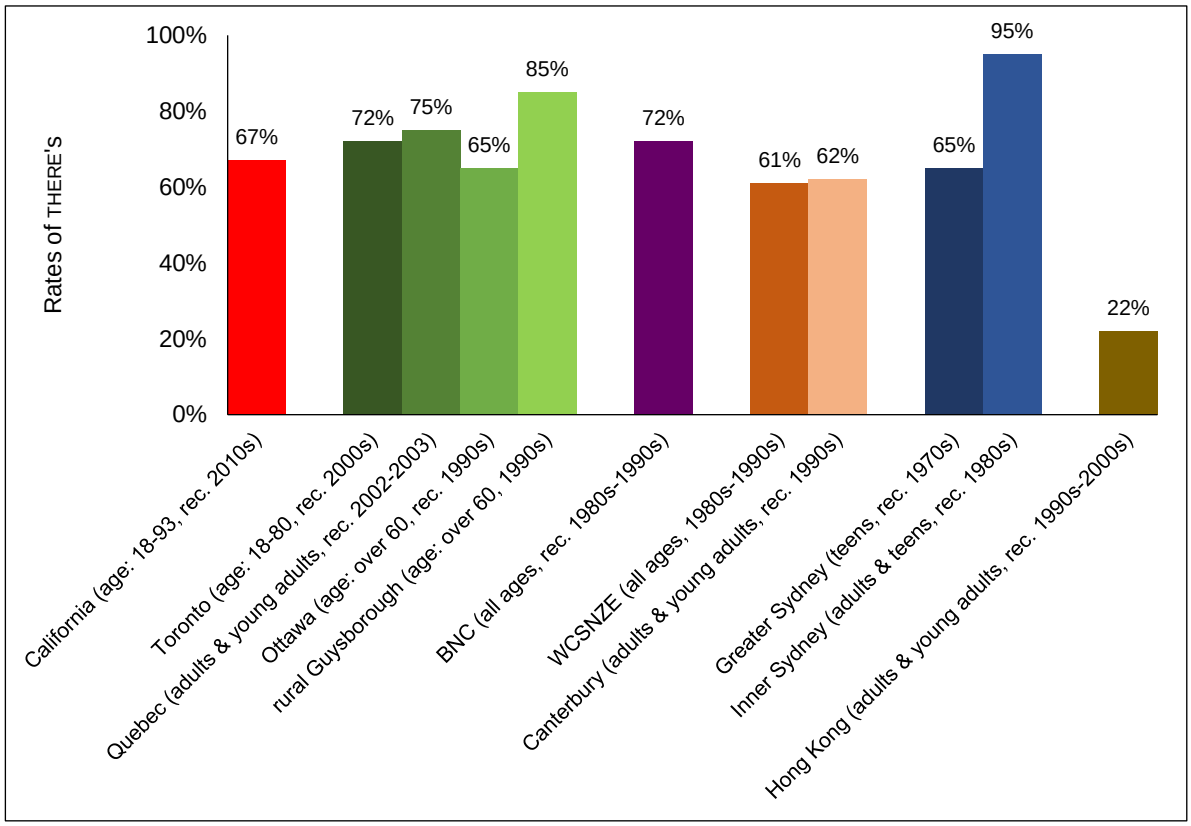
Despite seeming theoretically sensible to treat *there's* as distinct from *there is* in the analysis, in studies that reported the rate of *there is*, it was very low. In Californian English, *there is* occupied only 1% of (THERE'S) (34/2,544) (Krejci & Hilton, 2017, p. 192). In the Michigan Corpus of Academic Spoken English, there were only 11 tokens of *there is* among all tokens of (THERE'S) (0.7%, 11/1,520) (Riordan, 2007, p. 252). In New Zealand English, only 4 tokens of *there is* among all tokens of (THERE'S) were found by Hay and Schreier (2004, p. 219) (0.4%, 4/1,028). Similarly, there are only 6 tokens of *there is* among all tokens of (THERE'S) in the Sydney Speaks corpus (1%, 6/601) and 11 tokens in ICE-HK (6%, 11/196). Therefore, the distribution of the data here does not allow for the inclusion of *there is* as a separate category. I will consider *there's/there is/was* vs. *there're/there are/were* to test the differences between singular morphology THERE'S and plural morphology THERE ARE in terms of conditioning, as has been done in most other studies (Britain & Sudbury, 2002; Collins, 2012; El-Khaissi, 2017; Hay & Schreier, 2004; Meechan & Foley, 1994; Riordan, 2007).

6.2.2 Timing of the change of (THERE'S) across varieties of English

Empirical studies of spoken language data have revealed differences in the rates of THERE'S vs. THERE ARE across varieties of English. Figure 42 displays the rates of use in six different varieties of English, where the contracted form *there's* and non-contracted forms *there is/was* have been combined from studies that looked at these two variants separately (Krejci & Hilton,

2017; Walker, 2015). The horizontal axis represents the specific names of the corpus or variety and the year of recording, and the vertical axis shows the rate of THERE'S relative to THERE ARE.

Figure 42 Rates of THERE'S (vs. THERE ARE) across varieties of English.



Notes. California, US (Krejci & Hilton, 2017, p. 192), Toronto and Quebec, Canada (Walker, 2015, p. 11), Ottawa and rural Guysborough, Canada (Meechan & Foley, 1994, pp. 76-77), BNC (British National Corpus)-spoken component, UK (Martinez Insua & Palacios Martinez, 2003, p. 273), Canterbury Corpus, New Zealand (Hay & Schreier, 2004, p. 216), WCSNZE (The Wellington Corpus of Spoken New Zealand English), New Zealand (Britain & Sudbury, 2002, p. 217), Inner Sydney, Australia (Eisikovits, 1991, p. 243), Greater Sydney, Australia (El-Khaissi, 2017), ICE-HK, Hong Kong (Collins, 2012, p. 63).

As can be seen, the singular form THERE'S is more frequent than the plural THERE ARE in almost every variety (except Hong Kong English). In Californian English, the overall usage rate of THERE'S is 67% (Krejci & Hilton, 2017, p. 190). An apparent time shift in usage toward THERE'S over THERE ARE was observed among younger speakers (p. 193). In Canadian English, regional variation in (THERE'S) exists, ranging from 85% in rural Guysborough English to 65%

in Ottawa English (Meechan & Foley, 1994, p. 70), with Toronto English (72%) and Quebec English (75%) in between (Walker, 2015, p. 11).

In British English, the rate of THERE'S was 72% in the spoken component of British National Corpus (BNC) (Martinez Insua & Palacios Martinez, 2003, p. 273). In New Zealand, the rates of THERE'S in the Wellington Corpus of Spoken New Zealand English and the Canterbury Corpus were very similar, at 61% and 62%, respectively (Britain & Sudbury, 2002, p. 217; Hay & Schreier, 2004, p. 216). In the analysis conducted by Britain and Sudbury (2002, p. 219), it was found that the young speakers of New Zealand English used a higher rate of THERE'S than the older speakers, suggesting an apparent-time increase in the singular form.

The highest rate of THERE'S was found in Inner Sydney English during the 1980s among Teens, reaching 95% (Eisikovits, 1991, p. 236). In an apparent-time analysis of (THERE'S) involving both Adults and Teens in the Sydney Social Dialect Survey (SSDS) conducted in the 1970s, the overall usage rate of THERE'S was lower at 65% (El-Khaissi, 2017). However, as shown in Table 16, Adults (age: >35) were found to use THERE'S at a rate of just 38%, while Teens (age: <18) nearly doubled that rate at 70%. These results indicated that (THERE'S) was undergoing a change, with a higher prevalence in Australian English during the 1970s (El-Khaissi, 2017). It is noticeable that there was a strong class effect for the Adults, with the working class speakers favouring THERE'S. This class stratification was attenuated over time as the three class groups of Teens used similar rates of THERE'S. For the lower middle and middle class speakers in both age groups, they used similar rates of THERE'S. In the data recorded by Eisikovits (1991) in the 1980s, only the working class Teens were included, which may account for the very high rate of THERE'S, at 95% (p. 243). The lowest rate of THERE'S was found in Hong Kong English at 22% (Collins, 2012, p. 63).

Table 16 Distribution of THERE'S (vs. THERE ARE) by age, gender and class in SSDS.

Factors	Subfactors	Adult (age: >35) (n = 101, 38% THERE'S)		Teen (age: < 18) (n = 505, 70% THERE'S)	
		N	% THERE'S	N	% THERE'S
Gender	Women	61	36%	252	71%
	Men	40	40%	253	69%
Class	Working	22	91%	196	73%
	Lower Middle	32	25%	155	70%
	Middle	47	21%	154	66%

In summary, there is a lot of variability in the rates of THERE'S across different varieties of English. Generally, THERE'S is found at rates ranging between 61% and 95% (except Hong Kong English), with the highest rates observed in the most recent data. This suggests that (THERE'S) tends to be an advanced linguistic change in many varieties, with an average rate of approximately 72%. Additionally, several studies have noted a preference for THERE'S among younger speakers, indicating an ongoing linguistic change (Krejci & Hilton, 2017; Smallwood, 1997; Starks & Thompson, 2009; Walker, 2021).

6.2.3 Social conditioning: gender, class and ethnicity

In the previous section, I have established an ongoing change involving an increase in THERE'S at the expense of THERE ARE across varieties. What is the role of social factors in this change, such as gender, class, and ethnicity?

The class effect has been consistently found, with the working class or less educated speakers using a higher rate of THERE'S in different varieties of English (e.g., Feagin (1979) on Alabama English; DeWolf (1992) on Canadian English; Eisikovits (1991, p. 245) and El-Khaissi (2017) on Australian English; Hay and Schreier (2004, p. 216) on New Zealand English; Britain and Sudbury (2002, p. 219) on both New Zealand English and Falkland Island English). Specifically, Meechan and Foley (1994) found that speakers with less than 11 years of education favoured THERE'S, indicating that THERE'S was associated with "attendance at high school" (p. 82). Similarly, Britain and Sudbury (2002, p. 219) found that speakers with education beyond 16 but below tertiary favoured THERE'S in New Zealand English. This has also been observed in the US, with THERE'S being more frequently used by speakers with less formal education (Krejci & Hilton, 2017, p. 194). Moreover, in New Zealand, Hay and Schreier (2004, p. 216) observed that non-professional speakers showed a markedly higher rate of THERE'S relative to professional speakers. Another noticeable finding is that the THERE'S variant was nearly categorical among working class teenagers in Australian English (overall 95%), with 30 of the 40 working class teens exclusively using THERE'S (Eisikovits, 1991, p. 244), indicative of the strong association between THERE'S and the working class (similar to what was reported by El-Khaissi, 2017).

Despite the working class associations of THERE'S, findings for gender appear to be less consistent (cf., Krejci & Hilton, 2017, p. 193; Riordan, 2007, p. 258). For instance, Hay and Schreier (2004, p. 216) found that in New Zealand, women used a higher rate of THERE'S than men. However, it was only the case for speakers of New Zealand English during the late 19th

century and not for the former and later speakers who do not show a gender effect (Hay & Schreier, 2004, p. 216). Thus, the gender effect was not consistent over time in New Zealand. Interestingly, the interaction effect between age and gender was found in different varieties of English, and younger women were found to be leading the increase of THERE'S. Specifically, in American English, younger women were more likely to produce THERE'S than men (Riordan, 2007, p. 259). A similar interaction effect was also found in York in the UK, where younger women were "rapidly moving [THERE'S] to categorical status" (Tagliamonte, 1998, p. 182). Eisikovits (1991) also found such an intersection in working class adolescent Sydney English, but the direction of effect changes for age – among the older children (of around 16 years old), the boys favoured THERE'S more than the girls (92% vs. 83%), but the opposite was true for the younger speakers (of around 13 years old) (81% for the boys vs. 96% for the girls). This suggested that "as the girls grow older and become more conscious of external norms of 'correctness', they modify their usage in line with this perception" (Eisikovits, 1991, p. 253) while increased age brought a different social meaning to the boys, "perhaps a strengthening of working-class values", so the older boys used more THERE'S (p. 245). But overall, when a significant gender effect was found, younger women tended to favour THERE'S in different varieties of English.

Of particular interest here is the effect of ethnicity, which has not been widely examined. One study that compared across ethnic groups observed that Māori in New Zealand used a higher rate of THERE'S than Pākehā or New Zealanders of European background (Britain & Sudbury, 2002, p. 219). Another study of (THERE'S) by the British/Irish, Italian, and Chinese Canadians found that the second-generation Italian Canadians used a higher rate of THERE'S than both the Chinese and British/Irish Canadians, suggesting that the second-generation Italians in Canada were leading this change (Walker, 2021, p. 171). This difference in rate of use across ethnic groups in Canada was not attributable to language transfer. Based on the typological differences between the heritage languages, language transfer might be evident in higher rates of THERE ARE by the Italians, and lower rates by the Chinese, but the reverse was the case here (Walker, 2021, p. 178).

In summary, THERE'S has been found to be associated with informal speech, young and working class speakers (Britain & Sudbury, 2002; Crawford, 2005; El-Khaissi, 2017; Krejci & Hilton, 2017), but with little effect for gender (see findings in Krejci & Hilton, 2017; Riordan, 2007). Studies examining the ethnic conditioning of (THERE'S) have identified specific ethnic groups leading the increase in the usage of its singular form, such as Māori in New Zealand

(Britain & Sudbury, 2002, p. 219) and second generation Italians in Canada (Walker, 2021, p. 171).

6.2.4 Linguistic conditioning

In terms of the linguistic conditioning of plural existentials, a consistent finding is that tense is the most important factor, whereby THERE'S is more prevalent in present temporal reference contexts than in past temporal reference contexts (e.g. Britain & Sudbury, 2002; Eisikovits, 1991; Meechan & Foley, 1994; Walker, 2007, 2021). This is largely attributable to the frequent use of the contracted form *there's*, which occurs overwhelmingly with present temporal reference (though some past temporal reference instances do occur). For example, in New Zealand English, *there's* almost categorically occurred in present temporal reference contexts (166/170, 97%) (Hay & Schreier, 2004, p. 219). This is also the case in Hong Kong English, where 97% of THERE'S occurred in present temporal reference contexts (98/101) (Collins, 2012, p. 64).

Another widely reported factor in conditioning the variation of (THERE'S) is determiner type. The presence of determiners favoured THERE'S in many studies, but the effect of determiner type (e.g., *the, a lot of, many*) varied in its significance and direction, possibly due to different criteria of coding (as noted by Walker, 2007, p. 153). Negative *no*, number, and definite determiners (e.g., *the, these*) were often found to favour THERE'S (Britain & Sudbury, 2002, p. 224; Hay & Schreier, 2004, p. 218; Krejci & Hilton, 2017, p. 193; Meechan & Foley, 1994, p. 79). However, in some other studies, determiner type was not found to be significant and the ordering of different types of determiners varied (Walker, 2015, 2021).

The effects of three psycholinguistic processing factors, plural marker *-s* in the plural argument (presence vs. absence; e.g., *there's a lot of different dialects*), intervening material between THERE'S/THERE ARE and the plural argument (adjacent vs. non-adjacent; e.g., *there's only like three weeks or something*), and extension of the plural argument (presence of modifications vs. absence; e.g., *there's no people living there*), were similar in their directions across studies – the absence of plural marker *-s*, the absence of intervening material, and the absence of extensions all favoured THERE'S (Britain & Sudbury, 2002, p. 217; Collins, 2012, p. 67; Walker, 2007, p. 158). The presence of these factors has been interpreted to hinder speakers' ease of processing of the plurality of the NP argument (e.g., Breivik & Martinez Insua, 2008, p. 358). Furthermore, the effects of these factors overlapped. For example, Martinez Insua and Palacios Martinez (2003, p. 277) found a significant interaction between intervening material

and extension, such that “the longer the post-verbal sequence, the higher the likelihood of [the singular vs. plural form]”. In their data, 69% of THERE’S without any intervening material contained an extension, but this rate was even higher in writing than in speech (84% vs. 66%). Thus, THERE’S was connected with the length and complexity of its postverbal sequence encoded either by the intervening material between THERE’S/THERE ARE and the plural argument or an extension of the plural argument (Martinez Insua & Palacios Martinez, 2003, pp. 279-280).

In summary, in terms of rates of use, singular THERE’S is the majority variant in almost all varieties of English, but variability exists across and within varieties. One variety, Hong Kong English, showed the lowest rate in THERE’S. Furthermore, previous studies found that (THERE’S) was conditioned by a wide range of linguistic and processing factors, including tense, determiner type, extensions, plural marker *-s*, and intervening materials. With respect to social factors, effects of class and age were consistent, with the working class and younger speakers favouring THERE’S; the main effect of gender was rarely significant, but it interacted with age, with younger women favouring THERE’S. Furthermore, some studies have found that THERE’S cannot be defined as a nonstandard variant, and its social markedness was weak, at least at the community level (e.g., Hilton, 2018; Krejci & Hilton, 2017; Tagliamonte, 1998). Only a few studies have investigated ethnicity and its interaction with other factors, making the association between (THERE’S), ethnic variation and the broader conditioning unclear. Moreover, Walker (2021, p. 176) found that tense showed an interaction effect with ethnicity, where in the present tense contexts, the Italian Canadians preferred *there’s* over the British/Irish and Chinese Canadians, while in the past tense contexts, the British/Irish and Italian Canadians favoured *there’s* over the Chinese Canadians. This ethnic division in the tense effect was not attributable to heritage language transfer (Walker, 2021, p. 178). This may be suggestive of ethnic difference according to linguistic conditioning, but it was not accounted for. Thus, (THERE’S) is an interesting variable for testing ethnic variation and the effects of other social factors on it.

This chapter aims to address whether working class speakers favour THERE’S over lower middle and middle class speakers, as previous research has identified a strong class effect associated with (THERE’S). Additionally, I am exploring the timing of change regarding (THERE’S) in Australian English and investigating whether an apparent time change exists, wherein younger speakers use THERE’S at a higher rate compared to older speakers. Moreover, I am interested in understanding how this change is adopted across social groups among Anglo Australians, and I am examining the role of Chinese Australians in this change.

To investigate potential language transfer from Cantonese, I am also analysing the patterns among speakers of Hong Kong English.

6.3 Methodology

6.3.1 Circumscribing the variable context

I extracted all instances of the existential *there* constructions[21], including ***there's*** / ***there is*** / ***there are*** / ***there're*** / ***there was*** / ***there were*** through an R script in both the Sydney Speaks corpus and the ICE-HK. I also searched for contexts where the forms were inverted (e.g. in interrogatives), and there was only one such instance, which occurred in the Sydney Speaks corpus with a plural verb form, illustrated in (50), which was not included in the analysis. From the extracted set, I excluded all those with singular arguments, so only instances of the existential with plural arguments were included in this study, as this is where the variability lies. Then, I excluded all truncated tokens without an overt argument (51), and tokens that were incomplete or repaired, such as the first token in (52). Furthermore, in the ICE-HK data, I excluded tokens of non-idiomatic usage of (THERE'S) that showed possible L2 influence (n = 8) (53).

Excluded instances of (THERE'S):
(50) Inversion:
during the incident,
what did they do.
.. ***Were there*** *protests,*

(SydS_CYF_020_Alison)

(51) Truncated:
and yeah ***there's*** *–*
not that far=,
really=.

[21] I also searched for other existentials in the Sydney Speaks corpus. There were no occurrences of *there seem / seemed and there exist / exists / existed*; and only three of *there seems*, all of which were followed by singular arguments.

(SydS_AOF_009_Deidre)

(52) Repaired:
Yes ***there's*** *uh* ***there are*** *two parts*

(ICE-HK_S1A_030_Kai Ying)

(53) L2 usage:
there are *lot of lot of lots of <,>*
many kinds of ***expression***

(ICE-HK_S1A_009_Karen Wong)

Following this protocol resulted in 601 tokens of (THERE'S) from 72 Adult Anglo, Young Adult Anglo, and Chinese Australians in the Sydney Speaks corpus (range 2-22, mean = 8.35, SD = 4.11). Of these, 51 speakers used (THERE'S) variably, 16 speakers used THERE'S categorically, and 5 speakers used THERE ARE categorically. Additionally, there were 196 tokens from 82 speakers in ICE-HK (range 1-8, mean = 2.39, SD = 1.73). Of these, 25 speakers used (THERE'S) variably, 14 speakers used THERE'S categorically, and 43 speakers used THERE ARE categorically. Given small numbers of tokens, I included all tokens in the following analyses.

6.3.2 Statistical analyses

The methods employed in this chapter are consistent with those used in the previous chapters on prevocalic *the* and future temporal reference, including a range of descriptive and inferential statistical methodologies. I begin by presenting descriptive statistics that illustrate the distribution of social and linguistic predictors. Subsequently, I evaluate the main and interaction effects of these factors using three multivariate statistical methods, namely, Conditional Inference Tree, Random Forest and Mixed-effects Generalised Binomial Logistical Regression. As above, for the latter, I conduct four sets of regression models.

Specifically, I conducted three sets of regression models following the analytical steps employed in the previous chapters on prevocalic *the* and future temporal reference for the Sydney Speaks dataset. Comparing THERE'S vs. THERE ARE: in apparent time, focusing on Anglo Australians from both age groups; across ethnicity for Young Adult Anglo and Chinese Australians; for Chinese Australians only with different measures of ethnic orientation. A separate regression model was conducted for ICE-HK.

In each regression model, the realisation of (THERE'S) served as the dependent variable (predicting the THERE'S variant). Random intercept was included for Speaker. It is important to note that the independent variables included in the models varied due to different data configurations. I will explain these differences below.

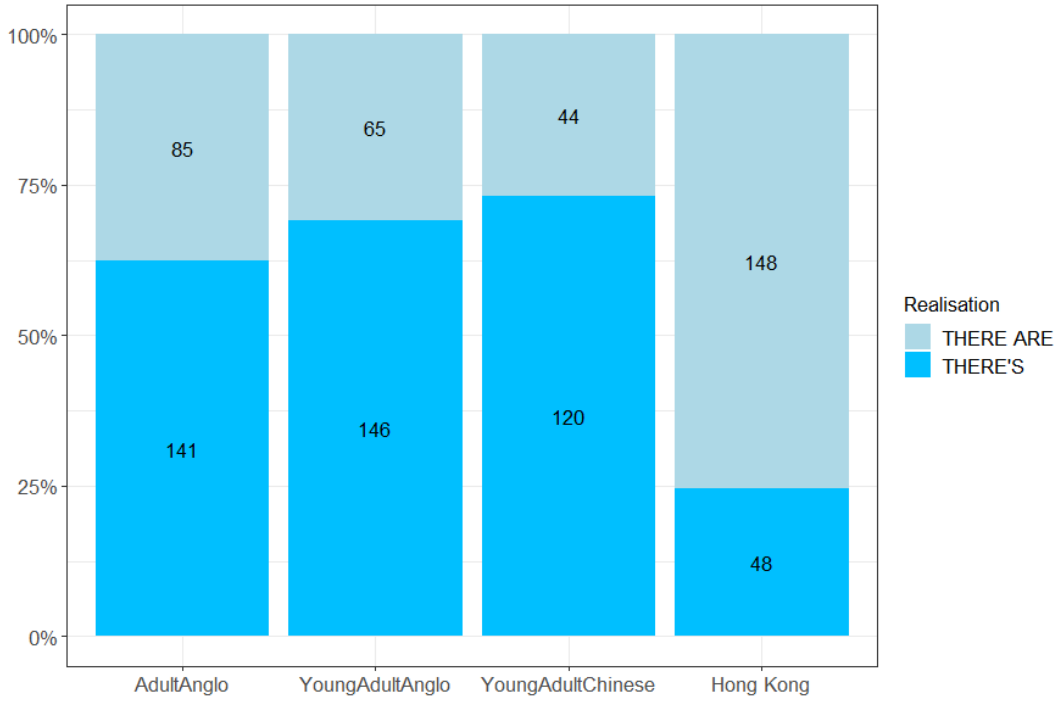
6.4 Data distribution for the predictors

All of the target tokens were annotated to assess the linguistic and social conditioning of the THERE'S and THERE ARE variation. These constraints include social factors age, community, gender, social class, and linguistic factors tense, determiner type, adjacency, extension, and plural marker *-s*.

6.4.1 Age and community

I start by examining the overall distribution of the variants of (THERE'S) across different age groups and communities to gain an overview of the changes in Australian English and the distinctions between Australian English and Hong Kong English. Figure 43 displays the rates of the two variants for Adult Anglo Australians in the first column, followed by Young Adult Anglo Australians, Chinese Australians, and individuals from Hong Kong in the second, third, and fourth columns, respectively. The proportions of THERE'S and THERE ARE (which add up to 100% for each group) are depicted in light blue and blue panels. The raw token counts for each variant are provided within each bar.

Figure 43 Distribution of the realisations of (THERE'S) by Age and Community.



As can be observed, among the Adult Anglo Australians, the usage rate of THERE'S is 62%. It is slightly higher for the Young Adult Anglos (69%), and for the Young Adult Chinese Australians (73%), which closely resembles that of Anglo Australians. Thus, there is little evidence of an ongoing change towards increased THERE'S usage in Australian English. In contrast to future temporal reference, where the Chinese are more similar to Adult Anglos in having a higher rate of *will*, in the case of (THERE'S), these three Australian groups exhibit very similar rates, with the Chinese closer to their Young Adult peers than the Adults of the previous generation.

Additionally, when compared to the results presented in Figure 42, with an average THERE'S usage rate at 68%, Australian English aligns closely with most other varieties of English (overall rates: Canadian English at 74%, British English at 72%, New Zealand English at 62%, and Californian English at 67%). This supports the argument that the variable realisation of plural existentials is "a vernacular universal" (Chambers, 2003, p. 133; Walker, 2007, p. 148).

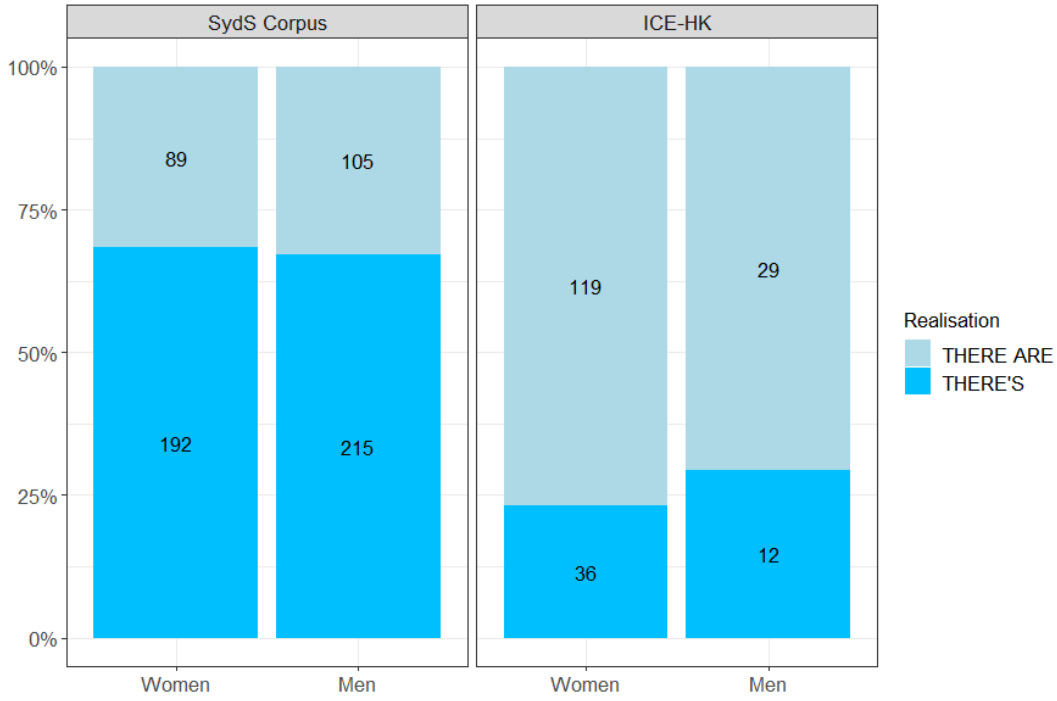
In Hong Kong English, the usage rate of THERE'S is the lowest, at just 24%, which is notably distinct from the rate observed in the Australian data. This rate in Hong Kong English aligns closely with the findings in Collins (2012, p. 63), where it was reported as 22%, based on the same data source (Figure 42). The slight discrepancy in results can be attributed to differences

in sampling processes. Here, I only included data from face-to-face conversations in ICE-HK, as described in Chapter 3 Methodology, while Collins (2012) examined all spoken data from ICE-HK, including public dialogues, private phone calls, scripted broadcast news, spontaneous commentaries, etc..

6.4.2 Gender

Figure 44 illustrates the proportional distribution of the realisations of (THERE'S) by gender in Australian English and Hong Kong English.

Figure 44 Distribution of the realisations of (THERE'S) by Gender.



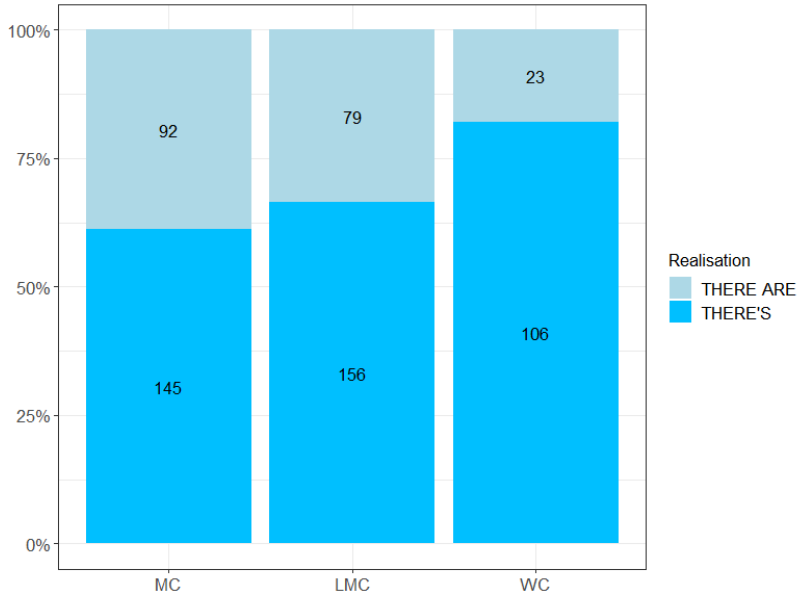
In Australian English, there is minimal gender-based differentiation, with women at 68% THERE'S and men at 67%. In Hong Kong English, women have a slightly lower rate of THERE'S, at 23% vs. 29% for men.

6.4.3 Social class

As there is no available socio-economic information on speakers of Hong Kong English, I have only examined the social class effect in Australian English. Figure 45 illustrates that among the three groups of Australians, a class effect is evident. MC speakers have the lowest rate of

THERE'S, at 61%, compared with 66% for LMC speakers, and a higher rate at 82% for WC speakers. These patterns indicate a class distinction in Australia, consistent with that described elsewhere. It should be noted that this distribution is surprising, especially considering the notably high rate among Chinese Australians. This suggests the need for an examination of interactions across different predictors.

Figure 45 Distribution of the realisations of (THERE'S) by Social Class.



6.4.4 Tense

The consistent effect of tense (past vs. present) has been observed, such that the present tense strongly favoured THERE'S (e.g. Britain & Sudbury, 2002; Hay & Schreier, 2004; Meechan & Foley, 1994; Walker, 2007, 2021). Therefore, I would predict the singular form THERE'S to be favoured in present temporal reference contexts. To test and compare the effect of temporal reference in Australian English and Hong Kong English, I coded a two-way distinction. Specifically, for tokens in which temporal reference was overtly marked by the morphology of the copular be, present (54) and past (55) were coded as such; for the contracted form, *there's*, its temporal reference was inferred from the discourse context (e.g., a preceding future *there'll be* indicates present temporal reference in (56); a preceding adverbial *this is back when* in (57) provides a past temporal reference context) (Hay & Schreier, 2004, p. 219). Notably, 97% of the contracted form *there's* in the Sydney Speaks corpus occurs in present temporal reference contexts (290/299), similar to the rates in other varieties of English (Collins, 2012, p. 64), while all tokens of *there's* in ICE-HK are present (36/36). Theoretically, *there's* could occur in past

temporal reference contexts, but this is rare. For the other forms of realisation, such as *there are/were* tokens, there is more variability in their temporal reference.

(54) Present temporal reference:
*I think **there is** other chapters which is relevant as well*

(ICE-HK_A1A_015_Pui Yin)

(55) Past temporal reference:
***there was** a lot of,*
...Chinese expectations that you never –
... had to go through.

(SydS_CYM_075_Alec)

(56) Present temporal reference contracted *there's*:
I think my area compared to the North Shore,
there'll be .. less Asians?
*.. **there's** .. actually quite a lot of Asians .. around the North Shore?*

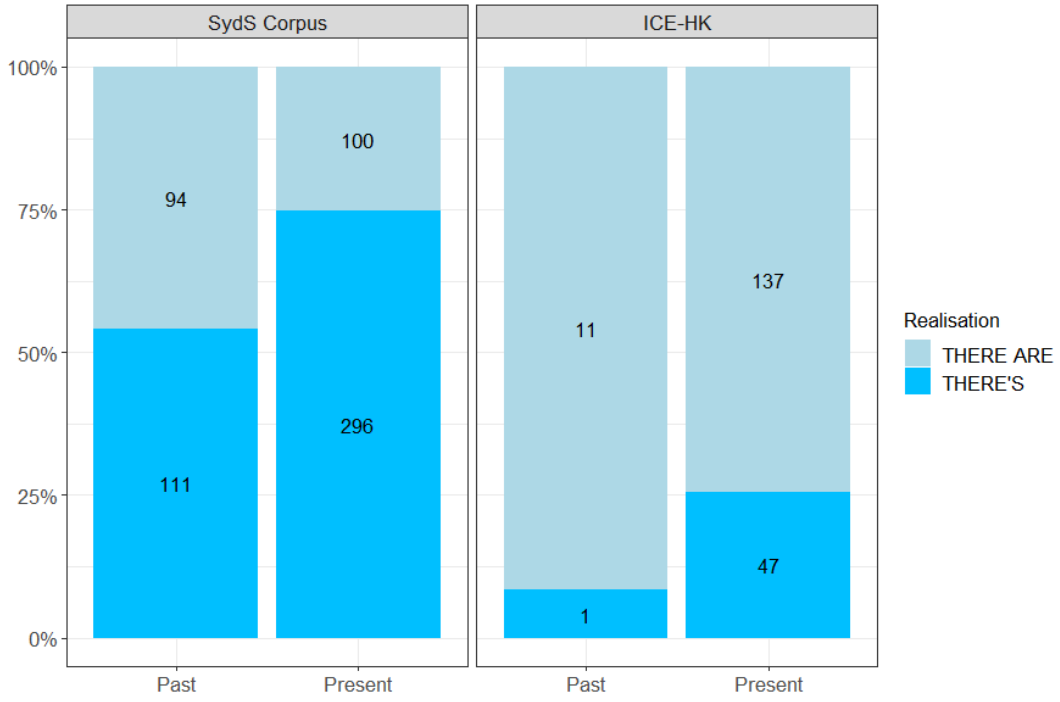
(SydS_CYF_002_Karmen)

(57) Past temporal reference contracted *there's*:
*[this is back when] **there's** like,*
school holidays.
and then you ha- --
<X like X> --
.. you literally had five days to do nothi[ng @].

(SydS_CYM_038_Aaron)

Figure 46 illustrates the distribution for Tense in the Sydney Speaks corpus on the left and in ICE-HK on the right.

Figure 46 Distribution of the realisations of (THERE'S) by Tense.



In Australian English, the rate of THERE'S is 54% in past temporal reference contexts, and 75% in present temporal reference contexts. In ICE-HK, there are only 12 tokens in past temporal reference contexts (compared to 184 tokens in present temporal reference contexts). In past temporal reference contexts, THERE'S is quite low, at 8%, while in present temporal reference contexts, THERE'S usage is higher, at 26%. These patterns suggest that, similar to Australians, the speakers of Hong Kong English tend to use THERE'S more frequently in present rather than past temporal reference contexts. However, due to the limited number of tokens in past temporal reference contexts (only 12), I cannot include Tense as a predictor in the regression model for ICE-HK, though it will be explored through tree-based models.

6.4.5 Determiner type

The effect of determiner type varies across studies due to different configurations of determiners (as noted by Walker, 2007, p. 153). Determiners were frequently divided into seven main categories, including bare NP (58), bare adjective (59), definite (60) (including *the, this, that, these, those*, personal and possessive pronouns), negatives (including both *no* and *not*) (61), numbers (62), quantifier with the indefinite article a (*including a lot of, a few, a number of, a bunch of, a couple of*) (63) and other quantifiers (including *more, much, less, few, lots of*) (64) (Britain & Sudbury, 2002; Hay & Schreier, 2004; Walker, 2007, 2015, 2021).

(58) Bare NP:
there's *ways to better yourself*

(SydS_AYM_124_Craig)

(59) Bare adjective:
there's *different things and*

(SydS_AYF_016_Jocelyn)

(60) Definite:
there's *always .. the outliers*

(SydS_CYM_066_Kaleb)

(61) Negative:
but ***there's*** *no mosquitoes in my room*

(ICE-HK_S1A_055_Ho Yan)

(62) Number:
uh I think ***there were*** *like twenty of them of us*

(ICE-HK_S1A_091_Lee Sing)

(63) Quantifier with a:
there's *a lot of serious issues*

(SydS_AOM_105_Parker)

(64) Other quantifiers:
there is *some people who just do that though.*

(SydS_AOF_007_Annette)

The ordering of determiner type in favouring THERE'S across studies is summarised in Table 17. In Canadian English, Meechan and Foley (1994) found that the only distinction was between negative *no* and other determiners (including number and all other quantifiers), with negative *no* favouring the singular variant THERE'S more than other determiners (Meechan & Foley, 1994, p. 79). In New Zealand English, a significant effect of determiner type on the variation of (THERE'S) was found in Britain and Sudbury (2002) and Hay and Schreier (2004). In Britain and Sudbury (2002, p. 224) (New Zealand 1 in the table), negative *no*, number, and definite were the top three factors favouring THERE'S; in Hay and Schreier (2004, p. 218) (New Zealand 2 in the table), number, negative, quantifier with *a*, and definite were the top four

factors favouring THERE'S. Similar to New Zealand English, the ordering of determiner type favouring THERE'S in Falkland Island English was negative *no* > definite > number (Britain & Sudbury, 2002, p. 224). In York English in the UK, Tagliamonte (1998, p. 171) only looked at (THERE'S) in the past temporal reference contexts, and she found that the ordering of the determiner type favouring THERE'S (negative no > partitive > definite) was substantially consistent with the patterns found in other varieties of English. The results of these studies suggested that determiners that occurred high in the ordering included negative *no*, definite, number, quantifier with *a*, while determiners that occurred low in the ranking were other quantifiers, bare NP and adjective (see also Rupp & Britain, 2019, p. 263).

Table 17 Ordering of determiner type in favouring THERE'S across studies (developed from Walker (2007, p. 153)).

Varieties	Ordering of determiner type
Canada	negative *no* > number > other quantifier
New Zealand 1	negative *no* > number > definite > bare > other quantifier > adjective
New Zealand 2	number > negative > quantifier with *a* > definite > other quantifier > bare > adjective
Falkland Island	negative *no* > definite > number > bare > other quantifier > adjective
UK	negative *no* > partitive > definite > number > other quantifier > undetermined

Notes. Canada (Meechan & Foley, 1994, p. 80), New Zealand 1 (Britain & Sudbury, 2002, p. 224), New Zealand 2 (Hay & Schreier, 2004, p. 218), Falkland Island (Britain & Sudbury, 2002, p. 224), and UK (United Kingdom) (Tagliamonte, 1998, p. 171).

Drawing on previously recognised types, I coded six types of determiners, including definite (e.g., *the, these*), negative *no*, number (e.g., *five, forty*), quantifiers with *a* (e.g., *a few, a lot of*), other quantifiers (e.g., *some, many, lots of*) and bare NP. A bare NP was defined as a noun without any modification, or modified by an adjective without a determiner (see also Walker, 2015, p. 13). The distributions of determiner type across groups are shown in Table 18 for the three Australian groups and ICE-HK. It is noticeable that there are some differences in the ordering of determiner type across communities, but overall, a semantic distinction converges with the patterning here, allowing for two broad categories of definite/number vs. indefinite (Walker, 2015, 2021).

Specifically, we see that there are limited tokens of definite articles, but they are more likely to occur with the singular THERE'S in both Australian English and Hong Kong English. There are only 17 tokens of negative *no* in total (13 tokens in the Sydney Speaks corpus and 4 tokens in ICE-HK) and they occur frequently with THERE'S (82%, 14/17), corroborating similar findings in

other studies (e.g. Britain & Sudbury, 2002, p. 218; Meechan & Foley, 1994, p. 79). For number, it also frequently occurs with THERE'S in Australian English, similar to the patterns found in New Zealand and Falkland Island English (Britain & Sudbury, 2002, p. 224; Hay & Schreier, 2004, p. 218). However, in Hong Kong English, number does not show a favouring of THERE'S. Thus, the data do not neatly divide along syntactic lines – definite NPs function similarly in the Australian data to indefinite NPs occurring with numbers (and negative *no*, though this occurs much more rarely). These three are distinct from other indefinite NPs (bare NPs, quantifiers with *a*, and other quantifiers), which occur less often with THERE'S. For bare NP, quantifiers with *a*, and other quantifiers, the cross-group differences are very salient, but they show lower rates of THERE'S compared with those of Definite/Number. It is noticeable that in Hong Kong English, more than half of the data occurs with other quantifiers (the most frequent quantifiers are *many* (n = 34), *some* (n = 19), and *so/too many* (n =17)). As these three types of determiners are semantically indefinite, they are coded as Indefinite. This operationalisation also allows us to test the definiteness hypothesis of the determiners – existential constructions are used to introduce new things and indicate indefiniteness encoded by the determiners (e.g. Chen, 2011, p. 64; Hazout, 2004, p. 394).

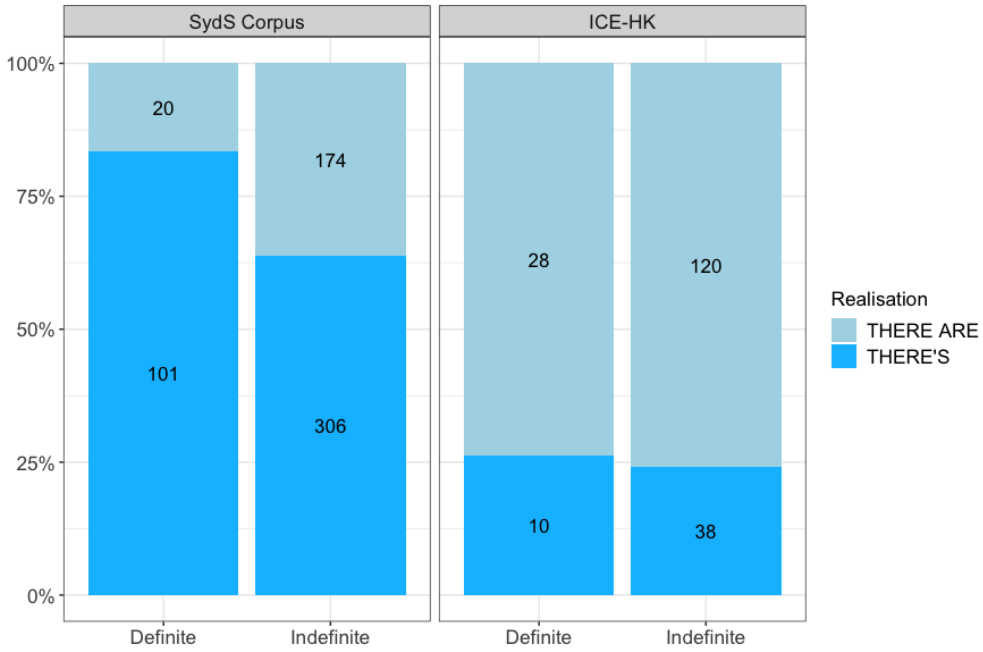
Table 18 Ordering of determiner type in different groups.

Determiner type	Adult Anglos (n = 226, 63% THERE'S)		Young Adult Anglos (n = 211, 69% THERE'S)		Young Adult Chinese (n = 164, 73% THERE'S)		Hong Kongers (n = 196, 24% THERE'S)	
	N	% THERE'S	N	% THERE'S	N	% THERE'S	N	% THERE'S
Definite	17	76%	9	100%	10	100%	2	50%
Negative *no*	6	100%	3	100%	4	75%	4	50%
Number	34	71%	28	93%	17	71%	31	19%
Bare NP	60	63%	67	58%	51	69%	42	17%
Quantifiers with *a*	50	62%	40	78%	47	81%	15	33%
Other quantifiers	59	51%	64	59%	35	63%	102	26%

Once I collapse these categories, as presented in Figure 47, we see a general tendency for there to be a higher rate of the singular THERE'S with definite/number than indefinite determiners, but that is stronger for Australian English. The effect of determiner type appears to differ from Australian English, which has a much higher rate of THERE'S with definite/number determiners (83% vs. 64%), while in Hong Kong English, there is little difference (26% vs.

24%). I will further test and compare this effect across communities in the following statistical models.

Figure 47 Distribution of the realisations of (THERE'S) by Determiner Type.



6.4.6 Adjacency

Adjacency relates to whether (THERE'S) is immediately followed by the subject NP, as shown in example (65), or whether there is intervening material, such as adverbs (e.g., *about, probably, certainly, just, still, only, also, quite*), discourse markers (e.g., *like, I think*), hedging (e.g., *kind of*), etc., as shown in examples (66), (67), and (68), respectively. Some production studies found that non-adjacent existential clauses favoured THERE'S over THERE ARE (e.g. Britain & Sudbury, 2002, p. 229; Martinez Insua & Palacios Martinez, 2003, p. 277; Walker, 2007, p. 161), which was also attested in a perception study of the social meaning of (THERE'S), such that in non-adjacent existential clauses, THERE'S was "less marked and more acceptable" (Hilton, 2018, p. 243). It is argued that the increased distance between (THERE'S) and the subject NP caused by the presence of intervening materials interfered with speakers' processing of the number of (THERE'S) constructions in spontaneous speech (Breivik & Martinez Insua, 2008, p. 358). There are other studies that did not find such an effect to be significant, though the direction of this effect was the same (e.g., Hay & Schreier, 2004, p. 221; Riordan, 2007, p. 256). In order to further test whether there is an association between

intervening materials and the rates of THERE'S, we coded for adjacent and non-adjacent tokens of (THERE'S) constructions, as shown in the following examples.

Some studies have approached this factor in a continuous manner, assessing the number of words in the intervening material, to capture the range of complexity involved. The data examined here was heavily skewed towards single words intervening, meaning that it was not possible to treat adjacency as a continuous predictor. In the Sydney Speaks corpus, out of 157 instances of non-adjacency, that is, with intervening material (vs. 444 instances of adjacency), 115 are composed of a single word (the most frequent being *like* (n = 28), *still* (n = 14), and *just* (n = 13)), and 23 are composed of two words, many of which function as a single unit (e.g., *you know, kind of*). There are further 13 instances containing three words (e.g., *like you now, also I think, like kind of*), five instances containing four words (e.g., *like I don't know*), and only one instance containing five words (*at least, I don't know*)). In ICE-HK, all instances of non-adjacencies consist of a single word as intervening elements (n = 32) (vs. 164 instances of adjacency).

(65) Adjacent:
*because **there are** trams in the city,*

(SydS_AOF_005_Jamie)

(66) Non-adjacent: adverb
*so **there's** actually three women,*

(SydS_AYF_088_Emma)

(67) Non-adjacent: discourse marker
*I think **there are** like values that our country pushes,*

(SydS_AYF_035_Sophia)

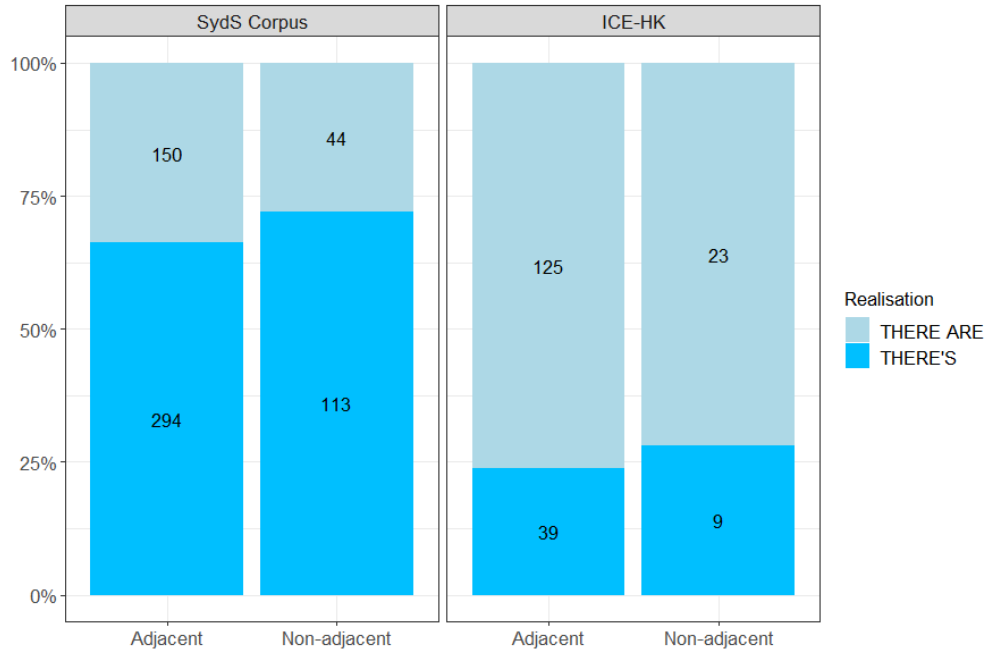
(68) Non-adjacent: hedging
***There's** kind of feminist .. things in there,*

(SydS_AOF_080_Abigail)

Figure 48 presents the realisations of (THERE'S) by Adjacency in Australian English and Hong Kong English, respectively. In the Sydney Speaks corpus, in adjacent existential clauses, the rate of THERE'S is 66%, while in non-adjacent existential clauses, the rate of THERE'S is slightly higher, standing at 72%. In ICE-HK, the rate of THERE'S in adjacent existential clauses is 24%,

while it is 28% in non-adjacent existential clauses. These patterns suggest a weak effect of Adjacency in the same direction in both varieties.

Figure 48 Distribution of the realisations of (THERE'S) by Adjacency.



6.4.7 Extension

Syntactic extension refers to whether there is another element following the subject NP (an adverb, phrase or clause), or whether the subject NP occurs on its own. The argument here is that variable agreement is sensitive to the syntactic complexity of the following clauses (Walker, 2007, p. 156). It has been found that the absence of an extension favours THERE'S in different varieties of English (e.g. Collins, 2012, p. 66; Riordan, 2007, p. 255), supporting the existence of the extension effect in the variation of (THERE'S).

I therefore coded whether any extension of the subject NPs was absent (69) or present, be that external to the NP (e.g. for an adverbial (70)) or internal to the NP (e.g. phrasal or clausal, including infinitives (71), past particles (72), progressive particles (73) and relative clauses (74)) (e.g. Collins, 2012; Martinez Insua & Palacios Martinez, 2003; Walker, 2007).

(69) Absence:
there's *a lot of serious issues.*

(SydS_AOM_105_Parker)

(70) Adverbial:

there're *about two to three groups every weekend*

(ICE-HK_S1A_019_Tam Grace)

Phrasal:

(71) Infinitive:

there's *so many good reasons to do it,*

(SydS_AOF_005_Jamie)

(72) Past particle:

there's *about twenty-five s- -- car par- -- .. spaces just gone,*

(SydS_AOF_010_Paige)

(73) Progressive particle:

yes and and ***there's*** *no people living there*

(ICE-HK_S1A_004_Ching Mei)

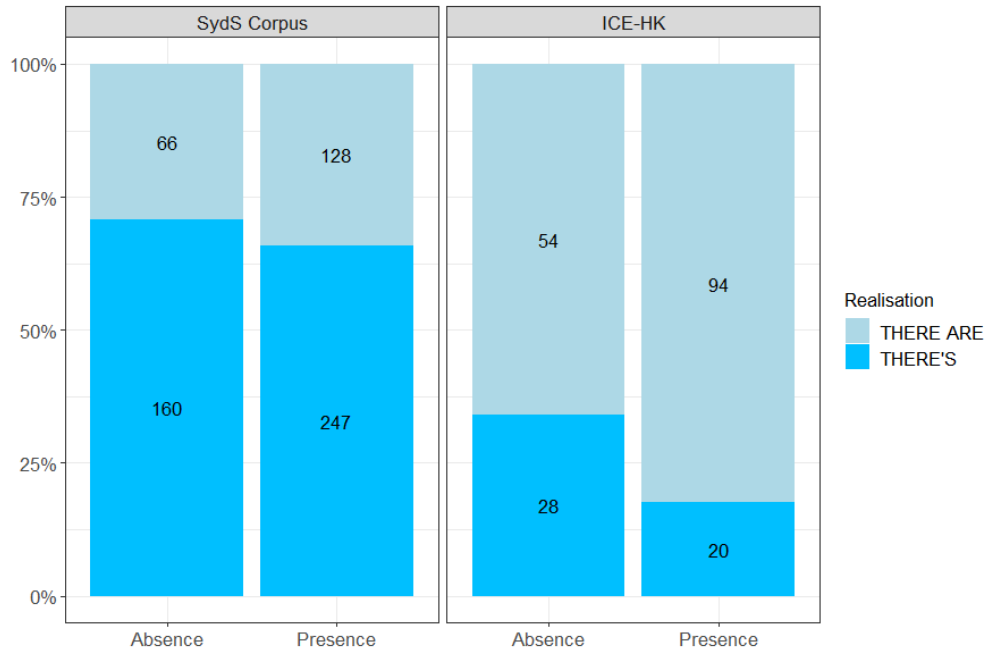
(74) Relative clause:

there's *certain s- positions that need to be filled in by women,*

(SydS_CYM_061_Mark)

Figure 49 illustrates the distribution of the realisations of (THERE'S) by Extension. In the Sydney Speaks corpus, in instances where a syntactic extension is absent, the rate of THERE'S is 71%; when a syntactic extension is present, the rate of THERE'S is slightly lower, standing at 66%. In ICE-HK, when a syntactic extension is absent, the rate of THERE'S is 34%. Conversely, when a syntactic extension is present, the rate of THERE'S is lower, standing at 18%. These patterns suggest a slightly higher rate of THERE'S when there is no syntactic extension in both varieties, but the effect of Extension appears to be weaker in the Sydney Speaks corpus.

Figure 49 Distribution of the realisations of (THERE'S) by Extension.



6.4.8 Plural marker *-s*

It has been proposed that when there is no plural marker *-s* on the determiners or nouns, speakers "may lose sight of the number of the notional subject" because of an increased processing load (Breivik & Martinez Insua, 2008, p. 358), resulting in a higher rate of THERE'S (Walker, 2007, p. 158). Thus, whether overt number marking is present is related to the degree of ease of processing (Walker, 2015, p. 14). To test this processing hypothesis here, we coded for the absence or presence of the plural marker *-s*, as in the following examples.

(75) Absence:
there is *five hundred children coming out.*

(SydS_AOF_118_Gillian)

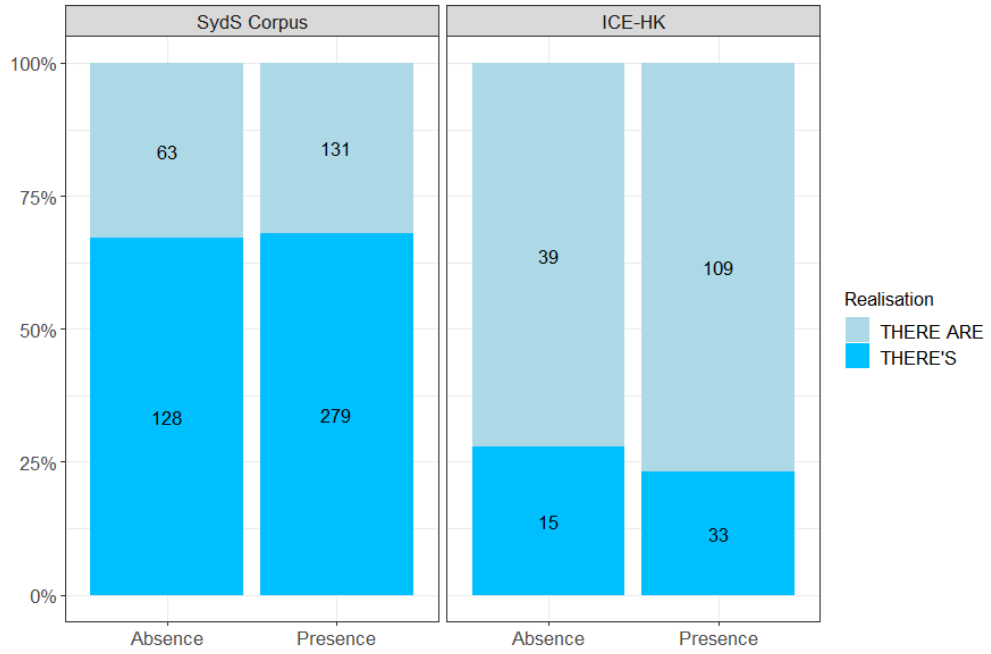
(76) Presence:
there's *a lot of different dialects.*

(SydS_CYF_020_Alison)

Figure 50 illustrates the distribution of the realisations of (THERE'S) by Plural Marker *-s*. In the Sydney Speaks corpus, in cases where a plural marker *-s* is absent, the rate of THERE'S is 67%, and is 68% when it is present. In ICE-HK, the rates are 28% and 23% respectively. These

patterns suggest little effect of Plural Marker *-s* on the realisations of (THERE'S) in both varieties of English.

Figure 50 Distribution of the realisations of (THERE'S) by Plural Marker *-s*.

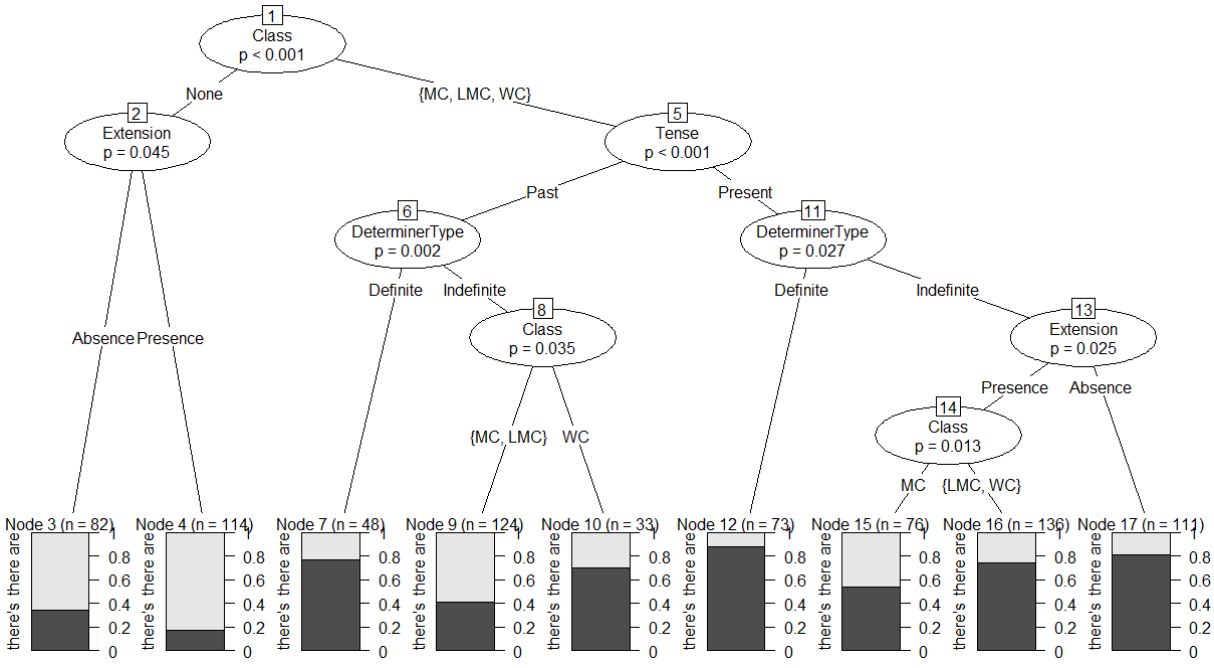


In summary, as shown in Table 16 and Figure 43, Anglo Adults in the 1970s were significantly lower in their use of THERE'S than Teens (El-Khaissi, 2017) and only slightly lower than Young Adults in the 2010s, indicating the advanced trajectory of this change in Australia. It is surprising that Chinese Australians use THERE'S at a very high rate, considering that this form has been found to be associated with the working class. Additionally, although constraints on (THERE'S) have been well attested, little is known about ethnic patterning of this variable and no single study has examined the interaction between ethnicity and class. Of the grammatical factors, the results of the descriptive analyses show that tense and determiner type have salient effects in both Australian English and Hong Kong English that go in the same direction: present tense and definite/number determiners have much higher rates of THERE'S. The effects of the processing factors, extension, adjacency and plural marker *-s*, are less pronounced, but their directions are largely consistent between Australian English and Hong Kong English. To investigate the statistical significance of these factors and their joint effects, different multivariate statistical methods are used, following what I have done in previous analyses of *the*+VOWEL and future temporal reference.

6.5 Recursive partitioning

Figure 51 shows a conditional inference tree from the full dataset which includes the social predictors of age-community (that is, Adult Anglo, Young Adult Anglo, Young Adult Chinese, Hong Kong), gender (men vs. women) and class (middle vs. lower middle vs. working vs. none for ICE-HK); and the linguistic predictors of tense (present vs. past temporal reference), determiner type (definite/number vs. indefinite), extension (absence vs. presence), adjacency (adjacent vs. non-adjacent), and plural marker *-s* (absence vs. presence)[22]. Its classification accuracy is 72%, which is significantly better than the baseline of 57% when always choosing the most frequent variant ($p_{binom} < 0.001$). The C-index for the model is 0.77, indicating that this analysis discriminates well between the variants (Baayen, 2008, p. 204).

Figure 51 Conditional inference tree analysis of the realisations of (THERE'S) in both varieties (n = 797).



The results indicate that class is the most important factor, as it is the first split (cf., Node 1). Since there is no class information available for the speakers in ICE-HK, this class effect also

[22] Formula: ctree(Realisation ~ AgeCommunity + Gender + Class + Tense + DeterminerType + Extension + Presence_s + Adjacency) with controls = ctree_control (testtype = "MonteCarlo", minbucket = 20)

distinguishes Hong Kong English from Australian English. In Hong Kong English, there is only a significant effect of a processing factor: extension (cf., Node 2). This effect aligns with the predicted direction, with the absence of an extension favouring THERE'S more than the presence of an extension.

In Australian English, tense is the most important linguistic factor (cf., Node 5). In past tense contexts, definite/number determiners favour THERE'S over indefinite determiners (cf., Nodes 6-10). Furthermore, there is an interaction between determiner type and class, as WC speakers favour THERE'S with indefinite determiners compared to MC and LMC speakers, who are similar to each other (cf., Nodes 8-10). In present tense contexts, determiner type is also an important factor, with definite/number determiners favouring THERE'S over indefinite determiners (cf., Nodes 11-17). Therefore, THERE'S is favoured with definite/number determiners in both past and present temporal reference contexts. Additionally, there is an interaction between determiner type, extension, and class. With indefinite determiners, the absence of extension favours THERE'S over the presence of extension (cf., Nodes 13-17). With the presence of extension, LMC and WC speakers favour THERE'S compared to MC speakers (cf., Nodes 13-16). These patterns suggest that Australian English exhibits complex interactions between class and linguistic factors, which will be further explored in the following regression analyses. However, no effects related to age-community, gender, or ethnicity are observed in the conditional inference tree.

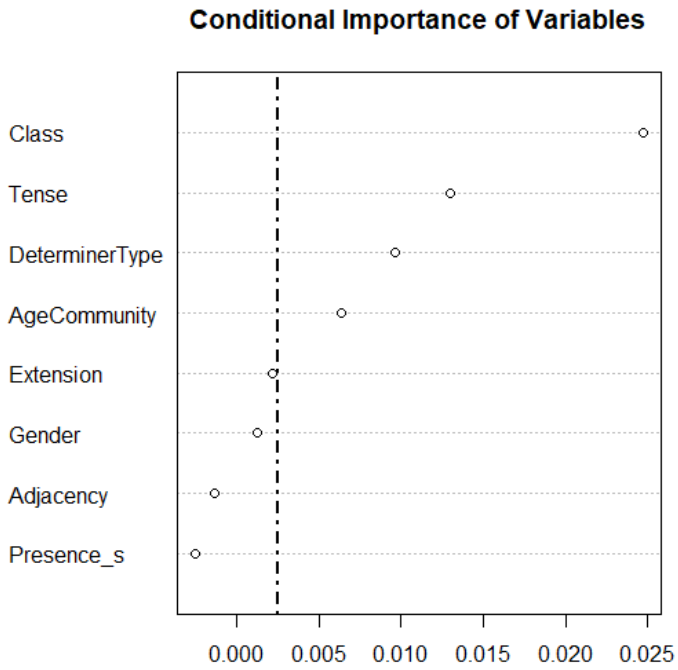
I then ran a random forest analysis to determine the conditional importance ranking of variables. Figure 52 presents the results from a random forest model run with 1000 trees and with 4 variables sampled at each split (Hothorn, Hornik, & Zeileis, 2006; Strobl, Malley, & Tutz, 2009)[23]. Its classification accuracy is 74%, which is significantly better than the baseline of 57% when always choosing the most frequent variant ($p_{binom} < 0.001$). The C-index for the model is 0.82, indicating it discriminates well between the variants (Baayen, 2008, p. 204).

Here, the horizontal axis shows the weights of factors while the vertical axis shows the ranking of each factor. Consistent with the result of the conditional inference tree, class, tense and determiner type are all important factors in the random forest. However, as we have seen earlier, as a random forest is based on numerous randomly selected subsamples of the same

[23] Formula: cforest(Realisation ~ AgeCommunity + Gender + Class + Tense + DeterminerType + Extension + Presence_s + Adjacency) with controls = cforest_unbiased (ntree = 1000, mtry = 4)

data, its results is not identical to that of the conditional inference tree. One notable difference is that here, AgeCommunity appears to be an important predictor. Gender and three processing factors exhibit weak effects, as they fall to the left of the dotted line, thus they will be excluded from the subsequent analysis[24]. Extension will be included in the following analysis due to its observed distribution differences between Australian English and Hong Kong English, along with its demonstrated effect in the conditional inference tree presented earlier. For the other factors, I will further test their main and interaction effects in the mixed-effects regression models by taking into account the variability of speakers.

Figure 52 Random forest analysis of the realisations of (THERE'S) in both varieties (n = 797).



6.6 Regression analyses

I will now present the analysis of the conditioning of (THERE'S) using mixed-effects regression models. In the random forest results, Class, Tense, Determiner Type and Age-Community

[24] I tested the effects of Gender, Adjacency, and Presence_s in the first regression model on the apparent time change of this variable for the Anglos, and they were not significant, which confirmed the results of the tree-based models and provided further justification of not including them in the following regression models.

were found to have a conditional importance value greater than 0, indicating that each should be included in the regression models to assess the magnitude and significance of their effects. However, it is important to note that the independent variables included in the models varied due to different data configurations. I explain these differences below.

To examine the conditioning of (THERE'S) in Australian English, I conducted three sets of regression models following the analytical steps employed in the previous chapters on future temporal reference and prevocalic *the*. In the first two models, AgeCommunity was split into two categories, namely, Age (Adult and Young Adult) and Ethnicity (Anglo and Chinese), which allowed me to assess the apparent time change and ethnic variation. The third model examined the effects of the measures of ethnic orientation among Chinese Australians. The analysis of (THERE'S) in Hong Kong English involved running a separate regression model that incorporated the 82 speakers in this sub-corpus.

6.6.1 Apparent time: Anglo Adults vs. Young Adults

To investigate whether (THERE'S) displays apparent time change in Australian English, I compared Adult Anglo Australians with Young Adult Anglo Australians. As the conditional inference tree showed that there were two three-way interactions between Class (MC vs. LMC vs. WC), Tense (Present vs. Past), Determiner Type (Definite/Number vs. Indefinite), as well as between Tense, Determiner Type, and Extension (Absence vs. Presence), these interactions were included in the regression model. Additionally, I included a two-way interaction between Age and Class to explore its potential effects, consistent with the approach used in the previous chapters for the other two linguistic variables.

Thus, when comparing all Anglo Australians, I began with a maximal model that included two three-way and one two-way interactions (Class * Tense * DeterminerType + Tense * DeterminerType * Extension + Age * Class) to predict the variation between THERE'S and THERE ARE. Speaker was included as a random effect. I then pruned the model according to the significance level of the predictors, as previously described. The regression analyses confirmed a lack of increase in the new variant THERE'S in apparent time, with both Young Adult Anglos and Adult Anglos show similarly high rates of THERE'S, as shown in Figure 43. These patterns suggest that (THERE'S) is not an ongoing change in Australian English.

Table 19 presents the results of the final mixed-effects logistic regression model[25]. Among the factors considered, Determiner Type demonstrates a main effect, whereas Tense reveals a significant interaction with Class. There is no significant effect of Extension, aligning with the findings from descriptive statistics for the Sydney Speaks corpus, as illustrated in Figure 49.

Table 19 Model summary for the regression on the realisation of THERE'S (vs. THERE ARE) for Adult and Young Adult Anglo Australians.

	Estimate	Std. Error	z value	Sig.
Intercept	0.40	0.59	0.67	0.501
Class$_{\text{Middle vs. }\textbf{Lower Middle Class}}$	0.87	0.78	1.11	0.267
Class$_{\text{Middle vs. }\textbf{Working Class}}$	1.86	0.90	2.06	<0.05
Tense$_{\text{Present vs. }\textbf{Past}}$	-0.87	0.53	-1.65	0.100
DeterminerType$_{\text{Indefinite vs. }\textbf{Definite/Number}}$	1.74	0.43	4.06	<0.001
Class$_{\text{Middle vs. }\textbf{Lower Middle Class}}$: Tense $_{\text{Present vs. }\textbf{Past}}$	-1.52	0.75	-2.04	<0.05
Class$_{\text{Middle vs. }\textbf{Working Class}}$: Tense$_{\text{Present vs. }\textbf{Past}}$	-0.58	0.87	-0.66	0.508

For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of THERE'S.

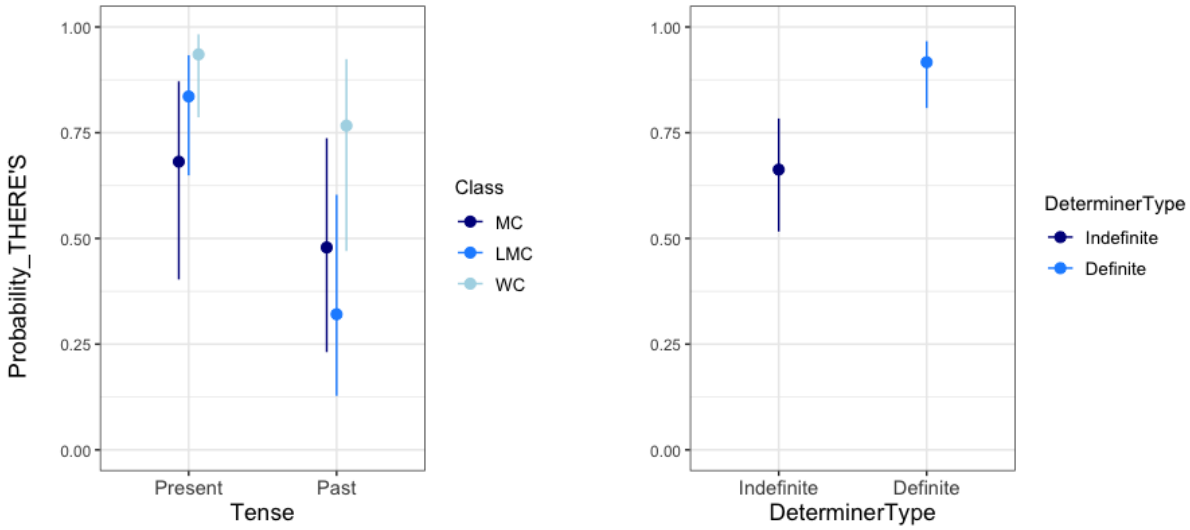
Overall rate of THERE'S is 66% (288/437). 51 speakers, Speaker variance = 3.309 (*SD* = 1.819); Log likelihood: -206.2; AIC: 428.4; BIC: 461.0. No significant effects for Age and Extension.

Regarding conditioning, in line with the earlier observations in the conditional inference tree, there is an interaction between Tense and Class, which is visualised in the left panel of Figure 53. The horizontal axis distinguishes two temporal reference contexts: Present on the left and Past on the right. In both present and past temporal reference contexts, THERE'S is most favoured by the WC compared to the other two class groups. This interaction primarily stems from differences between LMC and MC Anglos. Specifically, in present temporal reference contexts, the LMC favour THERE'S over the MC, while in past temporal reference contexts, the class effect reverses, with the MC favouring THERE'S over the LMC. These patterns suggest that Anglo Australians from different class groups use THERE'S differently in various temporal reference contexts. These patterns also aid in interpreting the class effect, and I will consider these when examining its interaction with ethnicity in the following section.

[25] Formula: glmer(Realisation ~ Class * Tense + DeterminerType + (1|Speaker))

In the right panel of Figure 53, the main effect of determiner type is depicted. Definite/number determiners favour THERE'S over indefinite determiners. This finding aligns with previous research (cf., Riordan, 2007, p. 353) and confirms the observations made earlier regarding the data distribution and the nonparametric statistical results in the conditional inference tree.

Figure 53 Effect plots of the interaction between Class and Tense and the main effect of Determiner Type for THERE'S (vs. THERE ARE) for Anglo Australians.

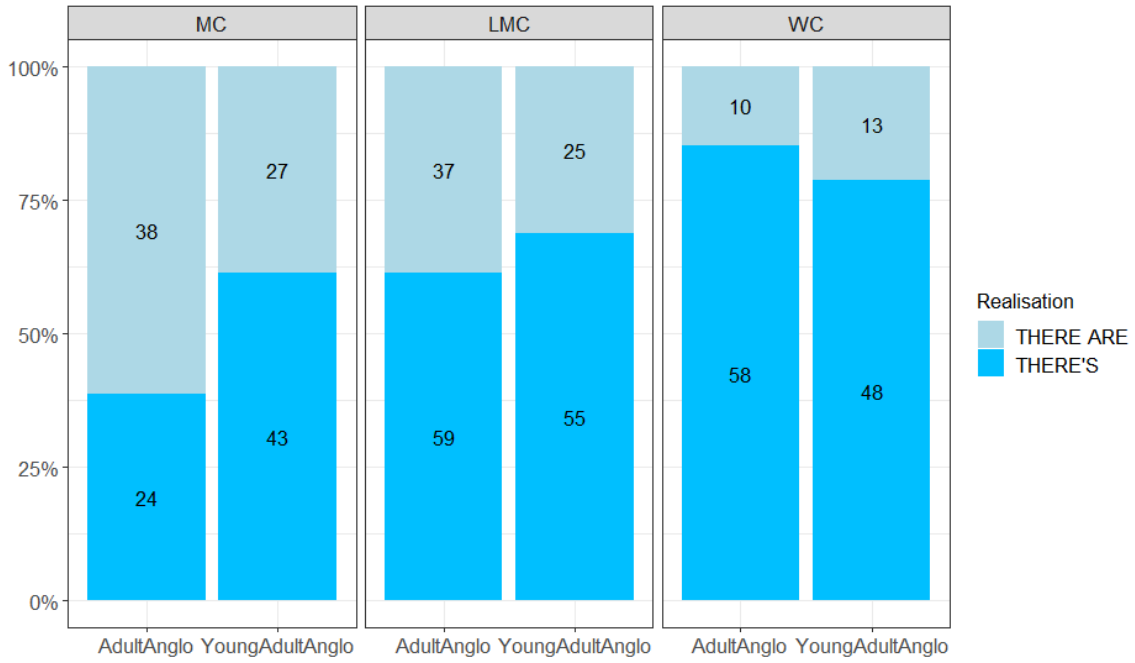


While the interaction between age and class does not reach significance in the model, Figure 54 illustrates the cross-tabulation of their distributions. The reason for examining these factors is rooted in the observation that, in the 1970s data, Teens did not exhibit a class effect, whereas Adults showed a class effect with the working class speakers favouring THERE'S. To assess whether such age-conditioned class stratification still persists in the 2010s data, I visualise them to better understand the relationship between these two factors. Understanding these results would also assist in interpreting the ethnic differentiation among Chinese Australians, based on what we have seen so far.

The distributions reveal that, overall, the working class speakers from both age groups show a higher rate of THERE'S, which aligns with the conclusions drawn from the regression model above. However, there appears to be some age-conditioned class stratification, indicating a trend toward a reduced class effect over time. Specifically, for the Adult Anglo Australians, the class effect is more defined (WC > LMC > MC), so I ran a separate regression analysis of their data (27 speakers, n = 226). The results confirm that the WC are significantly different from the MC (Estimate = -2.99, *z* value = -2.61, $p < 0.01$), but the LMC are not significantly different from the MC (Estimate = -1.19, *z* value = -1.21, $p = 0.228$). For the Young Adult Anglos (24

speakers, n = 211), though the WC use the highest rate of THERE'S, a separate regression analysis shows that the class effect is not significant ($p > 0.05$). These patterns show that the class effect has been declined over time in Australian English, corroborating the findings in El-Khaissi (2017) that the Teens did not show a class effect, based on data collected in the 1970s.

Figure 54 Cross-tabulation of the Age and Class distribution for THERE'S (vs. THERE ARE) for Anglo Australians.



6.6.2 Across ethnicity: Anglo vs. Chinese Young Adults

We saw above that Young Adult Anglos have a similar rate of THERE'S to the Chinese. However, before concluding that Chinese Australians parallel with Anglo Australians, it is crucial to consider the socioeconomic class patterns observed among Anglo Australians. Specifically, I must take into account that the WC class is leading the shift toward increased usage of THERE'S. Chinese Australians are anticipated to avoid THERE'S as a marker of their middle class orientation, but hey employ it at a very high rate. To address these questions and gain a better understanding, I will now compare the variation in (THERE'S) between Chinese Australians and Anglo Australians.

In order to interpret the Chinese patterning in the second model, I excluded all WC speakers from the Young Adult Anglo Australian sample to make it comparable with the Chinese Australian sample. Specifically, I set aside 7 Young Adult WC Anglos, resulting in the exclusion

of 61 tokens. Subsequently, I conducted regression analyses on the 314 tokens from the remaining 17 Young Adult Anglo and 21 Chinese Australians, making a two-way distinction between MC and LMC.

In the comparison between Young Adult Anglo and Chinese Australians, I employed the same regression model that was used for the Anglo Australians. As suggested by the conditional inference tree, I included two three-way interactions that were identical to those included in the model for apparent time analysis, as well as a new two-way interaction involving Ethnicity (Anglo vs. Chinese) and Class (MC vs. LMC). Furthermore, I incorporated the two-way interactions between Ethnicity and three linguistic factors, including Tense, Determiner Type, and Extension, aiming to evaluate whether the variable grammar of (THERE'S) is shared between Anglo and Chinese Australians. I compared the results of these two models to unpack the class effect and its interaction with ethnicity. Therefore, the maximal model comprised two three-way interactions (Class * Tense * DeterminerType + Tense * DeterminerType * Extension) and four two-way interactions (Ethnicity * (Class + DeterminerType + Tense + Extension)).

The final model predicting the variation between THERE'S and THERE ARE is summarised in Table 20[26]. The interaction between ethnicity and class is not significant, nor are there significant main effects of these factors. These results indicate that when only considering the differences between LMC and MC speakers without the interference of WC speakers, the Chinese Australians are very similar to the Anglo Australians in not showing a class effect. However, there is a significant interaction between Ethnicity and Determiner Type. Among all the linguistic factors included, Tense shows a significant main effect. Unlike what we observed in the apparent time analysis, there is no significant interaction between Tense and Class when the Chinese Australians are included in the model. This suggests that the class differentiation between the MC and the LMC, coupled with the tense effect for Anglos of different age groups, is not replicated in the English of Young Adults from different ethnic backgrounds.

[26] Formula: glmer(Realisation ~ Tense + Ethnicity * DeterminerType + (1|Speaker)

Table 20 Model summary for the regression on the realisation of THERE'S (vs. THERE ARE) for Young Adult Anglo and Chinese Australians.

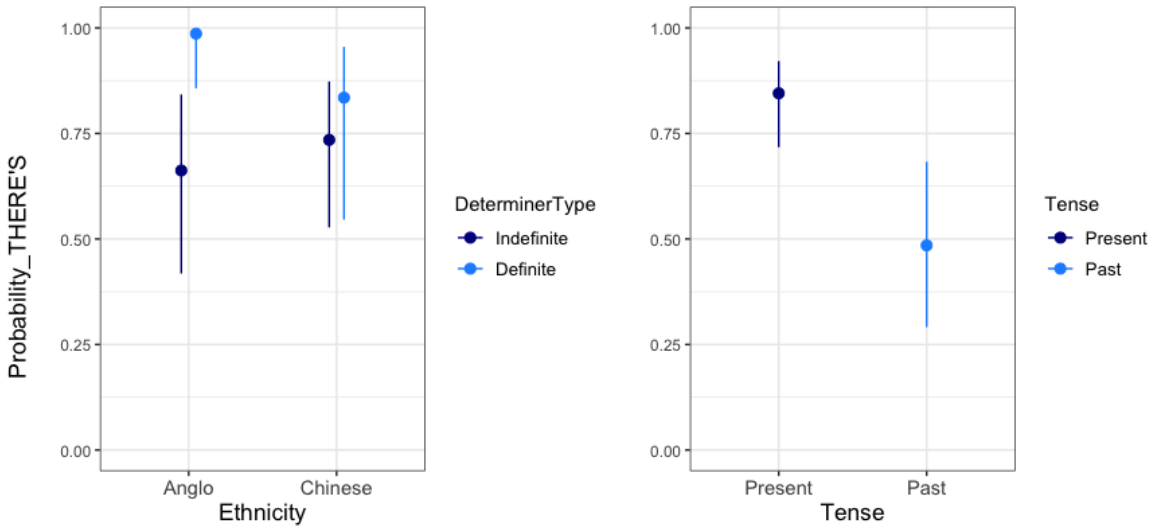
	Estimate	Std. Error	z value	Sig.
Intercept	1.13	0.52	2.15	<0.05
Tense Present vs. **Past**	-1.74	0.41	-4.22	<0.001
Ethnicity Anglo vs. **Chinese**	0.38	0.67	0.56	0.574
DeterminerType Indefinite vs. **Definite/Number**	3.62	1.21	2.99	<0.01
Ethnicity Anglo vs. **Chinese**: DeterminerType Indefinite vs. **Definite/Number**	-3.02	1.37	-2.20	<0.05

For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of THERE'S.

Overall rate of THERE'S is 69% (218/314). 38 speakers, Speaker variance = 2.937 (*SD* = 1.714); Log likelihood: -153.4; AIC: 318.7; BIC: 341.2. No significant effects for Class and Extension.

There is a significant interaction between ethnicity and determiner type, which is visualised in the left panel of Figure 55. The horizontal axis distinguishes two ethnic groups: Anglo on the left and Chinese on the right. Determiner type is differentiated by colour. We see that the direction of the effect of determiner type is the same for both Anglo and Chinese Australians, with THERE'S being favoured by definite/number determiners. Although this effect is only present among the Anglos, the Chinese demonstrate a similar pattern. The distribution of the data shows that for the Young Adults Anglo Australians (setting aside the WC), 96% of tokens with definite/number determiners are realised as THERE'S (26/27) while 59% with indefinite determiners are realised as THERE'S (72/123). However, for the Chinese Australians, 81% of tokens with definite/number determiners are realised as THERE'S (22/27) while 72% with indefinite determiners are realised as THERE'S (98/137). Thus, we see that the definiteness effect is stronger for the Young Adult Anglo Australians. In the right panel of Figure 55, the main effect of Tense shows that THERE'S is favoured in present tense contexts, a pattern consistent for both ethnic groups.

Figure 55 Effect plots of the interaction between Ethnicity and Determiner Type and the main effect of Tense for THERE'S (vs. THERE ARE) for Young Adult Anglo and Chinese Australians.



To summarise what we have seen, there are no significant main effects observed for age and class, nor is there an interaction between these two factors. However, a separate analysis shows that there is a class effect only for the Adult Anglos, exhibiting a gradual weakening in the favouring effect of THERE'S from the WC to the LMC to the MC. The Chinese Australians and both age groups of Anglo Australians are the same in the absence of class differentiation between the LMC and MC speakers. In terms of linguistic conditioning, the effects of two grammatical factors, tense and determiner type, are shared by all groups of speakers with present tense and definite/number determiners favouring THERE'S. However, in the apparent time analysis, class interacts with tense. While the WC favour THERE'S in both present and past temporal reference contexts, the LMC and MC exhibit opposite effects in these two temporal reference contexts. In the second model analysing the ethnic differentiation between Chinese and Anglo Australians, ethnicity interacts with determiner type. Young Adult Anglos show a favouring effect of THERE'S with definite/number determiners, while the Chinese show no such effect. The effects of three psycholinguistic processing factors are not important in Australian English, as none of the models select them to be significant predictors of (THERE'S). These patterns suggest that (THERE'S) is an advanced change in Australian English. The loss of the class effect over time was observed in both the Young Adult Anglos and the Chinese, elucidating the similarity in their usage rates of THERE'S, despite its prior association with the working class.

6.6.3 Assessing ethnic orientation of the Chinese

So far, we have seen little in the way of ethnic differences, aside from an interaction between ethnicity and determiner type. As depicted in the left panel of Figure 55 above, although the effect direction of determiner type aligns similarly for Young Adult Anglos and Chinese, it only applies among Young Adult Anglos. To validate the absence of an ethnicity effect—whether as a categorical variable or considering its more nuanced measures such as ethnic orientation, social network, Cantonese proficiency, and Cantonese-speaking density in the suburb—I conducted four separate regression models, each addressing these aspects individually. In each model, Class, Tense, and Determiner Type were included as main effects to facilitate comparison with the results presented in Table 20 above.

None of the ethnic background measures exhibit any significant effects, further confirming our earlier observation that there is minimal ethnic variation in (THERE'S) in the English of Chinese Australians. Additionally, as there were no effects of the ethnic background measures on *the*+VOWEL and future temporal reference, these findings collectively suggest that the ethnic differences apparent in the English of Chinese Australians cannot be attributed to ethnic identity marking.

The only significant effect observed is related to tense, which is summmaried in Table 21. The main effect of tense reveals a preference for THERE'S in present temporal reference contexts over past temporal reference contexts. This aligns with the previous findings when considering both Young Adult Anglos and Chinese. Similar to our prior observations, no Class effect has been found for the Chinese here.

Table 21 Model summary for the regression on the realisation of THERE'S (vs. THERE ARE) for Chinese Australians.

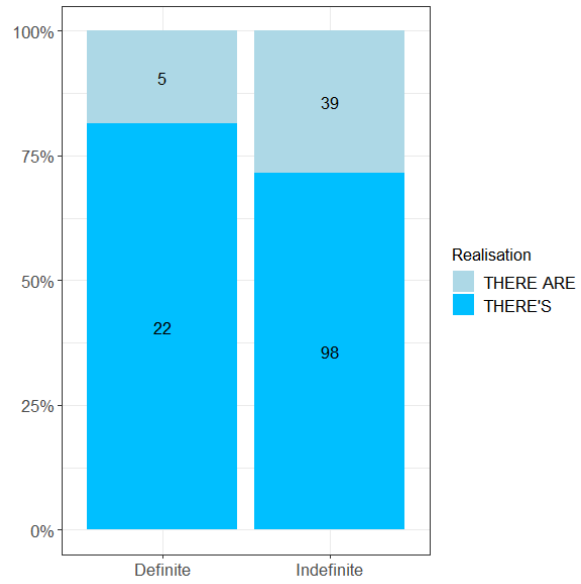
	Estimate	Std. Error	z value	Sig.
Intercept	1.45	0.42	3.42	<0.001
Tense$_{\text{Present vs. }\textbf{Past}}$	-1.37	0.52	-2.61	<0.01

For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of THERE'S.

Overall rate of THERE'S is 73% (44/164). 21 speakers, Speaker variance = 2.026 (*SD* = 1.423); Log likelihood: -84.3; AIC: 174.6; BIC: 183.9. No significant effects for Class, EOI, Social Network, Cantonese Proficiency, Cantonese-speaking Density in the Suburb, and Determiner Type.

For determiner type, though there is no significant effect, its effect direction remains consistent with our previous observations, indicating a higher rate of THERE'S with definite/number determiners compared to indefinite determiners, as seen in Figure 56. Notably, the token numbers in this distribution are skewed, with only 27 tokens featuring definite/number determiners. Thus, we conclude that the variable grammar associated with (THERE'S) is indeed shared between Young Adult Anglos and Chinese.

Figure 56 Distribution of DeterminerType for *be going to* (vs. *will*) for Chinese Australians.



6.6.4 Hong Kong English

We saw above in Figure 43 that the rate of THERE'S in Hong Kong English is notably lower compared to any group of Australians. This suggests that the language transfer effect from Cantonese, which would have resulted in a significantly lower rate of THERE'S in the English of Chinese Australians, is not observed. However, in the second model focusing on Young Adults, I do find an effect for ethnicity in interaction with Determiner Type. The definiteness effect only holds for Young Adult Anglo Australians. If this is due to transfer from Cantonese, then we should find a lack of an effect for Determiner Type in ICE-HK. To explore this, I will now examine the linguistic patterns in Hong Kong English and compare them to those in Australian English.

For Hong Kong English, I included the main effects of Determiner Type and Extension. As depicted in Figure 46, due to the limited number of tokens in past temporal reference contexts

(only 12), I cannot include Tense as a predictor in the regression model for Hong Kong English. However, similar to the Australians, the people of Hong Kong tend to use THERE'S more frequently in present rather than past temporal reference contexts (26% vs. 8%). I compared the patterns in Hong Kong English with those in Australian English to assess the language transfer effect from Cantonese and the exposure to Hong Kong English on the English of Chinese Australians.

Extension was the only significant factor in the conditional inference tree for Hong Kong English, but I also included Determiner Type (except Tense due to its skewed distribution) in the regression model to compare their effects with those in Australian English[27]. Thus, the maximal model included (Extension + Determiner Type).

Table 22 summarises the results of the final model for the Hong Kong English data[28]. Much like the findings from the conditional inference tree, there is no effect of DeterminerType. However, I observe a significant main effect of Extension, the direction of which is visualised in Figure 57. This figure illustrates that the absence of an extension favours THERE'S over the presence of an extension. Thus, we can conclude that Hong Kong English differs from Australian English, as the variable grammar between these two varieties is subject to distinct linguistic constraints.

Table 22 Model summary for the regression on the realisation of THERE'S (vs. THERE ARE) in Hong Kong English.

	Estimate	Std. Error	z value	Sig.
Intercept	-1.55	0.25	-6.29	<0.001
Extension$_{\text{Presence vs. }\textbf{Absence}}$	0.89	0.34	2.63	<0.01

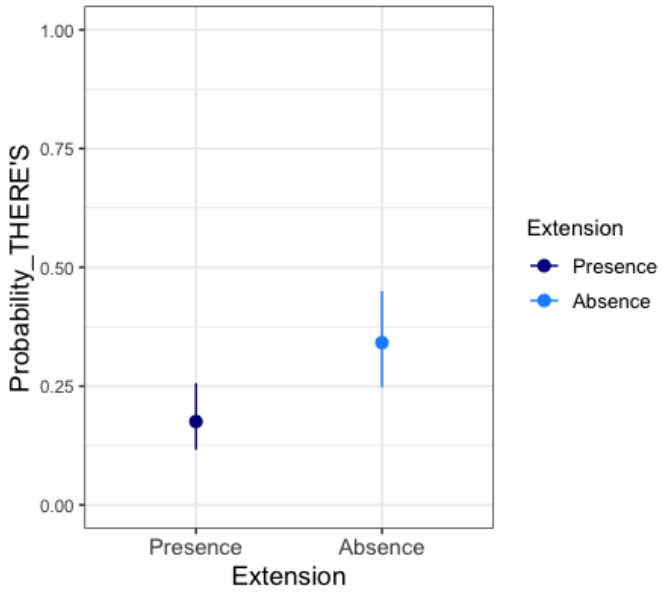
For each predictor, the reference level is indicated on the left, with the predicted level shown on the right in bold. Positive coefficients are associated with a higher rate of THERE'S.

Overall rate of THERE'S is 24% (48/196). 82 speakers. AIC: 215.2. No significant effect for Determiner Type.

[27] When including Speaker as a random effect, the Speaker variance was 0, so I did not include it in the regression model here.

[28] The formula is glm(Realisation ~ Extension).

Figure 57 Effect plot of Extension for THERE'S (vs. THERE ARE) in Hong Kong English.



In summary, I observe different tendencies in linguistic factors between Australian English and Hong Kong English, indicating that the variable grammar in both varieties is not shared. The most notable linguistic factor that distinguishes Hong Kong English from Australian English is Extension. If language transfer exists in the English spoken by Chinese Australians, we would anticipate observing an effect of Extension. However, such an effect is not evident. Moreover, similar to what we observed in ICE-HK, there is a lack of an effect for Determiner Type in the English of Chinese Australians. Is this absence of effect attributable to a transfer effect? Further examination may be required as there are only 27 tokens of definite/number determiners used by Chinese Australians, displaying similar patterns to both Anglo Australians and speakers of Hong Kong English – higher usage rates of THERE'S with definite/number determiners. Overall, these findings suggest that language transfer from Cantonese or Hong Kong English is unlikely to be a factor influencing the English of Chinese Australians.

6.7 Discussion and conclusion

Australian English differs from Hong Kong English in the rate of use of THERE'S. The Australians use THERE'S at a much higher rate than Hong Kong English speakers (68% vs. 24%), indicating that Hong Kong English lags behind in this change. The contracted form *there's* is the most frequent variant of the singular form THERE'S in both Australian English (299/407, 73%) and Hong Kong English (36/48, 75%), which is consistent with findings in other varieties of English (e.g., Breivik & Martinez Insua, 2008; Walker, 2007, 2021).

Regarding linguistic conditioning, Australian English and Hong Kong English share the effect of tense, with THERE'S being favoured in present tense contexts, consistent with findings in other studies of different varieties and groups of speakers (e.g., Britain & Sudbury, 2002; Collins, 2012). However, the effect of determiner type is only significant in Australian English, where definite/number determiners favour THERE'S, while this effect is not observed for Chinese Australians. While processing factors do not have significant effects in Australian English, in Hong Kong English, the absence of an extension favours THERE'S. In the case of three groups of Australian English speakers, the rate of THERE'S is also higher when the extension is present. This pattern of usage aligns with what is observed among Hong Kong English speakers, although the difference in usage does not reach statistical significance. This suggests that extension is an older predictor of (THERE'S) as it exists in Hong Kong English only. As we cannot compare the older conditioning, we do not know how that has changed over time in Australian English. One conclusion we can draw here is that Australian English and Hong Kong English are subject to substantially different linguistic conditioning.

In terms of social conditioning, in Australian English, age does not show a main effect or any interaction effect with other social factors, suggesting that the variation of (THERE'S) and its social conditioning has stabilised over time. That is, the change of (THERE'S) is no longer ongoing. This is further supported by the absence of significant effects observed in any of the processing factors. In terms of the class effect, in the 1970s data, there was a strong class effect for the Adults, with the WC speakers favouring THERE'S. This class stratification was attenuated over time as the three class groups of Teens used similar rates of THERE'S. Similarly, in the 2010s data here, both Young Adult Anglo and Chinese Australians do not show class effects, but there is a class effect only for Adult Anglo Australians, with the WC Adult Anglos using THERE'S at a higher rate than the LMC and MC speakers who do not differ from each other, further suggesting the loss of class effect over time. Collectively, these patterns indicate an age-conditioned class stratification present in Australian English. Older speakers tend to maintain the class effect, while younger speakers do not exhibit the same degree of class stratification, which mirrors findings observed in American English (Krejci & Hilton, 2017). Furthermore, there is an interaction between class and tense for Anglo Australians, indicating that the Anglos from different class groups use THERE'S differently in various temporal reference contexts. Overall, these results suggest that the timing of change of (THERE'S) is very advanced in Australian English.

The significant interaction between ethnicity and determiner type indicates that the Chinese Australians may not be the same as the Anglo Australians in linguistic conditioning (cf., Walker,

2021, p. 176). As we saw in Figure 55, although the effect of determiner type is stronger for the Anglo Australians than that for the Chinese, its direction is the same between the two groups, suggesting little supporting the previous findings that the Chinese Australians are not being linguistically ethnolectal (Grama, Travis, & Gonzalez, 2020, 2021). Furthermore, consistent with the previous analyses of *the*+VOWEL and future temporal reference, in the separate regression models on four measures of ethnic background within the Chinese dataset, none of these measures demonstrated any significant effects. This further supports the notion that ethnic identity marking does not significantly contribute to the variation of (THERE'S) among the Chinese.

In summary, these patterns in Australian English show that for (THERE'S), its linguistic conditioning is retained over time and is substantially shared between the Anglo and Chinese Australians. The social standing of the Adult Anglo Australians differentiates the WC speakers from speakers of higher socioeconomic status. The Chinese pattern similarly to their Anglo peers in showing no class differentiation. For all three groups, there is not class differentiation between MC and LMC speakers. Thus, we conclude that the Chinese Australians are part of the middle-class oriented community in Australia who have adopted the LMC and MC norms in the speech of Anglo Australians. An aspect requiring further exploration is the impact of ethnic orientation. Despite none of its measures showing significance in the regression models, it is worth noting that the Chinese tend to use THERE'S at a slightly higher rate than Anglo Australians. These measures will be re-examined in Chapter 7 through correlation tests. Correlation tests are better suited for handling our smaller dataset, given that we only have 22 Chinese Australians in the sample, with one speaker not producing any tokens of (THERE'S).

Chapter 7 Revisiting Ethnic Orientation of the Chinese

As discussed in Section 2.5, ethnicity has been approached differently across various studies. In this thesis, ethnicity has been operationalised in two ways – either as a categorical variable or as a continuum. Among the regression models applied to examine linguistic variables in this thesis, only future temporal reference demonstrates a significant association with ethnicity. However, none of the measures related to the ethnic background of Chinese Australians exhibit any significant effects. Consequently, I aim to reassess the influence of ethnic background measures on speech patterns among Chinese Australians by employing an alternative methodology. First, I will revisit the timing of change across variables to better contextualise Chinese Australians within a broader framework using this alternative methodology.

7.1 Revisiting timing of change across variables

The three sociolinguistic variables analysed in this thesis demonstrate different timing in terms of the change each has undergone. The most recent of these is *the*+VOWEL. For this variable, the Adult Anglos show little variability, predominantly using non-glottalised FLEECE to the exclusion of both glottalised FLEECE and schwa, while the Young Adult Anglos exhibit a significant increase in both glottalised FLEECE and schwa and a substantial drop in the rate of non-glottalised FLEECE.

The second variable examined in this study is future temporal reference, where there is a shift towards *be going to* at the expense of *will* over time, a change observed in nearly every variety of English (e.g., Denis & Tagliamonte, 2018; Fehringer & Corrigan, 2015; Poplack & Tagliamonte, 1999). This change has been ongoing for a longer period than *the*+VOWEL. Here, the Adults use a reasonable rate of *be going to* (which is distinct from glottalised FLEECE and schwa), the Young Adult Anglos exhibit a significantly higher rate of use, indicating that the future temporal reference system is a well-established change that may be ongoing in Australian English.

The third variable analysed is (THERE'S), which involves the variants plural THERE ARE and singular THERE'S occurring with a plural argument. For this variable, both the Adult Anglos and the Young Adult Anglos exhibit similarly high rates of THERE'S (over 60%), indicating no apparent time change in the rate of use today. However, there has been an increase in the singular form THERE'S in apparent time in the Sydney Social Dialect Survey data collected in

the 1970s (El-Khaissi, 2017), revealing rates of 38% for Adults and 70% for Teens. These patterns suggest an advanced status of (THERE'S) in Australian English.

In summary, the change for *the*+VOWEL towards glottalised FLEECE and schwa is ongoing and recent; the change for future temporal reference towards more frequent use of *be going to* vs. *will* is a well-established yet ongoing change; and the change towards THERE'S vs. THERE ARE appears to be quite advanced, and the lack of an apparent time difference indicates that it is not ongoing. This leads to different predictions for the Chinese Australians. If they were to be consistently leading these changes, they would be predicted to use higher rates of both glottalised FLEECE and schwa for *the*+VOWEL and a higher rate of *be going to* for future temporal reference, as these two variables are ongoing, but a parallel rate of THERE'S with the Anglo Australians as this change is not ongoing. Consistent with these predictions, the results indicate that the Chinese Australians have higher rates of both glottalised FLEECE and schwa for *the*+VOWEL and are parallel to the Anglo Australians for THERE'S. However, they have a lower rate of *be going to* for future temporal reference, suggesting that they are behind in this change. Thus, the Chinese Australians do not lead in all of these changes.

Analysing the timing in terms of the change each has undergone based solely on overall rates presents a challenge, as the distributions of variants are substantially influenced by their linguistic and social conditioning (Drager & Hay, 2012, p. 64). To further consider whether the patterning of the Chinese Australians is in relation to these changes, I adopt an alternative approach not based on the overall rates but on the random intercept scores of the Speaker in the mixed-effects logistic regression models presented thus far in the individual chapters, following the methodology outlined in Drager and Hay (2012), Haddican, Newman, Cutler and Tortora (2021) and Haddican, Cutler, Newman and Tortora (2022).

As we have seen in the chapters so far, I conducted independent mixed-effects logistic regression models for each variable, incorporating Speaker as a random effect using the *glmer* function in the *lme4* package in R (Bates, Mächler, Bolker, & Walker, 2015). For *the*+VOWEL models, I also included Word as a random effect. For the current chapter, I ran identical models to those reported in the relevant analysis chapters concerning the apparent time analysis of Anglo Australians, but excluding social predictors. In doing so, my aim is to control for the linguistic conditioning effects of each variable while not controlling for participant-related effects such as age, gender, and class, which are the main focus when gauging the timing of change (Haddican, Cutler, Newman, & Tortora, 2022, p. 516). The final regression model structures that include only the significant predictors for each variable are outlined below:

the+VOWEL: glottalised FLEECE (predicted level) vs. non glottalised FLEECE

Realisation1 ~ SyllableStress * FollowingVowel + (1|Speaker) + (1|Word)

the+VOWEL: schwa (predicted level) vs. non glottalised FLEECE

Realisation2 ~ SyllableStress * FollowingVowel + TransProb + (1|Speaker) + (1|Word)

future temporal reference: be going to (predicted level) vs. will

Realisation3 ~ Clause * Polarity + Subject + (1|Speaker)

(THERE'S) + plural argument: THERE'S (predicted level) vs. THERE ARE

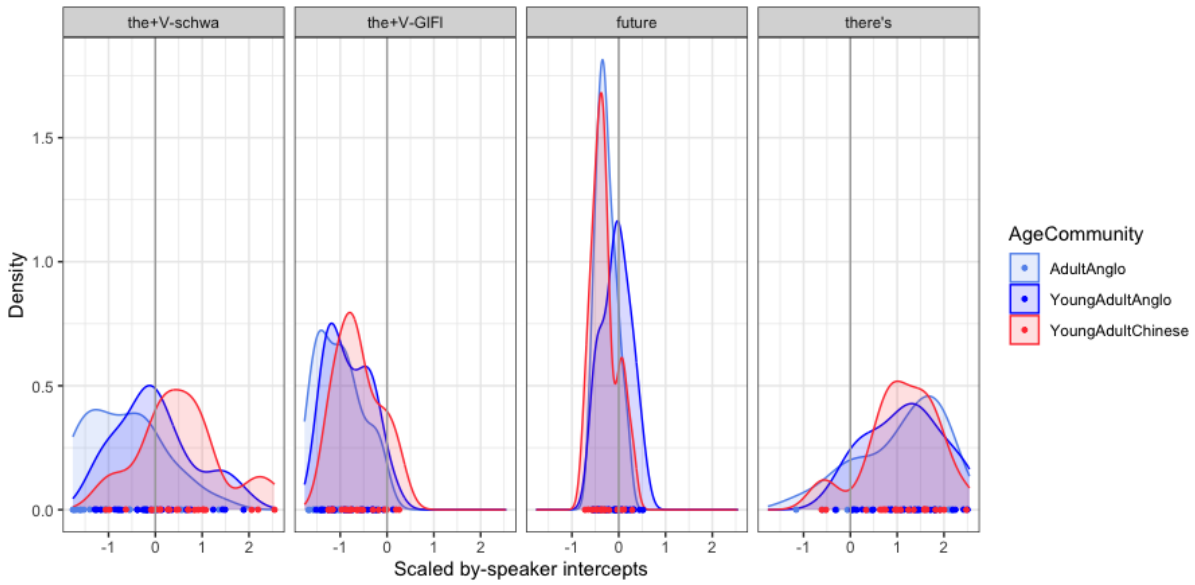
Realisation4 ~ Tense + DeterminerType + (1|Speaker)

In order to be able to compare the Speaker estimates across these variables which are each on a different scale, I first standardised the data using the *scale* function in R, by converting each original value into a *z*-score, as suggested by Haddican, Cutler, Newman and Tortora (2022, p. 516).

To visually depict the distributions of the variables across the three Australian groups, I utilised the density plot, a variation of a histogram that uses kernel smoothing to represent values, enabling smoother distributions, and reducing noise. The results are presented in Figure 58, with the distribution of the Adult Anglos shown in light blue, the Young Adult Anglos in dark blue, and the Young Adult Chinese in red. The dots stand for individual speakers. The four panels present the distributions of *the*+VOWEL-schwa, *the*+VOWEL-glottalised FLEECE (GlFl), future temporal reference (Future), and (THERE'S) respectively. As not every speaker produced all variables, there are different numbers of speakers for each variable. Out of the total of 75 speakers in the sample (27 Adult Anglo Australians, 26 Young Adult Anglo Australians, and 22 Young Adult Chinese Australians), all produced instances of *the*+VOWEL-schwa and were included in the model, and 73 were included in the *the*+VOWEL-FLEECE model; for future temporal reference, 67 speakers were included; and for (THERE'S), 72 speakers were included.

The skewness, which measures the symmetry of the distribution, differs across the variables. A right-skewed distribution indicates a preference for the newer variants (predicted levels in the regression models), namely schwa, glottalised FLEECE, *be going to*, and THERE'S, while a left-skewed distribution indicates a preference for the older variants, namely non-glottalised FLEECE (in both *the*+VOWEL models), *will*, and THERE ARE. The peaks of the density plots indicate where values are concentrated within the interval.

Figure 58 Density plots of the distributions of variables across groups, based on by-speaker random intercepts from four models.



As shown in the first two panels on the left, concerning the more recent change, *the*+VOWEL, the two newer variants show differences across groups. For both variants, the Adult Anglo Australians display left-skewed distributions, indicating a preference for the older form of non-glottalised FLEECE. In contrast, the Young Adult Anglos are slightly positioned to the right of the Adults. The Chinese Australians are located even further to the right, particularly noticeable in the case of schwa. These results are consistent with what we have seen thus far, that this is a change in progress and the increase of schwa and glottalised FLEECE is more pronounced among the Chinese Australians.

For future temporal reference, the peak stands out, as the distribution of this variable is more condensed with the majority of speakers sharing similar rates of *be going to.* However, the Chinese and Adult Anglo Australians display slightly left-skewed distributions, while the Young Adult Anglo Australians exhibit a more balanced distribution. This indicates that the Chinese Australians align more closely with the previous generation in their usage of this variable compared to their Anglo peers, consistent with the previous findings in Chapter 5 that the Chinese Australians lag behind in the change away from *will* towards *be going to.*

Regarding the advanced change, THERE'S (vs. THERE ARE), shown in the fourth panel, all three groups exhibit parallel, right-skewed distribution, indicating a universal preference for the newer, singular form across the groups. This finding also aligns with the previous results in

Chapter 6, where no apparent time change or effect of ethnicity were found in the regression models.

In summary, based on the random intercepts by Speaker from the four models, the distribution of variables reinforces the earlier findings regarding the roles of the Chinese Australians in these changes. They are more likely to use the newer variants schwa and glottalised FLEECE for *the*+VOWEL, less likely to use *be going to* for expressing future temporal reference, and are parallel to the Anglo Australians for THERE'S, and this holds, even when the linguistic conditioning is taken into account. This confirms that the Chinese Australians participate to different degrees in these changes.

Thus far, we have not seen any impact of different measures of ethnic background in the regression models. I therefore conduct one further test – I reexamine these measures using speaker random effects as the data and employ correlation tests to analyse it. Correlation tests are more adept at handling our smaller dataset, as we only have 22 Chinese Australians in the sample, and not all of them produce all three variables under examination, as reported above.

7.2 Revisiting ethnic background of the Chinese

In line with the regression models conducted on ethnic background measures in each analysis chapter above, the consideration here is whether, beyond ethnicity per se, there might be an effect for the degree to which individuals orient to their ethnic heritage. Here, rather than considering all the Chinese Australians in a single group, I examine potential differences among them to test whether Chinese Australians who exhibit a stronger affinity for Chinese culture and lifestyle may differ from those who are more oriented towards mainstream Anglo society through correlation tests. That is, do greater ethnic differences emerge for those with higher ethnic orientation (cf., Hoffman & Walker, 2010)?

Here, I consider four different measures of ethnic background: Ethnic Orientation, social network, heritage language proficiency, and Cantonese-speaking density in the suburb (e.g., Cheshire, Fox, Kerswill, & Torgersen, 2008; Cox, Penney, & Palethorpe, 2023; Hoffman & Walker, 2010). The predictions for the Chinese community in Australia are that if their ethnic orientation to the Chinese culture and lifestyle is stronger, their social network is more Chinese dominant, their Cantonese proficiency is higher, and there is more Cantonese spoken in the suburbs they live in, they will differ more from their Anglo counterparts and specifically be more likely to use the newer variants of the ongoing changes of *the*+VOWEL and future temporal

reference. For (THERE'S), which is not an ongoing change in Australian English, the prediction is that there would not be any effect of the measures of ethnic background.

As introduced in Chapter 3, the participants are situated at different points along these scales, but statistical tests reveal that they are not significantly different from one another. In the earlier chapters, I investigated the impacts of these measures using regression models, yet none revealed significant effects. Now, I reexamine these measures using speaker random effects as the data and employ correlation tests to analyse it.

For these correlation tests, the scores that are entered in for each linguistic variable represent the value of the Speaker random effect, extracted from the mixed-effects regression models, and then scaled as reported in Section 7.1. I performed Shapiro-Wilk normality tests on the distributions of all ethnicity measures to determine the appropriate correlation tests for data analysis. The results indicated that EOI, Cantonese-speaking density in the suburb, and social network were normally distributed, allowing the use of Pearson Correlation Tests to assess their correlations with the variables under consideration; as Cantonese proficiency had a non-normal distribution, a Spearman rank-order correlation test was conducted.

Table 23 presents the correlations between the values from the random effects of Speaker and the variables under investigation, broken down by speaker. First, note that there is no significant correlation between any measure of ethnic background and any of the linguistic variables, consistent with what we have seen in the regression analyses. Nevertheless, it may be difficult to achieve significance as there are just 22 data points, one for each speaker. We can also compare the values of *r* to assess the effect sizes of the correlations. According to Cohen (1992, p. 99), the effect size is low if the value of *r* is around 0.1, medium if *r* is around 0.3, and large if *r* is more than 0.5. The effect sizes for most measures are low, with nothing exhibiting a large effect size. However, there are some measures with medium effects, notably the correlation between EOI and *the*+VOWEL_schwa ($r = 0.347$) as well as the correlations between Cantonese proficiency and *the*+VOWEL_schwa ($r = 0.341$) and (THERE'S) ($r = 0.313$). Moreover, understanding the direction of effects, whether positive or negative, contributes to interpreting the results, best depicted through visualisations. Therefore, Figure 59 and Figure 60 present visualisations of the two measures exhibiting medium effect sizes.

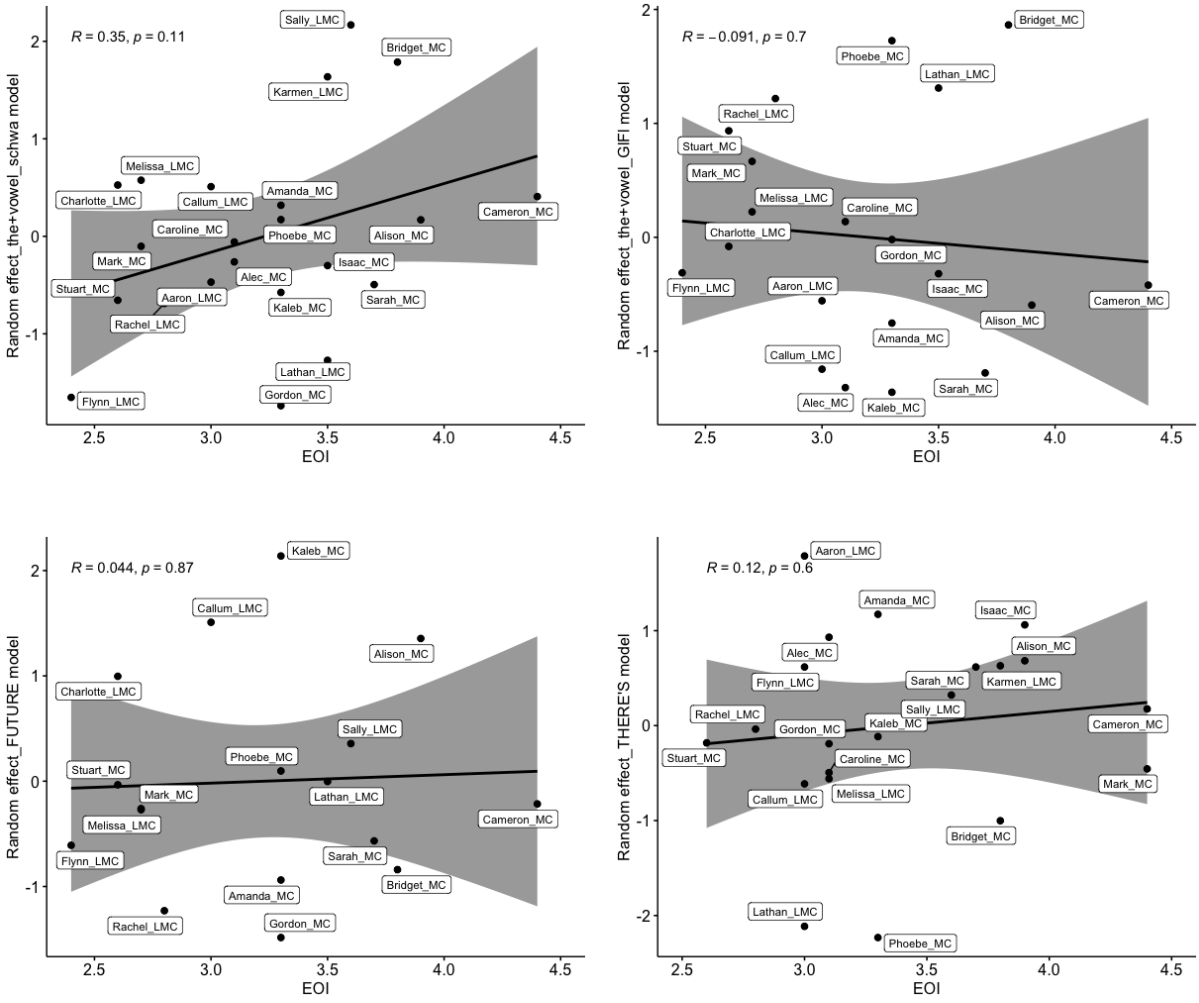
Table 23 Correlations between measures of ethnic background and the variables.

	***the*+V_schwa**	***the*+V_GlFl**	**Future**	**(THERE'S)**
Ethnic orientation	$r(20) = 0.347$, $p = .113$	$r(18) = -0.091$, $p = .703$	$r(15) = 0.044$, $p = .866$	$r(19) = 0.121$, $p = .603$
Language spoken in suburb	$r(20) = -0.095$, $p = .673$	$r(18) = 0.265$, $p = .259$	$r(15) = 0.178$, $p = .495$	$r(19) = 0.017$, $p = .943$
Social network	$r(20) = -0.074$, $p = .745$	$r(18) = 0.084$, $p = .724$	$r(15) = -0.091$, $p = .729$	$r(19) = 0.220$, $p = .338$
Cantonese proficiency	$r_s = 0.341$, $p = .120$	$r_s = 0.086$, $p = .720$	$r_s = -0.169$, $p = .517$	$r_s = 0.313$, $p = .167$

I first consider Ethnic Orientation. Figure 59 presents four visualisations illustrating the correlation between the linguistic variables and ethnic orientation in the English of Chinese Australians. In these plots, the vertical axes represent the scaled score of the Speaker random effect for each variable, with higher scores indicating greater use of the newer variants (schwa, glottalised FLEECE, *be going to*, and THERE'S) and the horizontal axes represent ethnic orientation, with higher scores (further to the right) indicating a higher orientation towards Chinese heritage and culture.

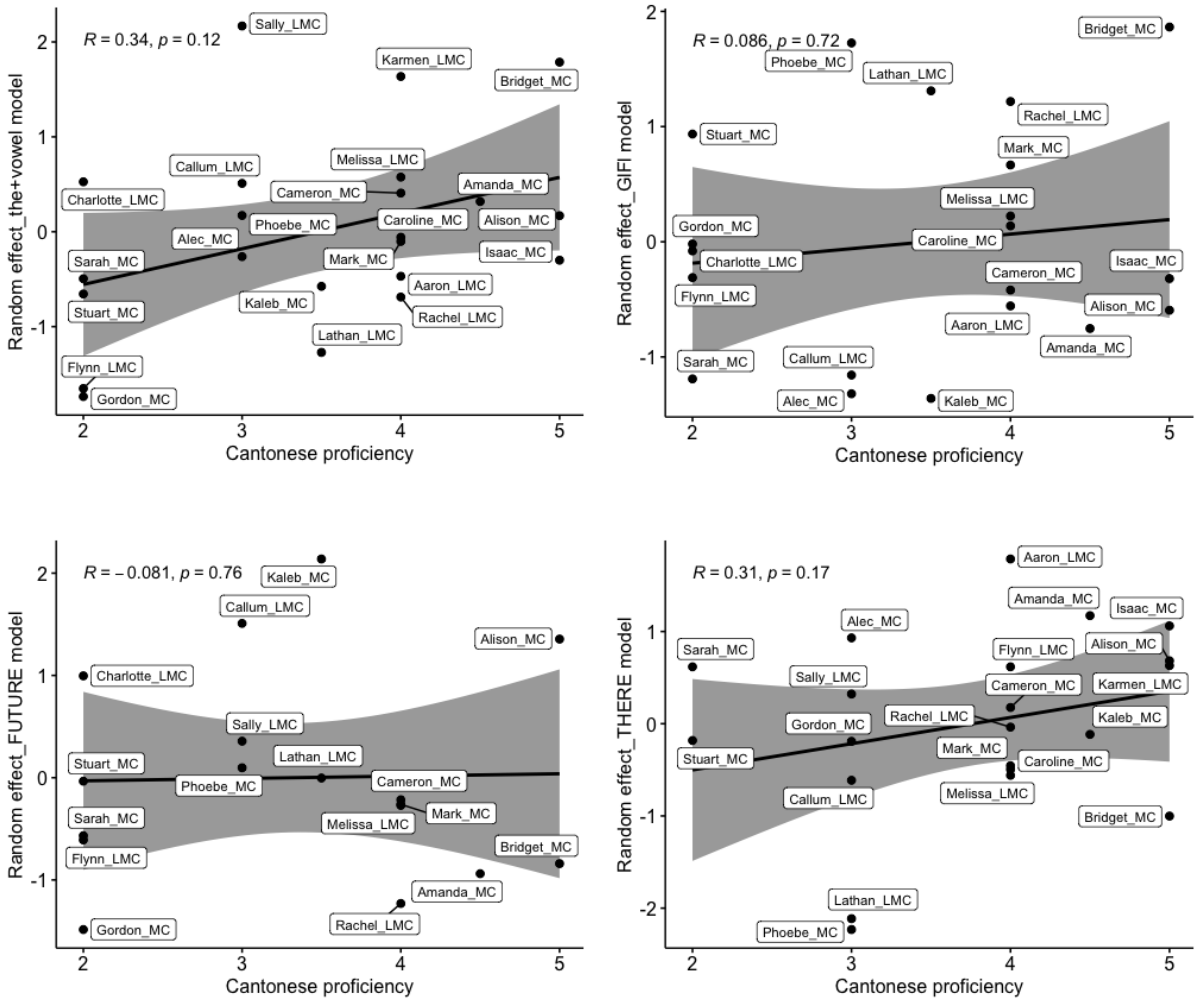
In the top left panel of Figure 59, an upward slope is evident, reflecting the medium strength of the correlation seen in Table 23 suggesting a tendency for stronger Chinese orientation to correspond to a greater use of schwa. All other charts have relatively flat lines, reflecting the lack of correlations seen in Table 23, or that ethnic orientation does not influence the usage of these linguistic variables.

Figure 59 Plots of correlations between three linguistic variables and ethnic orientation.



As shown in Table 23, the correlations between self-reported Cantonese proficiency and *the*+VOWEL_schwa and (THERE'S) also have medium effect sizes. The visualisations for these correlations are depicted in Figure 60. The correlation between schwa and Cantonese proficiency is shown in the top left panel, where we see an upward slope, as was also seen with EOI in Figure 59, reflecting the medium effect size, and that a higher level of Cantonese proficiency corresponds to an increased use of schwa. For (THERE'S) also, in the bottom right panel, there is an ascending slope, suggesting that higher Cantonese proficiency is associated with an elevated use of the singular THERE'S. In contrast, in the top right panel (glottalised FLEECE) and bottom left panel (*be going to*), the flat lines reflect the lack of a correlation with Cantonese proficiency.

Figure 60 Plots of correlations between three linguistic variables and Cantonese proficiency.

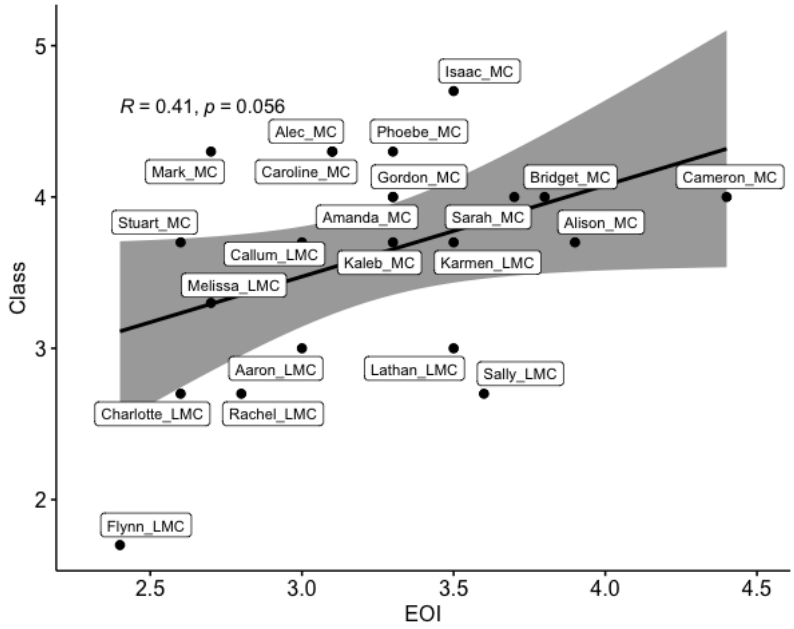


The tendency for *the*+VOWEL-schwa and higher Cantonese proficiency is consistent with what we saw for the correlation with higher Ethnic Orientation. The effect for (THERE'S) is surprising because there are no ethnic differences for (THERE'S).

It is important to note that in Chapter 5, a significant effect of ethnicity was observed for future temporal reference, but not for any other variables. However, in the correlation tests conducted here, all measures of ethnic background show little correlations with future temporal reference, and the effect sizes are all low (*r*s < 0.2), as shown in Table 23. This suggests that the previously observed ethnic effect in the regression analysis, where Chinese Australians use *be going to* at a significantly lower rate than their Anglo peers, is not attributed to ethnic identity marking. While Hoffman and Walker found a correlation between rates of use and EOI for the Chinese community in Canada (Hoffman & Walker, 2010, pp. 54-56), this is not replicated within the Chinese community here in Australia.

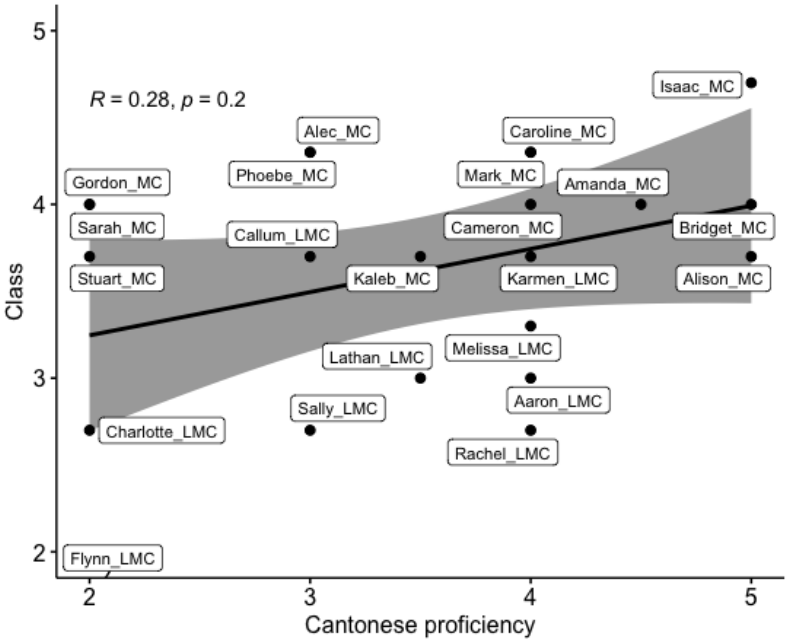
To explore this further, I test for a possible correlation between EOI and social class (here run as a continuous variable), depicted in Figure 61. I find a positive correlation with a correlation coefficient (r value) of 0.41 and a marginally significant effect (p = 0.056); that is, Chinese Australians with a stronger orientation towards Chinese culture and lifestyle tend to be situated at the higher end of the social class spectrum.

Figure 61 Plot of correlation between social class and ethnic orientation index.



What about Cantonese proficiency? Figure 62 shows the correlation test results between Cantonese proficiency and social class, which indicate a positive slope, though this correlation is relatively weaker compared to that for ethnic orientation, as evidenced by the lower r value of 0.28 and it does not even approach significance (p = 0.2). Nevertheless, the direction of effect does align with what we saw for Ethnic Orientation, with those of higher socioeconomic status tending to have greater Cantonese proficiency.

Figure 62 Plot of correlation between social class and Cantonese proficiency.

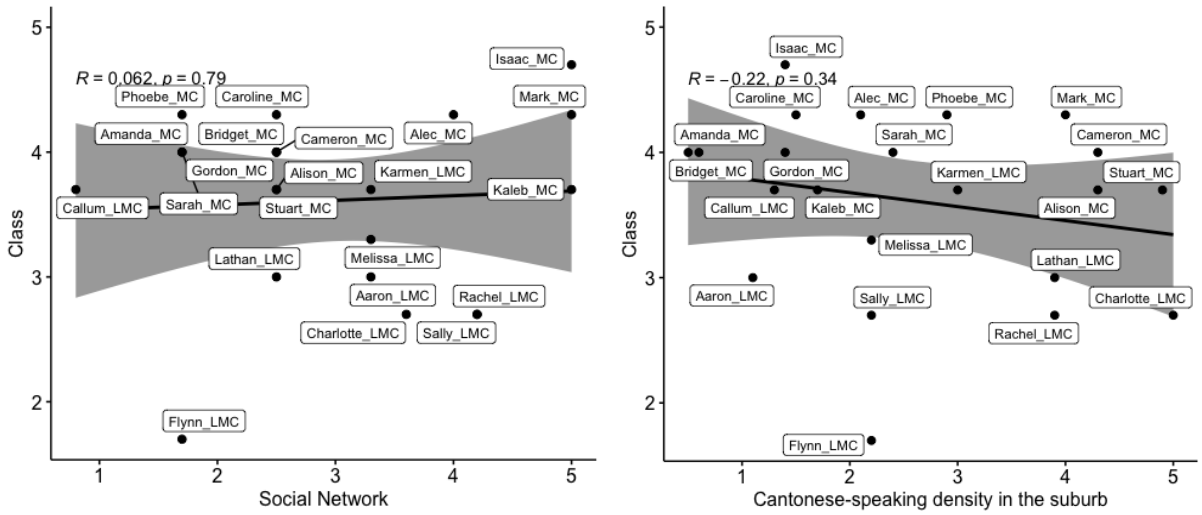


Let us also consider the correlations between the other two measures and social class. As depicted in the left panel of Figure 63, the flat line indicates that there is little correlation between social network and social class. Furthermore, the r value is lower than 0.1, and the *p* value is close to 1, which further suggests that social network does not correlate with social class. These patterns indicate that social network, one component of EOI, has a very limited contribution to the correlation between EOI and social class.

The final measure is Cantonese-speaking density in the suburb. It is associated with social network but is not included as a component of EOI. Table 23 indicates that, similar to social network, it exhibits minimal correlations with all the variables. To determine if it differs from EOI measures and whether it correlates with social class, I conducted a correlation test on it. As illustrated in the right panel of Figure 63, the r value is less than 0.3, and the p value is 0.34, suggesting a low effect size for the correlation between social class and Cantonese-speaking density in the suburb. The relatively flat line further underscores the limited correlation between social class and this measure.

The results from these two measures align with what was observed in Table 23, which indicates minimal correlations between social network or the proportion of Cantonese in the suburb and any of the sociolinguistic variables.

Figure 63 Plots of correlations between social class and social network, and Cantonese-speaking density in the suburb.



How can we explain the patterns observed in these correlation tests? The previous analysis of *the*+VOWEL in Chapter 4 demonstrated that schwa is favoured by the middle class. Therefore, the association between Cantonese proficiency and schwa can once again be interpreted as indicative of the characteristic of the elevated socio-economic status of Chinese Australians, as noted above. The association between Cantonese proficiency and (THERE'S) can be better understood by recognising that (THERE'S) does not represent an ongoing change, as its average rate of use surpasses 70% across all communities. Additionally, there is no class effect for the Young Adult Anglos, indicating that the association between singular THERE'S and the working class has diminished over time. Therefore, Chinese Australians with higher Cantonese proficiency use the singular THERE'S more frequently due to its ceiling effect, which is not attributable to language transfer effect from Cantonese.

As introduced in Chapter 2, Australians of Hong Kong descent are typically well-qualified and highly educated (Jupp, 2001, p. 221), and census data reveals that second-generation Chinese Australians with a Cantonese heritage often enrol in selective or private schools, receive a robust education, and pursue high-status occupations (Australian Bureau of Statistics, 2016). The high social standing of the Chinese community in Australia has been found to manifest in their speech in prior Sydney Speaks research. They frequently align with middle-class language norms, as evident in their lower rate of use of the vernacular form of (ing) (Travis, Grama, & Purser, 2023, p. 13) and their departure from "broad" realisations of diphthongs (Grama, Travis, & Gonzalez, 2021, p. 309), which are characteristic of working-class speech norms.

The association between EOI and *the*+VOWEL_schwa is then an artefact of the favouring of schwa by middle class Australians. For the other linguistic variables, the newer variants are not preferred by the middle class Australians, and correspondingly, there is no correlation with EOI. Overall, the relationship between EOI and *the*+VOWEL_schwa in Chinese Australian speech appears to be influenced by their social class positioning, with those with stronger ethnic orientation and higher social class favouring the newer variant associated with prestige in the broader speech community.

It should be noted that the patterns illustrated in Table 23 and Figure 59 indicate that EOI has a relatively stronger effect compared to the other measures. Here, EOI is a composite score that includes both social network and Cantonese proficiency among its components, such as self-identification of ethnicity (e.g., Chinese Australians, ABC, Asian Australians), connection with China and Chinese traditions (e.g., frequency of traveling to China, celebrating the Spring Festival), and the relationship to Australian culture (e.g., experiences with discrimination, views on multiculturalism), so its effect may also reflect these other measures, with this combined effect giving rise to a stronger influence.

In summary, this section involved correlation tests to revisit the potential effects of four measures of ethnic background on the variation of linguistic variables studied here. None of these measures show significant correlations with the linguistic variables, suggesting that ethnic identity marking does not play a prominent role in the English spoken by Chinese Australians, aligning with earlier findings in the results of regression models.

However, certain tendencies emerge from the analysis. Notably, there is a correlation of medium strength between EOI and *the*+VOWEL-schwa, and medium correlations between Cantonese proficiency and *the*+VOWEL-schwa and (THERE'S). These findings suggest that the measures of ethnic background are not driving the linguistic variation among the Chinese Australians. Should it pertain to ethnic background, I would anticipate its application across all variables, including the future temporal reference, given the significant differences between Chinese and Anglos in rates of use. However, this is not the case in this context. On the contrary, I have found that ethnic orientation and Cantonese proficiency specifically influence *the*+VOWEL-schwa, as well as the impact of Cantonese proficiency on (THERE'S). To explain these tendencies, I have identified a marginally significant positive correlation between social class and EOI, along with a weaker positive correlation between social class and Cantonese proficiency. There is no correlation between social class and neither social network nor

Cantonese-speaking density in the suburb, these measures also do not correlate with the patterning of any of the linguistic variables.

These correlations indicate, then, that Chinese Australians with a stronger orientation to their Chinese heritage and higher Cantonese proficiency tend to occupy higher positions within the social class spectrum. In a study investigating language shift within the Chinese community in the US, it was revealed that “middle class Chinese Americans are most successful in retaining their native language”, a phenomenon particularly prominent in the second generation (Li, 1982, p. 117). Thus, social class might be the underlying mechanism influencing these patterns. It appears that the Chinese Australians are more influenced by the middle class norms set by the Anglo Australians compared to accentuating their ethnic background markers. This is reflective of the overall elevated socio-economic status within the Chinese community in Australia. Collectively, these findings highlight the importance of contextualising the target ethnic community within its broader social context to better understand the emergence or absence of ethnic differentiation.

Chapter 8 Conclusion

8.1 Revisiting the research questions

I have examined here a set of sociolinguistic variables that exhibit different timing of change and are influenced by a range of linguistic and social factors in Australian English, which are ideal for comparing ethnic groups in relation to changes in the wider context. *the*+VOWEL is a relatively recent change, with the newer variants emerging among Young Adults, while Adults show little variation. Furthermore, the increase in newer variants is led by women, particularly in the case of schwa, which is also favoured by the middle class speakers. On the other hand, the future temporal reference system represents an older change, with apparent time differences indicating that *be going to* is well-established among the Adults. Furthermore, *will* is preferred by the middle class Adult Anglo Australians and middle class men, maintaining the stylistic association between *will* and formality. The change of (THERE'S) is the most advanced, showing no apparent time change in rates of use in the 2010s data. However, it was a change in progress in the 1970s, with the teens leading the increase of the singular form THERE'S (El-Khaissi, 2017). One notable change of its social conditioning is the weakening of its class effect over time. For the Adult Anglos, the working class favours the singular form THERE'S, while the lower middle and middle class speakers use similar rates of it. However, this class effect has diminished over time, as evidenced by the lack of a significant class effect among the young adult Anglo Australians.

Based on the above findings, the main questions that I address in this thesis are what role ethnic minorities play in language variation and change, and what factors impact that. In terms of the role of ethnic minorities, the findings of this study show that the Chinese Australians do not play a consistent role across variables. Previous research in the field has often shown that ethnic minorities lead language change (Cheshire, Kerswill, Fox, & Torgersen, 2011; Gross, Boyd, Leinonen, & Walker, 2016; Horvath, 1985; Meyerhoff, Birchfild, Ballard et al., 2020), but there are also studies that have found they lag behind (Van Meel, Hinskens, & van Hout, 2013, 2014, 2018) or participate in ongoing changes in the wider community (Hoffman, 2010; Wong & Hall-Lew, 2014). Studies that have found ethnic minorities in the lead have proposed various mechanisms such as group second language acquisition, ethnic diversity, and social network ties (Cheshire, Fox, Kerswill, & Torgersen, 2008; Cheshire, Kerswill, Fox, & Torgersen, 2011; cf., Cox, Penney, & Palethorpe, 2023; Labov, 1990; Meyerhoff, Birchfild, Ballard et al., 2020; Wong, 2007). Some studies have taken a dynamic approach to ethnicity (Benor, 2009, 2010), measuring it based on speakers' self-reported scores of their orientation towards their heritage

language, culture, and lifestyles (Hoffman & Walker, 2010). According to this perspective, ethnic identity is measured on a continuous scale, and the strength of ethnic orientation and desire to mark ethnic identity has been found to impact speech patterns (Clothier, 2019; Clothier, Fletcher, & Loakes, 2018; Hoffman & Walker, 2010; Nagy, Chociej, & Hoffman, 2014; Newlin-Łukowicz, 2016). In the context of the Chinese community in Australia, this study reveals that they do not always pattern in the same way with respect to the Anglo majority community – they lead, lag, or participate in language change. This cannot be explained by the timing of the change. Furthermore, comparisons with ICE-HK provide no support for transfer from Cantonese, and nor are there strong correlations with ethnic orientation, and where a correlation does emerge, this seems to be tied to social class. Thus, the differences in the participation in change appear to be tied to the class associations of the specific changes being examined.

RQ1: Are the three variables under consideration (the+VOWEL, future temporal reference, and (THERE'S)) currently undergoing change in Australian English, and what is the timing of those changes?

The three variables under investigation show differences in terms of timing of change. *the*+VOWEL is the most recent change, primarily driven by Young Adult Anglo Australians; future temporal reference is an established yet ongoing change; and (THERE'S) appears to be a change that is no longer ongoing in Australian English. For the Chinese, their rates of use of these variables show differences from those of the Anglo Australians – they lead in the use of the schwa and glottalised FLEECE variants of *the*+VOWEL but lag behind in the case of future temporal reference, while their usage is similar for (THERE'S).

RQ2: What are the similarities and differences between Chinese and Anglo Australians in taking up the change?

I have compared the Chinese and Anglo Australians in terms of not only rates of use, but also linguistic and social conditioning.

In terms of rates of use, it has been found that Chinese Australians parallel their Anglo peers for (THERE'S), which is the most advanced of the three variables, but not for *the*+VOWEL and future temporal reference, which show more evidence of ongoing change. Specifically, for *the*+VOWEL, the Chinese Australians use higher rates of newer variants, particularly schwa, while for future temporal reference, they use a lower rate of the newer variant *be going to*

compared to their Anglo peers. These findings suggest that Chinese Australians differ from their Anglo peers in rates of use of ongoing changes, particularly in the case of future temporal reference, as ethnicity is identified as a main effect in the regression model, and for schwa in interaction with social class.

Regarding the linguistic conditioning of these variables, there was no significant interaction between age and any linguistic predictor, suggesting that the conditioning is stable over time. More importantly, there was no significant interaction between ethnicity and any linguistic predictor, indicating that the linguistic conditioning is shared by the Chinese Australians and Anglo Australians, and a shared variable grammar between Chinese and Anglo Australians.

In terms of social conditioning, there are notable class differences between the Anglo and Chinese Australians. Within the Chinese community, there is no significant class effect for any of these three variables, likely due to the compressed socio-economic stratification within this group for which there are no working class speakers. However, there is some class differentiation for the Anglo Australians. Specifically, for *the*+VOWEL, a significant difference is observed between the middle class and lower-middle class among Young Adult Anglos, with the middle class favouring schwa. However, no class effect is found for Chinese Australians in this variable, and both class groups of Chinese Australians similarly to the Anglo Middle Class. There is no class effect for glottalised FLEECE in either the Anglo or Chinese groups. For future temporal reference, the middle class Adults and middle class men disfavour *be going to* among Anglo Australians, while no class effect is found for the Chinese in this variable, and they again orient to the more middle class (and in this case, more formal) variant. In the case of (THERE'S), the working class Adult Anglo Australians display a higher rate of THERE'S, but the class effect has diminished over time, as there are no statistically significant differences between the working class, lower middle class, and middle class Young Adult Anglo Australians. Here, there appears to be no orientation to the middle class form of the previous generation (unlike for the future), which I attribute to the advanced nature of this change. Regarding gender, its effects of *the*+VOWEL and (THERE'S) are shared between the Chinese Australians and the Anglo Australians. Specifically, in *the*+VOWEL variable, both Chinese and Anglo Australian women show a preference for the newer variants, glottalised FLEECE and schwa, over men. In the case of (THERE'S), no gender effect is found for any Australian group. However, for future temporal reference, the gender effect shows some differences in the English of Anglo Australians and that of Chinese Australians. For the Anglo Australians, gender is in interaction with social class, with middle class men disfavouring *be going to*. In contrast,

for the Chinese Australians, gender has no effect, with both women and men disfavouring *be going to*. I interpret this as being a result of the association between *will* and formality.

In summary, the Chinese Australians exhibit both similarities and differences compared to the Anglo Australians in the variation and change of these linguistic variables. The Chinese Australians display a higher rate of newer variants of *the*+VOWEL, particularly schwa, but a lower rate of the newer variant of the future temporal reference, *be going to,* in contrast to their Anglo peers, and for the most advanced change of (THERE'S), they align with their Anglo peers in using a similarly high rate of the singular form THERE'S. These findings highlight the distinct roles that the Chinese Australians play in the variation and change of Australian English. These differences do not correspond to differences in the variable grammar since the linguistic conditioning of all the variables is shared between Chinese and Anglo Australians. Instead, it is the social conditioning that reveals some disparities between the two groups, most notably that of social class.

RQ3: How would substrate transfer from Cantonese be manifest, and is there any evidence of this in the speech patterning of Chinese Australians?

Some studies investigating ethnic variation have indicated that substrate transfer is among the mechanisms accounting for the observed differences between ethnic minorities and the majority communities (Auer & Siegel, 2021; Cheshire, Fox, Kerswill, & Torgersen, 2008; Gnevsheva, 2020). Hence, one of the factors that could impact the English of Chinese Australians is language transfer from their heritage language, Cantonese. Here, I have examined conditioning in the ICE-HK corpus, which provides an indication of how contact from Cantonese may manifest, as the speakers in ICE-HK are first-language Cantonese speakers who are bilingual in English and Cantonese. Where there are differences from their Anglo Australian peers, if the Chinese Australians pattern similarly to the speakers in ICE-HK, then this would provide evidence for transfer from Cantonese, or also possibly from Hong Kong English itself.

For *the*+VOWEL, as I do not have the audio files of the ICE-HK, I cannot test for potential transfer effects. However, for both schwa and glottalised FLEECE, there were no interactions between ethnicity and any of the linguistic predictors, indicating a shared variable grammar for this variable. Thus, language transfer from either Cantonese or exposure to Hong Kong English is unlikely at work in *the*+VOWEL in the English of the Chinese Australians.

Future temporal reference is expressed by auxiliary verbs in English, but by the variable use of adverbs and the auxiliary *wúih* 'will/would' in Cantonese (Matthews & Yip, 2011, p. 217). This typological difference means that we might expect transfer effects to emerge; furthermore, the Chinese Australians do differ from their Anglo peers with a lower rate of *be going to* (and a higher rate of *will*), and this difference emerges as significant in the regression model. However, the investigation of the variation in the future temporal reference system in Hong Kong English showed first, that the Chinese Australians use *be going to* at a much higher rate than the speakers of Hong Kong English (33% vs. 16%), and second, that they share the linguistic conditioning with the Anglo Australians, and differ from the speakers in ICE-HK. Specifically, among all the Australians, there is a favouring of *be going to* in subordinate clauses within positive polarity contexts, in main clauses within negative polarity contexts, and with non-first subjects, and there is no effect for adverb presence, while in ICE-HK, there is no interaction effect between polarity and clause type, nor is there a main effect of subject type, and there was a significant effect for adverbs, wherein non-specific adverbs favour *will*, which could be related to the use of the auxiliary *wúih* 'will/would' in Cantonese. Though direct testing in Cantonese would be necessary to establish this relationship, this distinct linguistic conditioning between Australian English and Hong Kong English provides evidence that language transfer does not account for the variation observed for the Chinese Australians.

Regarding (THERE'S), there are also notable differences between Hong Kong English and Australian English in both rates of use and linguistic conditioning. In Hong Kong English, the rate of the singular form THERE'S is only 24%, much lower than the rate in the English of Chinese Australians, which stands at 73%. However, the rate of THERE'S among Chinese Australians is similar to that of their Anglo peers, at 69%. This discrepancy highlights a prominent difference in the rates of THERE'S between Australian English and Hong Kong English. Analysing linguistic conditioning, it becomes evident that the presence or absence of an extension has a significant effect in Hong Kong English, where the absence of an extension favours the use of THERE'S. In contrast, Australian English does not exhibit a similar extension effect for this variable. Additionally, the effect of determiner type shows some differences between the two varieties. In Australian English, definite/number determiners favour THERE'S, while there is no discernible effect of determiner type in Hong Kong English. These findings indicate distinct grammatical constraints for this variable between the two varieties, with the Chinese Australians again aligning with their Anglo peers.

In summary, the comparisons between Australian English and Hong Kong English in terms of usage rates and linguistic conditioning reveal differences in the patterns of variation for future

temporal reference and (THERE'S), which we hypothesise are due to substrate transfer from Cantonese. These same patterns do not emerge in the speech of the Chinese Australians. These distinctions in linguistic conditioning suggest that there are no substrate transfer effects from Cantonese or Hong Kong English in the English of Chinese Australians. Instead, the observed patterns in the English of Chinese Australians align more closely with those of their Anglo peers, indicating that their English language use is primarily shaped by the sociolinguistic context of Australia, rather than being influenced by language transfer effects from Cantonese or Hong Kong English.

RQ4: Do Chinese Australians with different degrees of orientation towards their ethnic heritage pattern differently in adopting these changes?

To test the ethnic orientation of the Chinese, I explored four measures: Ethnic Orientation Index, social network, self-reported Cantonese proficiency, and Cantonese-speaking density in the suburb. The examination of the four measures, conducted through regression models in each analysis chapter and correlation tests in Chapter 7, revealed that none of these measures exhibited significant effects. This collective result suggests a limited overall impact of ethnic orientation on the three variables explored in this thesis.

There were, however, some medium (non-significant) correlations, between Ethnic Orientation and *the*+VOWEL-schwa and Cantonese proficiency and *the*+VOWEL-schwa and Cantonese proficiency and (THERE'S). The effects indicate a positive correlation in each case, such that Chinese Australians with a stronger orientation towards their Chinese heritage are more likely to use the newer variant, schwa, and those with greater Cantonese proficiency are more likely to use schwa, as well as the singular form THERE'S. These results are surprising because we did not observe a significant main effect of ethnicity in the regression model for these two variables but did for future temporal reference. The results from the correlation tests do not seem to support this. Instead, the most advanced change among the variables (variable (THERE'S)), which has similar usage rates between Chinese Australians and both age groups of Anglo Australians, surprisingly exhibits a medium-effect size correlation with self-reported Cantonese proficiency.

These were further tested with the correlation tests and here, a marginally significant correlation between social class and EOI emerged. This suggests that Chinese Australians displaying a stronger affinity for Chinese culture and lifestyle are more likely to occupy higher positions within the social class hierarchy. Moreover, considering self-reported Cantonese

proficiency as one component of EOI, which did not exhibit statistical significance with each other as previously demonstrated in Chapter 3, this outcome further indicates that Chinese Australians with greater proficiency in Cantonese—thus more aligned with Chinese culture—are also more inclined to occupy higher social class positions.

How do these compare with Chinese immigrants in other parts of the world? A role for EO has been proposed as an explanation of ethnic variation among Chinese communities in work in North America. For example, in Canada, concerning their participation in the Canadian Vowel Shift, Chinese Canadians with higher EO tend to adhere more to traditional norms, whereas those with lower EO are more inclined to embrace newer norms (Hoffman & Walker, 2010, p. 56). Another study conducted among Chinese Americans in New York City (NYC) found that the adoption of features typical of NYC English by Chinese Americans decreased as their level of EO increased (Wong, 2007, p. 227). This implies that the stronger the identification with their Chinese heritage among the Chinese in North America, the less likely they are to adopt local linguistic features. These studies, however, do not consider the social meaning of the variation among the majority population. Other studies have considered the social meaning, finding that Chinese Americans raised in different regions of the United States assimilate more to the linguistic patterns of their respective regions than to each other, suggesting that ethnicity may not be the driving factor here. For instance, the raised BOUGHT vowel, associated with a "typical New Yorker" persona and associated with working-class European ethnicities, was found to be avoided by Chinese New Yorkers, but not by Chinese San Franciscans where this same association was not relevant (Wong & Hall-Lew, 2014, pp. 39-40). This indicates, then, social meaning of variables in the wider community can impact patterns of ethnic variation, which aligns with the finding in the thesis of a role for social class, and highlights this as something that warrants further attention.

RQ5: How can the similarities and differences in the speech patterning between Chinese Australians and Anglo Australians be accounted for?

Several factors potentially account for the similarities and differences in speech patterns between Chinese Australians and Anglo Australians. Specifically, as summarised in Section RQ3 above, I have tested for language transfer by comparing, for the two morphosyntactic variables, the conditioning in Australian English and Hong Kong English. This revealed different linguistic constraints in operation. The Australian Chinese, however, subscribe to the variation patterns in Australia, not those in Hong Kong. As summarised in Section RQ4, I have also tested for effects related to ethnic background by performing correlation tests with four

measures, including the ethnic orientation index, social network, proportion of Cantonese-speaking Australians in the suburb, and self-reported Cantonese proficiency. Effects were at best medium, and did not reach significance. Thus, there is little evidence that ethnic identity marking is at work in the English of Chinese Australians.

The most revealing explanation for the observed differences is the social conditioning of these variables. In particular, I have noted that the Cantonese-background Chinese community in Australia tends to be of high socioeconomic standing, and this has been found to have an impact in speech. Previous work conducted by the Sydney Speaks team on other linguistic variables such as word-final *-er* (Grama, Travis, & Gonzalez, 2020), diphthongs (Grama, Travis, & Gonzalez, 2021), *ing* (Travis, Grama, & Purser, 2023), and pre-nasal TRAP (Sheard & Qiao, 2021), has demonstrated that, for variables that are socially stratified, the Chinese Australians tend to pattern similarly to middle class Anglo Australians, apparently orienting to forms associated with overt prestige. This means that, the appropriate benchmark against which to compare with Chinese Australians may not be all Anglo Australians, but rather Australians of higher socioeconomic classes.

For *the*+VOWEL, I identified a favouring effect by women for both of the incoming variants, glottalised FLEECE and schwa, and for schwa, also a favouring by the middle class for Young Adult Australians. How do the Chinese Australians react to this change and the related social conditioning? The analysis reveals that for glottalised FLEECE, there were no effects of class and ethnicity for the Young Adult Anglo and Chinese Australians. However, for schwa, there was a significant interaction between ethnicity and class. The prominent class stratification observed among the Young Adult Anglo speakers, where the middle class shows a higher rate of schwa than the lower middle class, was not present among Chinese Australians. Instead, both the lower middle class and middle class Chinese Australians were found to resemble their middle class Anglo peers. They also resemble their Anglo peers with women favouring schwa over men. Thus, the fact that the Chinese Australians have a higher rate of schwa than the Anglos overall is consistent with their middle class orientation, adopting the form used by middle class Anglo Australians, and women.

For future temporal reference, there are interactions between age and class, and between gender and class, with the older variant, *will*, being favoured by middle class Adult Anglos and middle class men. Thus, it is middle class Adult Anglos, middle class men, and Chinese Australians who most lag in this change. Thus, once again, the Chinese Australians align more closely with the middle class, but in this case, only as this applies to the previous generation

and to men. Here, I interpret this as being due to the stylistic association between *will* and formality, which may appeal to the Chinese orientation to norms of overt prestige, if we assume that these align with formality.

And finally, for (THERE'S), there is a class effect only for the Adult Anglo Australians, whereby the working class most favours the singular form THERE'S. For the Young Adult Anglo Australians, there is no longer any class effect, suggesting a diminished class effect for this variable over time, and for neither age group is there a significant effect for gender. In this case, the Chinese Australians align with their Anglo counterparts, and, similar to their Anglo peers, there is no gender effect. For this variable, unlike for future temporal reference, the Chinese are not sensitive to class differences of the previous generation. I propose that this difference is due to the fact that the change for (THERE'S) is further progressed (note that, for the Young Adult Anglos, the rate for THERE'S vs. THERE ARE is 69%, much higher than that of *be going to* vs. *will,* at 49%). These patterns suggest that once the class effect has faded over time and THERE'S has become the majority variant, the Chinese Australians pattern themselves after their Anglo peers.

Additionally, correlation tests revealed that Chinese Australians who have a stronger orientation to their Chinese heritage and a greater command of Cantonese are more likely to be at the higher position of the class spectrum. Combined with the findings regarding the effects of gender and social class, these results suggest that the variation in the roles of Chinese Australians in language change cannot be solely attributed to ethnicity but instead largely arise from the interplay between ethnicity and class.

In summary, for the Chinese Australians, the general finding is that the lower middle and middle class speakers exhibit similar patterns, and resemble middle class Anglos across the variables. In terms of gender distinction, both Chinese men and women resemble Anglo women, and favour the standard or prestige variants for these variables. Overall, then, the Chinese Australians seem to be more homogeneous in both gender and social class, with an overall orientation to more overtly prestigious variants. As noted, this patterning is consistent with what has been found in previous Sydney Speaks work, as studies consistently reveal that the Chinese Australians tend to align with the middle class norms set by Anglo Australians (e.g., Grama, Travis, & Gonzalez, 2020; Grama, Travis, & Gonzalez, 2021; Sheard & Qiao, 2021; Travis, Grama, & Purser, 2023). Thus, studies on ethnic variation should consider the interaction between ethnicity and other social factors, as well as the variation and change

occurring within the majority community, to gain a better understanding and interpretation of the speech patterns of ethnic minorities.

8.2 Future directions

First, this study has examined three variables that reflect the variation and change of English among Chinese Australians, focusing on morpho-syntactic (future temporal reference, (THERE'S)) and morpho-phonological (*the*+VOWEL) levels. For *the*+VOWEL and (THERE'S), there are no systematic differences between the communities, once we take the effects of class into consideration. In terms of future temporal reference, Chinese speakers lag behind their Anglo peers in the increase of *be going to* and instead resemble the previous generation, favouring *will*. This is surprising, considering the proposal of Cheshire (2005, p. 479) that the social dimension of variation differs fundamentally between phonological and syntactic forms, with the latter often not being available for social work. Phonological variants allow speakers to signal their affiliation with various social groups due to the arbitrary form-meaning relationship, while syntactic forms, integral to discourse and the expression of propositional and attitudinal meanings, often exhibit a more complex social embedding. Here, only one morphosyntactic variable, future temporal reference, lends itself to marking ethnic differences. Furthermore, a range of sociophonetic variables have also revealed little in the way of ethnic differences, once the effect of class is taken into account (see also Grama, Travis, & Gonzalez, 2020; Grama, Travis, & Gonzalez, 2021; Sheard & Qiao, 2021; Travis, Grama, & Purser, 2023). Nevertheless, ethnic differences may emerge with other variables, and Grama, Travis and Gonzalez (2021, p. 309) suggest that investigating consonantal realisations, voice onset time, and prosody would be valuable avenues for future research.

Second, I have focused on the Cantonese background Chinese community in Sydney, but we cannot assume from this that the same results would apply to other Chinese communities in Australia. As discussed in Chapter 2, Mandarin background and Cantonese background Chinese in Australia have different migration timelines, social standings, and reasons for migration. Cantonese background Chinese primarily migrated to Australia under a business migration scheme dating back to the 1980s, bringing with them a high socioeconomic status and good English skills (Clyne, 2003, p. 14). Consequently, their children have formed a predominantly middle class community with favourable living conditions, education, and occupations (Markus, Jupp, & McDonald, 2009, p. 79). On the other hand, the Mandarin background Chinese community is more recent but rapidly growing in Australia and exhibits a wider range of class distribution (Zhang, 2015, p. 2) (see Jupp, 2001 for more details). Work

done in North America comparing Mandarin background Americans and Cantonese background Americans has found significant differences in vowel realisations (Cheng, Faytak, & Cychosz, 2016). It would be worthwhile exploring whether similar distinctions exist within the Chinese communities in Australia in their speech patterning. Additionally, the social network of second-generation Cantonese Australians in this sample indicates their interactions with numerous other Asian communities, in particular Singaporeans and Malaysians. Thus, investigating additional Asian Australian populations like these (but also others, such as Vietnamese and Korean Australians), who possess more recent migration histories and a broader range of social classes, could yield valuable insights. By comparing diverse Asian communities characterised by varying migration timelines and social stratification, we could delve into whether a pan-Asian identity holds more significance for Chinese Australians than a solely ethnic Chinese identity and the reasons behind that.

Third, as the study has found that the second-generation Cantonese background Chinese Australians have formed a middle-class-oriented community, and recent census data indicates an increasing population of other ethnic communities such as Lebanese and Indian communities (Australian Bureau of Statistics, 2021), with a wider range of class spectrum, it would be worth looking at different migrant groups to examine whether class differences also play a role for them.

Another avenue for future research is to explore the English of first-generation Cantonese background Chinese Australians. This would allow for a direct intergenerational comparison of ethnic orientation within this Chinese community. While I used Hong Kong English as a proxy for the speech of Cantonese-English bilinguals, it is important to acknowledge that the English spoken by the first-generation Cantonese background Chinese Australians (which the second-generation speakers here would be exposed to) may differ from that of individuals from Hong Kong due to their unique experiences living in Australia and the societal differences between Hong Kong and Australia. Additionally, none of ethnic orientation index, social network, heritage language spoken in suburb, or heritage language proficiency significantly correlate with the patterning of the variables investigated in this thesis. Thus, one of the next steps would involve examining the intergenerational differences of the effects of social network, ethnic orientation, and heritage language proficiency to examine their changes over time.

Additionally, the longevity of ethnolectal features may be affected by the ongoing social context that may impact the linguistic patterns of ethnic minorities. For example, real-time studies on word-final *-er* conducted by the Sydney Speaks team among Italian and Greek Australians

have found that teenagers from these communities produced longer *-er* than adult and teenage Anglos in the 1970s. However, the lengthening of *-er* has become a community-wide phenomenon today, indicating incremental progress in this variable and loss of its ethnolectal status over time (Grama, Travis, & Gonzalez, 2020, pp. 358-359; Sheard, 2022, p. 54). Similarly, there is little evidence supporting the longevity of ethnic differentiation in the variation and change of diphthongs among ethnic groups in Australia. In the 1970s, teenage Italian and Greek Australians led diphthong changes towards more "general" and move away from "broad" (working class norms) and "cultivated" (middle class norms), but shared diphthong realisations have emerged among Anglo, Italian, and Chinese Australians today (Grama, Travis, & Gonzalez, 2021, p. 309). Thus, conducting a real-time study for the Chinese community twenty or thirty years later would enable an assessment of changes in their social standing and the influence of societal change on their speech patterns.

Finally, the intersection of ethnicity and social class emerges as the most compelling factor explaining the identified patterns in this thesis. While there is widespread recognition of such an intersection, too often, ethnic patterning is examined independently of social class, meaning that patterns of ethnic variation may be missed. Hence, there is a pressing need for further research in this area to assess the extent to which this theoretical argument can be applied elsewhere. Comparative studies across diverse communities and regions would help elucidate the broader implications of these findings and contribute to a more comprehensive understanding of the complex interplay between ethnicity and social class.

8.3 Contributions of this thesis

In closing, I would like to summarise some of the main contributions of this thesis.

First, this thesis distinguishes itself through large-scale analysis of variation and change in the speech of the Australian Chinese community, a community that has received limited scholarly attention, and contextualising that in relation to an Anglo benchmark. The Sydney Speaks corpus has provided large amounts of data from men and women of different ages and different class groups, allowing for me to track the way these changes are taken up socially over time. This comparative analysis allows for a better contextualisation of ethnic minorities within the wider community and facilitates an examination of their role in language change in relation to societal shifts and social standing.

Second, this thesis explored a new set of variables at both the sociophonetic and morphosyntactic levels, differing from previous studies conducted under the Sydney Speaks project (e.g., Grama, Travis, & Gonzalez, 2020; Grama, Travis, & Gonzalez, 2021; Sheard & Qiao, 2021; Travis, Grama, & Purser, 2023; Travis & Torres Cacoullos, 2023). Collectively, these findings reveal that the Chinese Australians exhibit a consistent patterning that is similar to the middle class Anglo Australians. Here, this has been seen with the higher rate of use of the newer variant of *the*+VOWEL, schwa, which aligns with the patterning of middle class Anglo Australians; a favouring of the formal variant of the future temporal reference, *will*; while they parallel their Anglo peers in the rates of use of THERE'S, for which the association with the working class has diminished for their Anglo peers.

Third, this thesis has brought in a second benchmark, English spoken in Hong Kong, with the ICE-HK corpus, allowing me to identify where we might see language transfer effects. The findings highlight different linguistic conditioning in Hong Kong English as opposed to Australian English, with Chinese Australians patterning like their Anglo counterparts. There is no evidence, then, for a role for transfer effects in shaping the language variation observed among Chinese Australians' English usage.

And finally, the Sydney Speaks project collected extensive social information from speakers. This includes age, gender, ethnicity, social network, Cantonese proficiency, and ethnic orientation, both from the demographic questionnaire and the interviews themselves. This allowed an EO index to be developed, but also a robust measure of social class, taking into account factors such as occupation, education level, school type, and suburb. It indicates that second-generation Cantonese background Australians belong to a predominantly middle class community. This assertion finds support in various sources, including the Census data (Australian Bureau of Statistics, 2016, 2021), existing literature (Jupp, 2001; Markus, Jupp, & McDonald, 2009), and fieldwork conducted by the Sydney Speaks team (Travis, 2014-2022), which indicate that the second generation Cantonese background Chinese community in Australia tend to attend selective schools, reside in affluent suburbs, attain high levels of education, and pursue professional careers with high incomes. The analysis also demonstrates the relevance of the characteristics of the Chinese community in Australia to the linguistic patterns observed. There is a robust effect of middle class orientation, indicating that second-generation Cantonese background Chinese Australians are generally situated in a middle class social context in Australia. This finding aligns with other research conducted by the Sydney Speaks team (Grama, Travis, & Gonzalez, 2020, 2021; Lee, 2020; Qiao & Travis, 2022; Sheard & Qiao, 2021; Travis, Grama, & Purser, 2023).

While this wealth of information is often overlooked in studies examining ethnic differences, it holds significant importance in interpreting such differences when they arise. As Travis, Grama and Purser (2023, p. 31) aptly argue, “it should be no surprise that ethnicity intersects with other social factors. Just as age, gender and social class are not independent components of social background, nor can ethnicity be considered in isolation”.

This thesis contributes significantly to theory by delving into the intricate intersection of ethnicity with other social variables. It seeks to enhance our understanding of ethnicity beyond merely exploring ethnic differences. Instead, it situates ethnicity within a broader context, aiming to understand the role of ethnic minorities in language change while also considering the influence of other social characteristics that affect ethnicity. Community members themselves are also aware of the intricate social context of language use. For instance, during an interview, Lathan, a male Chinese Australian, referred to the interplay between ethnicity and other social factors such as socioeconomic status and geography, in relation to accent in Australian English.

(77) Quote from Lathan, a Chinese Australian man:

Lathan:	*.. It's --*
	it could b[e ..] drawn --
Brett	*[Hm].*
Lathan	*...(1.0) i- it's --*
	it's kind of like a --
	.. what do you call those.
	like a plane graph.
Brett	*.. Hm hm h[m].*
Lathan	*[S]o I think,*
	... you know,
	.. ethnicity could be the X- axis or whate[ver.
Brett	*[Yeah].*
Lathan	*and] then,*
	you know,
	.. socioeconomi[c factors or,
Brett	*[Oh=].*
Lathan	*like,*
	ge]ography or whatever is the Y.
Brett	*.. (TSK)*
Lathan	*.. axis.*
	And then you've got a Z- [axis.
Brett	*[Hm.*
Lathan	*and all that kind of stu]ff.*

[SydS_CYM_072_Lathan]

Thus, the intersection of ethnicity and other social factors is fundamental in studies of language variation and change. This dynamic is clearly manifest in both the speech data and the community's awareness, opening new avenues that demand heightened scholarly scrutiny in future research within this domain.

Appendix 1: Interview topics in *Sydney Speaks*

Sample topics of interest

Not an exhaustive or restrictive list, but a sample of the kinds of topics we are interested in.

- **Sociodemographic information**
  - Where they grew up, suburbs they have lived in
  - Where they went to school/school type (e.g. public, private, religious), level they completed, what they studied, what their school was like
  - Current, past jobs and what they do / did in those jobs; future aspirations (for younger speakers)
  - Places they have travelled to; hobbies, general interests
  - If of a migrant background: when and why their parents came to Australia; how their parents adapted; how they felt growing up in Australia
- **Family and friends**
  - Where parents are from / grew up
  - Parents' education, (current / past) employment
  - Activities they do as a family (Christmas, Easter, Chinese New Year, etc.)
  - Where their friends are from (Sydney, all over Australia, specific ethnic groups)
  - If of a migrant background: how large their family network is in Sydney / in Australia; what relatives they have in their parents' home country; ties they have with those relatives
- **Language** (most relevant for those of a migrant background)
  - Languages they speak
  - Where they learned the language(s)
  - Who they speak it with (e.g., parents, grandparents, siblings, children, friends, workmates) and where they speak it (e.g., home, at church, with co-workers)
  - How often and how well they speak the language(s)
  - Whether they can read and write in the language(s)
  - Whether they like to listen to music, watch TV in the language(s)
  - Exposure to that language: was the language spoken at home when they were growing up? did they go to a community school? did / do they make trips back to that country? did / do they participate in community events in Australia?
- **Diversity**
  - Diversity in the area where they live / work / study
  - Whether they think Australia is a multicultural country, what they think about that, whether / how Australia values diversity, how diversity is dealt with politically
  - What they perceive as being stereotypically "Australian", and, for those of migrant background, what they think is more associated with that migrant community
  - What they think about migrants speaking their community languages, Anglo-Australians learning those languages
- **Identity**
  - How they identify themselves – "Australian" (what term do they use?), or tied to an ethnic background (NB: better if not asked as a direct question)
  - Terms used to identify people of different social groups, who uses those terms and what they mean (e.g., *Westie, Bogan, Hipster, Aussie, Anglo, ABC*, etc.)
  - Whether / how the way they identify themselves has changed over time
- **Australian English**
  - Whether they think Australian English is spoken differently by different people (from different parts of Australia, of Sydney, in different professions, etc.)
  - What it is that is different (different words, pronunciation, grammar)
  - Is there any variety / aspect of a variety that sounds better / worse than another?

Appendix 2: Demographic questionnaire in *Sydney Speaks*

ARC CENTRE OF EXCELLENCE FOR THE DYNAMICS OF LANGUAGE

Office use only:

REC FILE NAME:

_____

Community RA – TO FILL:

PARTICIPANT A PSEUDONYM: _____

PARTICIPANT B PSEUDONYM: _____

SYDNEY SPEAKS: LANGUAGE VARIATION AND CHANGE IN A DIVERSE SOCIETY

Demographic Information Sheet- Migrant community

Community RA pseudonym	
RA Interview Number	
Date and time of recording	
Place of recording (suburb + venue)	
Duration of recording	
Recording conducted with ZOOM plugged into power source or on battery life?	

(The following is to be filled in by the Community RA while the recording is still on.)

	PARTICIPANT A	PARTICIPANT B
Participant Code		
Gender		
Year of birth		
Place living when born (suburb, state/territory)		
Current place (suburb name) of residence, how long		
Other Sydney suburbs lived in (for 2 yrs or over), how long		
If born outside Australia, year & age of arrival to Australia		
Number of years lived outside Syd: Where, how long in each place		
Who the speaker lives with (list all)		
Occupation (if student, list level; if retired / unemployed, list previous; if several, can list more than one)		
Level of education completed		
Name of high school attended		
Language other than Eng. spoken		

ARC CENTRE OF EXCELLENCE FOR THE DYNAMICS OF LANGUAGE

Office use only:

REC FILE NAME:

_____

Community RA – TO FILL:

PARTICIPANT A PSEUDONYM: _____

PARTICIPANT B PSEUDONYM: _____

Raised in an Australian-English speaking household (Y/N)		
Where was the speaker's mother born / raised		
Mother's language (other than Eng.)		
Where was the speaker's father born / raised		
Father's language (other than Eng.)		
Self-rating of community language speaking ability (not inc. English) (1 = poor to 5 = native-like)		

Network: Participant's partner and closest friends (Add extra rows if necessary – no specific limit.)

PARTICIPANT A

	First Name	Gender	Where you know them from	Where they live	Ethnic group *(NB: 'Australian' understood as Anglo Australian)*
1.					
2.					
3.					
4.					
5.					
6.					

PARTICIPANT B

	First Name	Gender	Where you know them from	Where they live	Ethnic group *(NB: 'Australian' understood as Anglo Australian)*
1.					
2.					
3.					
4.					
5.					
6.					

Appendix 3: Transcription conventions in *Sydney Speaks*

(Du Bois, Schuetze-Coburn, Cumming, & Paolino, 1993)

Carriage return	new Intonation Unit
.	final intonation contour
,	continuing intonation contour
--	truncated intonation contour
-	truncated word
=	lengthened syllable
?	appeal intonation contour
..	short pause (0.5 secs)
…	medium pause (0.5–0.7 secs)
…( )	timed pause (0.8 secs or longer)
[ ]	overlapped speech
~	pseudonym within the text (all speaker names are pseudonyms)
X	one syllable of unclear speech
<X X>	unclear speech (transcriber's best guess)
@	one syllable of laughter
<@ @>	speech uttered while laughing

Appendix 4: Transcription conventions in ICE-HK

(Nelson, 2002)

<$A>, <$B>, *etc*	speaker identification
<I>...</I>	subtext marker
<#>	text unit marker
<O>...</O>	untranscribed text
<?>...<?>	uncertain transcription
<->...</->	normative deletion
<+>...</+>	normative insertion
<=>...</=>	original normalization
<.>...</.>	incomplete word
<}>...</}>	normative replacement
<[>...</[>	overlapping string
<{>...</{>	overlapping string set
<,>	short pause
<,,>	long pause
<(>...</(>	discontinuous word
<)>...</)>	normalised disc. word
<X>...</X>	extra-corpus text
<&>...</&>	editorial comment
<@>...</@>	changed name or word
<w>...</w>	orthographic word
<quote>...</quote>	quotation
<mention>...</mention>	mention
<foreign>...</foreign>	foreign word(s)
<indig>...</indig>	indigenous word(s)
<unclear>...</unclear>	unclear word(s)

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