Phonological Variation of Consonants by Hong Kong Cantonese Speakers of English: A Sociolinguistic Perspective

LEUNG, Ming Ming Grace

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Thesis/ Assessment Committee

Professor Gwendolyn Gong (Chair)

Professor Jette Hansen Edwards (Supervisor)

Professor Danny Leung (Committee Member)

Professor Tony Hung (External Examiner)

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ABSTRACT

The current study aims to investigate 15 English consonants produced by Cantonese speakers of English from a sociolinguistic perspective because there is a lack of sociolinguistic research about the English pronunciation of Cantonese speakers in Hong Kong. This study investigates the effect of extralinguistic, including gender, age, social class, speech style, and frequency of oral English language use, and linguistic factors, consisting of linguistic environment and syllable/word position, on three types of English production, including accurate production, feature change, and deletion, of Cantonese speakers in Hong Kong.

The present study focuses on 15 English consonants, seven singleton consonants, /f, v, θ, ð, r, n, l/ and eight consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/, produced by Cantonese speakers of English. A total of 47 participants, 23 men and 24 women, were invited to participate in the study, and they were divided into three age groups, including 20-30, 31-45, and 46-60. Data were collected from a word list, two reading passages, answer to a passage, and an interview.

Among the demographic factors, only social class was found to be significant for accurate production, feature change, and deletion while gender and age were not significant for all types of production. The interrelationship of social class with family background, educational background, and oral English use of Cantonese speakers was shown to be crucial for better English pronunciation due to more exposure to oral English use. It is supported by the findings of the significant effect of frequency of oral English language use on accurate production and feature change because frequent use of oral English led to more accurate production and less feature change of the English consonants. Finally, linguistic environment and syllable/word

position were significant factors for all types of production and their effect was relatively stronger than other significant factors. The results show that the participants encountered more difficulties in pronouncing the English consonants /v/, /θ/, /ð/, /r/ which do not appear in the Cantonese language inventory. Although participants were able to articulate correctly in onset position, they had a strong tendency to delete /l/ syllable-finally. Deletion of /r/ or /l/ in the consonant clusters generally happened more frequently in /pl/, /pr/, /kr/, and /gl/ with a following back vowel or diphthong. Furthermore, the Markedness Differential Hypothesis (Eckman, 1977) helps explain the reasons for the higher accuracy of the English consonants in the syllable-initial and word-initial position which is less marked and less difficult compared with the more marked syllable-final position.

The current study may contribute to the area of linguistic variation in Hong Kong and it may help language teachers and practitioners to understand the reasons for learners' English pronunciation so that they may assist the learners more effectively with tailor-made teaching for a particular group of learners. The present research will hopefully shed light on the phonology of English by Cantonese speakers since the findings of this study will possibly lead to a future discussion of the English pronunciation of Cantonese speakers of English in Hong Kong.

論文摘要

鑒於從社會語言學角度調查香港廣東話母語者的研究甚少，本論文以社會語言學視角研究了廣東話母語者所發音的 15 個輔音。本研究在英語發音的三個層面上（包括準確發音，特色改變，和發音刪除）調查了香港廣東話母語者的非語言因素（包括性別，年齡，社會階層，言語風格，英語使用頻率）和語言因素（包括語言環境和音節/單詞位置）的影響。

本研究集中研究了廣東話母語者的 15 個英語輔音，包括 7 個單個輔音/f, v, θ, ð, r, n, l/ 和 8 個雙輔音/pl, pr, bl, br, kl, kr, gl, gr/。受試者包括 23 男 24 女共 47 人，并被細分為 20-30， 31-45， 45-60 三個年齡組。實驗數據收集自單詞表，兩篇閱讀篇章，對篇章的回複，以及對談。

在人口統計學因素方面，只有社會階層對準確發音，特色改變，和發音刪除有顯著影響；而性別和年齡則沒有任何顯著影響。社會階層和家庭背景、教育水平、英語口語運用的交互關係對良好英語發音有關鍵性影響，因為更高的社會階層有更多口語輸入機會。本研究證明發現口語運用的頻率對準確發音和特色改變有顯著影響因為高頻率的口語運用會引致更準確的發音和更少的特色改變。最後，語言環境和音節/單詞位置對所有類型發音都有顯著影響，而且其效果相對其他因素更為強烈。研究結果顯示，受試者在發/v/, /θ/, /ð/, /r/時遇到更多困難，而這些輔音並不存在於廣東話中。受試者對於起始位置的/l/可以準確發音，但是他們常常在省略詞尾的/l/。在發/pl/, /pr/, /kr/, and /gl/時他們也更容易省略/r/和 /l/，特別是其元音為后元音和雙元音的時候。再者，標記差別猜想（Eckman, 1977）也有助於解釋為何在音節起始位置發音會更準確，因為該位置是更少被標記的，因為相對於音節尾被標記的音節會更容易發音。

本研究既可以對香港語言變異研究作出貢獻，也有助於語言教師理解英語學習者的發音問題並藉此幫助設計有效的對應方案以助益特定學生群體。本研究也許可以拋磚引玉帶來更多對於廣東話母語者英語發音討論，並促進廣東話母語者的英語音系學研究。

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Chapter 1

Introduction

1.1 Background to the Study

Sociolinguistic research (Adamson & Regan, 1991; Bayley, 1995; Coates, 2004; Eckert, 1989; Irwin & Nagy, 2007; Labov, 1972; Levy, 2010; Marshall, 2003; Milroy & Milroy, 1978; Mougeon & Rehner, 2001; Purcell & Suter, 1980; Rehner, Mougeon, & Nadasdi, 2003; Suter, 1976; Thompson, 1991; Trudgill, 1972) on linguistic variation has shown that various social or extralinguistic factors, such as gender, age, social class, language use, and speech style, play an important role in language variation and change. Research has generally focused on the investigation of English production of native English speakers and second language (L2) speakers of English, as well as French production of learners of French as a second language (FSL), but there is still a lack of research on linguistic variation in English of the speakers of other languages. Although the English pronunciation of Cantonese speakers has been studied previously (Bolton & Kwok, 1990; Chan, 2006a; Chan, 2006b; Chan, 2007; Chan & Li, 2000; Deterding, Wong, & Kirpatrick, 2008; Hung, 2000; Peng & Setter, 2000; Yam, 2005), these studies mainly emphasized the transfer from Cantonese to the English pronunciation of Cantonese speakers and there is a lack of comprehensive research (Bolton & Kwok, 1990) on the English pronunciation or linguistic variation of Cantonese L2 speakers of English from a sociolinguistic perspective. The present study does not only help explain the role that Cantonese transfer plays in the English pronunciation of Cantonese speakers, it also explains the effect of different extralinguistic and linguistic factors on the English pronunciation of Cantonese speakers.

In the previous research (Bolton & Kwok, 1990; Chan, 2006a; Chan, 2006b; Chan, 2007; Chan & Li, 2000; Deterding, et al., 2008; Hung, 2000; Peng & Setter, 2000; Yam, 2005) about English singleton consonants and consonant clusters produced by Cantonese speakers in Hong Kong, it was found that English consonants which do not appear in Cantonese, for example, /v/, /θ/, /ð/, and /r/, may be more difficult for Cantonese L2 speakers of English. Based on these findings (the details will be provided in Section 2.2), 15 variants, including seven singleton consonants, /f, v, θ, ð, r, n, l/ and eight consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/, were selected so as to find out whether Cantonese speakers may have difficulties in articulating these consonants and the effect of the extralinguistic and linguistic factors on different types of English production of Cantonese L2 speakers of English.

1.2 Purpose and Significance of the Study

Since there is a lack of sociolinguistic research about the English pronunciation of Cantonese L2 speakers of English in Hong Kong, the current study aims to examine the English consonants produced by Cantonese speakers from a sociolinguistic perspective. This study investigates the effect of extralinguistic factors, including gender, age, social class, speech style, and frequency of oral English language use, along with linguistic factors, consisting of linguistic environment and syllable/word position, on the English pronunciation of Cantonese speakers in Hong Kong. A study of linguistic variation from a sociolinguistic perspective can possibly explain the reasons for the English pronunciation or phonological variation of Cantonese L2 speakers of English.

This study may also help L2 teachers and practitioners to understand the reasons for learners' English pronunciation so that they may assist the learners more effectively with tailor-made teaching for a particular group of learners. The present research will hopefully shed light on the English phonology of Cantonese speakers since the findings of this study will possibly lead to a future discussion of the English pronunciation of Cantonese L2 speakers of English in Hong Kong.

1.3 The Status of English in Hong Kong

In Hong Kong, Cantonese is the primary language used in intimate domains, including family and friends, as well as in employment, public life, social activities, the government, civil service, and education (Bolton, 2000). According to the Hong Kong Special Administrative Region Census and Statistics Department [HKCSD] (2007), the results of the 2006 Population By-Census showed that the usual language of 90.8% of the Hong Kong population in 2006 was Cantonese. Based on the definition provided by HKCSD (2006), "the usual language is the language/dialect a person used in daily communication at home". Cantonese is the spoken language of Hongkongers while traditional Chinese characters or Cantonese (Chinese language) is the written language in Hong Kong. As Hong Kong was a British colony from 1842 to 1997, both Cantonese and English are the primary languages used in Hong Kong. During the British colonial period, "the English language had the status of the official language government, the official language of law, and was *de facto* the most widely-used medium of secondary and university education" (Bolton, 2000, p. 270). The English language was extensively used in education, industry, trade, business, finance, as well as communications. Chinese was not recognized as a co-official language in 1974 until the Official Languages Ordinance established that Chinese and English "possess equal status and enjoy equality of use" (Official Languages Ordinance, 1995). Lai (2010) mentioned that Cantonese and English were the major languages spoken in Hong Kong for distinctive functions before the return of sovereignty in 1997. English is regarded as a prestigious language primarily used for the formal purposes in the governmental institutions, legal system, education, and in the realm of international business while Cantonese is the usual language used by the majority of Hong Kong population for informal daily-life purposes. The status of English language is maintained after the return of sovereignty to China in 1997 as the Article 9 in Chapter 1 of Basic Law of the Hong Kong Special Administrative Region (HKSAR) stated that: "In addition to the Chinese language, English may also be used as an official language by the executive authorities, legislature and judiciary of the Hong Kong Special Administrative Region" (HKSAR, 2008).

Bolton (2000) reported that the educational reforms in 1970s and 1980s have made a major contribution to the spread of the knowledge of English. Unfortunately, the government failed to implement Chinese-medium or English-medium of instruction in 1970s because of the opposition from parents and schools to the initial plan to promote Chinese as a teaching medium. As a result, there was a *laissez-free* approach for the schools to decide their medium of teaching and the English-medium system became a continuum instead of a clear boundary of either Chinese-medium or English-medium teaching instruction in the late 1980s and early 1990s. Prestigious secondary schools provide teaching in English-medium but the schools with the lowest rank mainly use Cantonese as the medium of instruction. Yet, the majority of schools lie between these two types of schools since both Cantonese and English, that is "mixed code" (Bolton, 2000, p. 272), are used for teaching. Although the English language has an important status in Hong Kong, it is not the primary language spoken in Hong Kong as English is the usual language used by only 2.8% of the Hong Kong population in 2006 (HKCSD, 2007). A number of researchers have questioned about the use of English, which may be regarded as a foreign language instead of an L2, in Hong Kong. Luke and Richards (1982, as cited in Bolton & Kwok, 1990) suggested that "the status of English is neither a foreign language nor a second language, but something between the two: an 'auxiliary language'" (p. 149). It has been reported that 98% of the Hong Kong population were Cantonese-speaking Chinese (Yu & Atkinson, 1988, as cited in Bolton, 2000). Moreover, 98% of the Hong Kong population spoke Chinese at home and English was regarded as a foreign language instead of an L2 to most of the native Cantonese speakers (Fu, 1987, as cited in Bolton, 2000). Yau (1989, 1993, as cited in Bolton, 2000) stated that Hong Kong was a monoethnic society and a monolingual Cantonese-speaking community. Nevertheless, this was challenged by various Hong Kong sociolinguists (Afendras, 1998; Bacon-Shone & Bolton, 1998; Patri & Pennington, 1998, as cited in Bolton, 2000) because the data of census and language survey revealed that the number of Cantonese speakers who claimed to speak English well rose drastically while those who declared that they did not speak English at all dropped from the 1980s to 1990s. Bolton (2000) believed that the dramatic change of the spread of English throughout the community was largely due to primary and secondary reforms in the 1970s and the university reforms in the late 1980s and early 1990s (p. 275). Furthermore, Filipinos, who constitute the largest group of the non-Chinese minorities in Hong Kong and are usually the domestic helpers, "make a linguistic contribution to the society in providing an opportunity for the children of such families to gain an early facility in spoken English" (Bolton, 2000, p. 276). They do not only serve as caretakers but also live-in English tutors for the children in the middle-class families.

English is undoubtedly extensively used in different sectors, including education, law, government, business and so on, but it does not imply that English language is commonly spoken by the Cantonese speakers in Hong Kong since Cantonese is still the primary language spoken by the majority of the Hong Kong population for the informal daily-life purpose. However, Cantonese speakers from the middle-class families tend to have more opportunities of speaking English frequently because their well-off family background and better educational background allow them to have more contacts with English speakers. This study will show the oral English language use of the Cantonese speakers in Hong Kong and will discuss the relationship between the frequency of oral English use and social class.

1.4 Organization of the Thesis

This thesis consists of six chapters. In Chapter 2, an introduction of Cantonese and English consonants will be presented. In addition, a review of the effect of extralinguistic factors, including gender, age, social class, frequency of oral English language use, and speech style, as well as linguistic factors on linguistic variation will be shown. Based on the findings in the review, the pilot study was carried out and the results will be demonstrated after the review. The last part in Chapter 2 will delineate the four research questions in the main study. The methodological framework regarding the background of the participants, the research design, along with the procedures of data collection and analysis will be provided in Chapter 3.

Chapter 4 will focus on the results and the findings of the present study. This chapter is divided into two parts, the descriptive results and the VARBRUL statistical results. The production of the English consonants regarding the seven factor groups and the findings of the 15 consonants will be discussed under the descriptive results. Next, the VARBRUL statistical results, consisting of the findings of accurate production, feature change, and deletion of the English consonants, will be analyzed.

In Chapter 5, the findings of Chapter 4 regarding to the four research questions will be discussed. Research Question 1 will focus on the discussion of the effect of the demographic factors, including gender, age, and social class, on the pronunciation of English consonants by the participants. In Research Question 2, the performance of the participants in different speech styles and the effect of speech style will be shown. Research Question 3 will discuss the significance of frequency of oral English language use on the three types of English production. Finally, the effect of linguistic environment and syllable/word position on the English consonants production will be discussed in detail in Research Question 4. Besides, the variation of the target English singleton consonants and consonant clusters will also be explained based on the Markedness Differential Hypothsis (Eckman, 1977) and Cantonese language transfer.

Chapter 6 will provide the summary of the study and its subsequent pedagogical implications for the Hong Kong context. Limitations of the current study and suggestions for further studies will also be presented. A conclusion will be made at the end of this chapter.

Chapter 2

Literature Review

2.1 Introduction

This section will be divided into three major parts, a) an overview of Cantonese and English consonants; b) the effect of extralinguistic factors on linguistic variation; and c) the effect of linguistic factors on linguistic variation. The review of Cantonese and English will start with an introduction of consonants in Cantonese and English followed by the research about fricatives, nasal, approximants, and consonant clusters in English produced by Cantonese speakers. The target singleton consonants /f, v, θ, ð, r, n, l/ and consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/ in the current study will be focused on in the review. Since Hong Kong was a British colony, British English is the focus in the present study. After the summary of the features of English spoken in Hong Kong, studies about the effect of extralinguistic factors, such as social class, age, gender, speech style, and language use will be discussed. In the final part of the literature review, studies about the effect of linguistic factors on linguistic variation will be presented.

2.2. An Overview of Cantonese and English Consonants

2.2.1 Introduction of Consonants in Cantonese and English

The Cantonese inventory consists of 19 consonants, eight stops /p, b, t, d, k, g, kʷ, gʷ/, three fricatives /f, s, h/, two affricates /ts, dz/, three nasals /m, n, ŋ/, and three approximants /l, w, j/ (Bauer & Benedict, 1997; Bourgeric, 1990; Matthews & Yip, 1994). All 19 Cantonese consonants appear word-initially while only voiceless stops /p, t, k/ and nasals /m, n, ŋ/ also occur word-finally. English has more consonants than Cantonese and there are six stops /p, b, t, d, k, g/, nine fricatives /f, v, θ, ð, s, z, ʃ, ʒ, h/, two affricates /tʃ, dʒ/, three nasals /m, n, ŋ/, and four approximants /l, w, r, j/ among the 24 consonants in English (Roach, 2005). All English consonants, except /h/ which does not occur syllable- or word-initially, appear in both syllable-initial and syllable-final position.

In terms of the number of syllables, Cantonese only allows monosyllabic words while English consists of words with different numbers of syllables. The possible syllable structure of Cantonese is V (vowel), C (consonant) V, VC, and CVC (Bauer, 1995, as cited in Chan & Li, 2000). There are more possible combinations of syllable structure in English, from zero to three consonants in onset position (before a vowel within a syllable) and from zero to a maximum of four consonants in coda position (after a vowel within a syllable).

In the next section, the 15 variables /f, v, θ, ð, r, n, l, pl, pr, bl, br, kl, kr, gl, gr/ focused in this study will be introduced in detail with a review of them in English spoken by Cantonese speakers, which is regarded as Hong Kong English (Bolton, 2000; Deterding, et al., 2008; Kirkpatrick, Deterding, & Wong, 2008; Hung, 2000).

2.2.2 Fricatives, Nasals, and, Approximants in Cantonese and Hong Kong English

In English, there are nine fricatives, including labio-dental fricatives /f, v/, dental fricatives /θ, ð/, alveolar fricatives /s, z/, palato-alveolar fricatives /ʃ, ʒ/, and glottal fricative /h/. Unlike English, which has both voiceless and voiced fricatives, Cantonese only has three voiceless fricatives, which are labio-dental fricative /f/, alveolar fricative /s/, and glottal fricative /h/. Three Cantonese fricatives are articulated similarly as those in English and they were not found to be difficult in both onset and coda positions in English for Cantonese speakers (Chan, 2007; Chan & Li, 2000; Hung, 2000). However, it has been documented that the rest of the English fricatives, especially the voiced fricatives, create difficulty for Cantonese speakers of English and devoicing of voiced fricatives is common (Bolton & Kwok, 1990; Chan, 2006a; Chan, 2007; Chan & Li, 2000; Eckman, 1981; Edge, 1991; Hung, 2000). Chan and Li (2000) provided a report of a contrast of English and Cantonese phonology and demonstrated the English pronunciation difficulty of

Cantonese speakers. They stated that voiced labio-dental fricative /v/ was devoiced to voiceless fricative /f/ word-finally, for example *live* /laɪf/ instead of /laɪv/ was articulated, while /v/ was replaced by /w/ word-initially, for instance, *van* /væn/ was produced as /wæn/. Hung (2000) investigated the production of English vowels and consonants of 15 Cantonese speakers of English. The data were collected from the reading of three word lists of the participants. Similar to the findings in Chan and Li's study, Hung concluded that the phoneme /v/ did not exist in Hong Kong English, but /w/ and /f/ existed instead. For dental fricatives /θ, ð/, it has been found that Cantonese speakers substituted /f/ for /θ/ while /ð/ was articulated as /f/ word-finally and /d/ in the initial or intervocalic position in a word (Bolton & Kwok, 1990; Chan & Li, 2000; Deterding, et al., 2008; Hung, 2000). Examples are the pronunciation of *this* /ðɪs/ as /dɪs/ and *brother* /brʌðə/ as /brʌdə/.

Variation of the alveolar nasal /n/ and the alveolar lateral /l/ has been reported in both Cantonese (Bauer & Benedict, 1997; Bourgerie, 1990; Matthews & Yip, 1994) and Hong Kong English (Bolton & Kwok, 1990; Chan & Li, 2000; Deterding et al., 2008; Hung, 2000; Lam, 2004). Both /n/ and /l/ occur in initial and final position in English; however, /n/ only has one phone which is [n] while /l/ consists of two phones in complementary distribution, the clear [l] and the dark [ɫ]. The clear [l] appears before a vowel and the dark [ɫ] appears after a vowel (Roach, 2005).

The articulation of the clear [l] is similar to "an [i] vowel, with the front of the tongue raised" (Roach, 2005, p. 61) and the dark [ɫ] resembles "a [u] vowel, with the back of the tongue raised" (p. 61). In Cantonese, /n/ appears in initial and final positions in a syllable and the articulation is highly similar to that in English; yet, only clear [l] before a vowel exists in Cantonese while the dark [ɫ] is absent.

According to the previous studies (Bauer & Benedict, 1997; Bourgerie, 1990; Matthews & Yip, 1994), /n/ and /l/ variation in onset position is common among Cantonese speakers, especially for the younger generation. As Bauer and Benedict (1997) suggested, Cantonese speakers do not only have difficulty in perceiving the difference between initial /n/ and /l/ in Cantonese, but they also fail to hear and produce these sounds in English, for example, *low* /ləʊ/ and *no* /nəʊ/. Variation of English /n/ and /l/ in onset position has been reported to be frequent in Hong Kong English (Bolton & Kwok, 1990; Chan & Li, 2000) and the studies by Deterding, Wong, & Kirpatrick (2008), Hung (2000), and Lam (2004) confirmed the occurrence of initial /n/ and /l/ variation in English produced by Cantonese L2 speakers of English. Several studies (Bolton & Kwok, 1990; Chan & Li, 2000; Hung, 2000) pointed out that /n/ and /l/ were in free variation with the replacement of /n/ by /l/ as well as the pronunciation of a "nasalized /l/" (Bolton & Kwok, 1990; Chan & Li, 2000). Also, the result of Hung's (2000) study did not demonstrate a systematic pattern of this phonological variation because particular participants frequently interchanged /n/ and /l/ in the same word. Hung also suggested that there was a special phonological pattern of "nasal harmony" or "nasal spreading" (p. 352) which implies initial /l/ is more likely to be pronounced as /n/ when a nasal appears within the same syllable; however, /n/ is less likely to be produced as /l/ in onset position with the presence of another nasal within the syllable. Although Hung pointed out that /n/ and /l/ were likely to be in free variation, Deterding et al. (2008) concluded that "use of [l] in place of [n] is rather more common than the inverse" (p. 160) and the possible reason was the rising substitution of /l/ for /n/ in Cantonese. Unlike the data collected from the word-list reading in Hung's study, the data obtained by Deterding et al. was from interviews, which were natural conversation. Therefore, it is difficult to generate a conclusion of the pattern and reason for initial /n/ and /l/ variation from the results of these two studies.

For English /n/ in syllable-final position, it is occasionally deleted if it follows a diphthong, such as *mine* /maɪn/ is articulated as /maɪ/ (Bolton & Kwok, 1990; Chan & Li, 2000). Yet, initial /n/ has been examined more frequently than final /n/ in the English pronunciation of Cantonese speakers. As mentioned above, Cantonese speakers do not encounter difficulty in articulating English /l/ in onset position. However, due to individual differences, some Cantonese speakers may occasionally pronounce English /l/ as /n/ in word-initial position. Since /l/ in coda position is absent from the Cantonese language inventory, dark [ɫ] is either omitted or replaced by a vowel [u], known as /l/ vocalization, since dark [ɫ] and [u] are articulated similarly with the raising of the back of the tongue toward the velum (Bolton & Kwok, 1990; Chan & Li, 2000; Deterding et al., 2008). The findings indicate that Cantonese speakers may have problems producing dark [ɫ] in English because it does not appear in Cantonese. For instance, the word *will* /wɪl/ is pronounced as /wɪu/ with lip-rounding (Bolton & Kwok, 1990; Chan & Li, 2000). Dark [ɫ] is also deleted in words like *oral* /ɔ:rəl/ which is produced as /ɔ:roʊ/ (Bolton & Kwok, 1990). Hung (2000) found a similar result that /l/ was deleted when it was preceded by a back vowel while /l/ was realized as a velar glide [w] if it appeared after other vowels. For instance, *call* and *feel* were articulated as /kɔ:/ and /fiw/ respectively. However, /l/ was not deleted in words, such as *calling* and *cooling,* since /l/ occurred in onset position instead of coda position in this case. The phenomenon of dark [ɫ] vocalization and deletion were also documented by Deterding et al. (2008) who pointed out that dark [ɫ] vocalization is common in various varieties of British English. It has been suggested by Wells (1982, as cited by Deterding et al., 2008) that /l/ vocalization would become the standard because its common use by native English speakers. Hence, the scholars concluded that deletion of dark [ɫ] after a back vowel may become a feature of Hong Kong English..

The palatal-alveolar approximant /r/ appears in both word-initial and word-final position in English but it is absent in Cantonese. Chan and Li (2000) reported that Cantonese speakers had problems producing /r/ word-initially as they replaced /r/ with /l/ or /w/. For example, *ride* /raɪd/ was pronounced as /laɪd/ or /waɪd/. On the contrary, Hung (2000) found that the majority of the participants pronounced /r/ correctly in syllable-initial position and there were only few participants who realized /r/ as /w/ in all environments.

The findings of the previous studies (Bolton & Kwok, 1990; Chan, 2007; Chan & Li, 2000; Deterding et al., 2008; Hung, 2000) about Hong Kong English indicate that it is necessary to find out whether Cantonese L2 speakers of English from different backgrounds would generally have the similar pronunciation problems, which is one of the foci in the current study. Also, this research study explores whether Cantonese L2 speakers of English will have more accurate pronunciation of the English consonants which also exist in Cantonese, such as /f/, /n/, and initial /l/, than those that are non-existent in Cantonese, for example /v/, /θ/, /ð/, and /r/.

2.2.3 Consonant Clusters in Hong Kong English

As introduced previously, Cantonese has a simpler syllable structure with a maximum of one consonant in onset and coda position. Unlike English, which may have a maximum of three consonants in onset position and four consonants in coda position (Roach, 2005), consonant clusters are absent in Cantonese. Among studies of phonetics and phonology in Hong Kong English, initial and final consonant clusters produced by Cantonese L2 speakers of English have been discussed briefly in several studies (Bolton & Kwok, 1990; Chan & Li, 2000; Deterding et al., 2008; Hung, 2000) but there have been only a few in-depth studies concerning the production of English consonant clusters of Cantonese speakers (Chan, 2006b; Pang & Setter, 2000; Yam, 2005). After the introduction of the target singleton consonants, this section aims at presenting the target initial consonant clusters, /pl, pr, bl, br, kl, kr, gl, gr/, which are focused on in the current study.

Chan (2006b) discussed the productions of the English initial consonant clusters by Cantonese L2 speakers of English. Data were collected from a word-list reading task, a picture description task, a passage-reading task, and a conversational interview. Except the onsets with a consonant and a semi-vowel, such as /j/ and /w/, all the existing English initial consonants produced in the tasks were examined in the study. In general, two-member onsets, with 80.5% accuracy, were produced more accurately than three-member onsets, which had 62.6% accuracy. The results showed that participants encountered more difficulties in producing obstruent + liquid onsets, for example, /pl/ and /tr/, than obstruent + nasal onsets, for instance,

/sm/ and /sn/. Obstruent + nasal onsets were produced with 95.7% accuracy while only about 69.4% of obstruent + liquid onsets were accurately produced. Unnecessary aspiration of stops after /s/, deletion, substitution, and vowel epenthesis were found in the study while deletion and substitution were the most commonly used.

Unnecessary aspiration of stops after /t/ appeared in both word-initial and word-medial onsets; yet, the frequency of the occurrence was low. For instance, /st/ in *star* and *sister* were sometimes pronounced as [st^h], with the aspirated /t/ after a stop. In deletion, obstruent + liquid onsets were more frequently deleted than obstruent + obstruent onsets in two-member onsets. 99.1% of the deletion was the deletion of /r/ and /l/ while only 0.9% of the deletion was the deletion of the obstruents. Examples were the deletion of /r/ in *problem* and *free* which were pronounced as /pɒbləm/ and /fi:/ respectively. The participants did not only delete /r/ and /l/, they also replaced the liquids frequently with [w] in two-member onsets. For instance, *shrimp* and *flow* were produced as /ʃwɪmp/ and /fwəʊ/ instead of /ʃrɪmp/ and /fləʊ/. Apart from the replacement of /r/ and /l/ with [w], /r/ and /l/ would be substituted by each other. *Freeze* /fri:z/ was pronounced as /fli:z/ and *problem* /prɒbləm/ was produced as /prɒbrəm/. The two-way substitution suggested that /r/ and /l/ might have been neutralized (Chan, 2006b, p. 350). Vowel epenthesis was not found to be commonly used by the participants because only one token was found in this category. In general, deletion and substitution instead of vowel epenthesis were commonly used by Cantonese L2 speakers of English when they produced initial consonant clusters.

In the study by Yam (2005), the productions of English initial and final consonant clusters of Cantonese L2 speakers of English were investigated. The study found that consonant clusters in onset position were produced more accurately than those in coda position. Yam explained that onsets are less marked than codas, which means "CV syllable structure is universally permissible but CVC structure is not" (p. 181). It is not surprising that Cantonese speakers are able to produce consonant clusters more accurately in onset position than in coda position. In fact, deletion of consonant clusters in coda position is also frequently found in the casual speech by native English speakers (Gimson, 1994; Roach, 2000; Selkirk, 1980, as cited in Yam, 2005). Similar to the results found by Chan (2006b), substitution and deletion were used the most frequently by the participants. Since consonant clusters in onset position are less marked than those in coda position, modifications of onset clusters also occurred less than those in coda clusters. However, deletion of consonant clusters in onset position appeared most frequently when compared to other modifications of onset consonant clusters. Yam explained that as Cantonese does not allow consonant clusters, Cantonese speakers possibly preferred deletion to modification so as to avoid the production of consonant clusters.

Chan and Li (2000) suggested that deletion and epenthesis were frequently used by Cantonese speakers of English when producing initial consonant clusters. Deletion refers to the reduction of the number of consonants in a consonant cluster while epenthesis involves an insertion of vowel within a consonant cluster resulting in the creation of an extra syllable. Chan and Li stated that /r/ was often deleted after a stop, for example, *produce* /prədju:s/ was articulated as /pədju:s/. In addition to deletion, substitution of /l/ for /r/, like the pronunciation of *produce* as /plədju:s/, also happened since /r/ also creates difficulty for Cantonese L2 speakers of English. A study by Deterding et al. (2008) confirmed that /r/ was either deleted or replaced by /l/. However, they found that /r/ and /l/ deletion in initial consonant clusters occurred primarily after bilabial consonants /p/ and /b/, /r/ was omitted in *primary* /praɪməri/ which was pronounced as /paɪməri/, while substitution of /l/ for /r/ mostly happened with a preceding labial consonant, for instance, *crowded* /kraʊdɪd/ was pronounced as /klaʊdɪd/. While Deterding et al. reported that /r/ was commonly replaced by /l/, Chan (2006b) added that /r/ and /l/ were likely to be neutralized because there was a two-way substitution, which was the replacement of /r/ by /l/ and the replacement of /l/ by /r/. Although Chan and Li (2000) claimed that epenthesis occurred often in the production of consonant clusters by Cantonese speakers, it was found to be rare by Chan (2006b). As consonant clusters do not exist in Cantonese and there is a lack of research about this area, it is worthwhile to investigate whether Cantonese speakers encounter problems in pronouncing the clusters and whether they would produce a systematic pattern of the consonant clusters.

2.3 Extralinguistic Factors and Linguistic Variation

Five major extralinguistic factors, including gender, age, social class, speech style, and language use, will be presented in this section. The role of these factors in determining linguistic behavior has been a focus in sociolinguistic research and hence the review may help explain the findings of the present study.

2.3.1 Gender and Linguistic Variation

The definition and distinction of sex and gender have been discussed thoroughly (c.f. Chambers, 2009; Coates, 2004; Oakley, 1985; Talbot, 1998). Generally, sex is defined biologically while gender is defined socioculturally and is socially constructed based on sex. Gender, as observed by Talbot (1998), is a continuum because it can be described in degrees of masculinity and femininity. Grammatically, people could be categorized as masculine, more masculine, most masculine or feminine, more feminine, and most feminine, regardless of their sex. Sex is typically binary, either female or male, though some cases were reported as intersexed (Bing & Bergvall, 1996, as cited in Talbot, 1998). However, Chambers (2009) declared sex differences were merely probabilistic and the variation implied that "there are no *absolute* sex differences" (p. 119). He declared that biological differences should not be regarded as "innate advantages or hindrances" (p. 119) to either sex but as "innate biases" which helped people prevent from any negative effects that the bias might cause. Regarding sex differences, Chambers mentioned that there were numerous non-linguistic biological differences while the effect of biological differences between men and women on language was limited. In fact, the effect of sex differences on language is doubtful because Segal (1993, as cited in Talbot, 1998) suggested that biological differences alone would not be sufficient to completely determine people's experience and behavior. All in all, Talbot (1998) stated that when gender was mapped on to sex, there was an implication that "socially determined differences between women and men are natural and inevitable" (p. 9). The focus of gender would be the social role of men and women playing in the society. In the present study, 'gender' instead of 'sex' is more preferable in the sense that gender is socially constructed and is primarily developed based on sex.

Gender is one of the social factors which have been typically examined in sociolinguistic research but the effect of gender on linguistic variation is controversial. Some studies (Levy, 2010; Major, 2004; Milroy & Milroy, 1978; Robinson, 2001; Romaine, 1978; Trudgill, 1972, 1974) have shown that gender was influential to linguistic variation in English as a first language (L1) and found that women or girls had a more frequent use of the standard or prestige variants than men or boys. The preference for standard or prestige forms by women were largely accounted for women's consciousness of social status (Chambers, 2009; Romaine, 1978; Trudgill, 1972, 1974), linguistic insecurity (Labov, 2006; Adamson & Regan, 1991), avoidance of being viewed as the lower class (Gordon, 1997), and frequent social networking (Milroy & Milroy, 1978; Cameron, 2009). Apart from the above research on English of native English speakers, studies on learners of FSL (Mougeon, Nadasdi, & Rehner, 2001; as cited in Regan, Howard, & Lemée, 2009; Mougeon & Rehner, 2001; Rehner, Mougeon, & Nadasdi, 2003; Uritescu, Mougeon, Rehner, & Nadasdi, 2004) and English as a second language (ESL) (Adamson & Regan, 1991; Major, 1994) also found that there was a significant effect of gender on linguistic variation. However, gender was not found to be significant in other studies (Dewaele, 2004; Irwin & Nagy, 2007; Purcell & Suter, 1980; Rehner & Mougeon, 1999; Suter, 1976).

The following studies help explain how gender plays a role in linguistic change. Trudgill (1972, 1974) investigated the correlation between the variation of the phonological variables and the sociological variables, including social class, gender, and speech style, in his sociophonetic study in Norwich. He pioneered the idea of gender differentiation which stated that the possible explanation of women's frequent use of the prestige variant was their consciousness of social status, which led to women's higher awareness of "the social significance of linguistic variable" (Trudgill, 1972, p. 182). A classic instance is the sex differentiation of the suffix *–ing* in words like *talking* and *walking* in Norwich English. There are two possible pronunciations of *–ing* in Norwich English, the prestige form [ɪŋ] and the non-standard form [ən] or [n̩]. The result revealed that women used the standard form [ɪŋ] more frequently than men and it indicated that women preferred using the prestige standard form more than men. Trudgill suggested that women were more conscious about their status than men and so they were concerned about "the social significance of linguistic variables" (p. 182). There were two reasons for this phenomenon. Trudgill explained women were generally subordinate to men and thus the social position of women was less secure than that of men. As it was essential for women to "secure and signal their social status linguistically" (p. 182), they were aware of the importance of using linguistic symbols. Compared to men who could be rated socially by their occupation, power or other abilities, women were possibly rated by other signals of status, such as speech, and hence it was crucial for women to demonstrate their success and positive image or identity by using prestige linguistic variables. Women's greater consciousness of the social status due to their less secure social position in the society led to the frequent use of prestige variants and it was defined as "overt prestige" (Trudgill, 1972), which was necessary for women to secure and symbolize their social status linguistically. On the contrary, the common use of non-standard variants by men connoting masculinity and toughness in the working class was defined as "covert prestige" (Trudgill, 1972). Labov (1972) pointed out the stigmatized forms were less used by women who were "more sensitive than men to overt sociolinguistic values" (p. 243). In other words, gender difference is attributed to speakers' attitude towards status and solidarity. Coates (2004) also had a similar view that speakers were more likely to acquire greater status when they spoke with standard norms. It was because research by social psychologists confirmed that Received Pronunciation (RP) was more prestigious than regional dialects in Britain. A social psychological research (Elyan et al., 1978, as cited in Coates, 2004) showed that women who spoke with the RP accent were judged as "being more fluent, intelligent, self-confident, adventurous, independent, and feminine than women with a regional accent" (p. 66). Women might prefer using standard norms to reveal their status but men would use nonstandard variants to mark their membership and signal their solidarity with the members in the same social groups.

Eckert (1989) agreed with Trudgill (1972) and pointed out that women's preference of standard variants was due to their "powerless position in society" (Eckert, 1989, p. 249) which did not allow women to proceed to a higher status or power through performing tasks. Hence, it was necessary for women to use other symbolic signals, for example, linguistic behavior, to advance their social position. On the contrary, men were able to acquire power or status by performing tasks or displaying skills. Coates (2004) also deduced from previous research (Macaulay, 1977, 1978; Newbrook, 1982; Trudgill, 1974, as cited in Coates, 2004) that "women's sensitivity to linguistic norms" (p. 61) was attributed to their insecurity of social position. The lower-middle-class women used the less prestigious variant in the least formal task, but their use of the standard variant increased when style shifted to more formal tasks. The linguistic behavior of the lower-middle-class speakers was regarded as "hypercorrection" (Coates, 2004, p. 51). Hence, women's sensitivity to linguistic norms resulted from an insecure social position and then led to hypercorrection that there is a difference between men and women. Insecurity of social position might lead to linguistic insecurity as prestige variants were preferred to compensate the relatively powerless women social status; hence, it was suggested that women were more sensitive to their linguistic behavior.

Apart from the alternate explanations of linguistic insecurity, Cameron (1988, p. 5-6, as cited in Chambers, 2009) criticized the concept of women's consciousness of social status:

> that methodology, measuring instruments and scoring systems, theoretical assumptions and individual interpretations have been, in sociolinguistics as elsewhere, riddled with bias and stereotype; and that this bias must not be ignored, because studies of 'difference' are not just disinterested quests for truth, but in an unequal society inevitably have a political dimension. (p. 143)

The connection of social status or social class of women and their linguistic behavior is perhaps a more traditional way to explain gender differences in linguistic variation.

Besides linguistic insecurity, Milroy and Milroy (1978) suggested that social network might play a role in gender differentiation in phonological variation. This study showed that women used more standard variants than men who preferred the non-standard variants which had "conscious vernacular prestige" (p. 25) among men. Social networks were related to gender differences in linguistic behavior in a way that men usually belonged to a close-knit group and had more use of the vernacular variants while women commonly belonged to a loose-knit group which led to more use of the standard variants as well as higher variability. In the highly industrialized area in Belfast, the majority of men worked locally without crossing the territorial boundaries. Such a strong social network ties reinforced the use of linguistic 'norm', which was the vernacular forms regarded by the men in Belfast. That was why they showed "most markedly the typical allophonic variation of the vernacular" (Milroy & Milroy, 1978, p. 24), as one of the means for men to display their vernacular prestige among the close-knit peer groups. On the other hand, women's social movement was less constrained than men since they would travel to the neighborhood city to work or carry out their social activities, for example, shopping and meeting friends, in other areas. Therefore, women had a relatively looser neighborhood ties which allowed them to extend the social circle and hence they became linguistic innovators with a wider repertoire of linguistic variables while standard form was still preferred to signal their social status. The study by Milroy and Milroy did not only show the role of gender differentiation in phonological variation, but it explained gender differences were likely to be correlated with social network and social class that participants at different age groups would have particular experiences and behaviors to reveal their social position. The concept of social network relating to social class will be presented in Section 2.3.3.

Apart from the studies on English as an L1(Coates, 2004; Marshall, 2003; Milroy & Milroy, 1978; Robinson, 2001; Romaine, 1978; Trudgill, 1972), research on L2 (Mougeon et al., 2001, as cited in Regan et al., 2009; Mougeon & Rehner, 2001; Rehner et al., 2003; Adamson & Regan, 1991; Major, 1994) also reported the significant effect of gender on linguistic variation. The study by Mougeon and Rehner (2001) about the use of *ne…que, seulement, rien que,* and *juste*, meaning 'only' in French, found that women favored the use of standard variant, that is *seulement*. Rehner et al. (2003) investigated the use of *nous* and *on*, meaning 'we' in French, by FSL learners. *Nous* is the formal variant which is socially and statistically highly marked in Canadian French while *on* is the vernacular variant. The study found that women favored the use of *nous*, which is the standard and prestige variant associated with higher social class. The result implied that women "had internalized the effect of gender observable in the L1 communities in which they were immersed" (Rehner et al., 2003, p. 150).

Gender was also found to have a significant effect on phonological variation in English in the research on ESL learners (Adamson & Regan, 1991; Major, 1994; Major, 2004). Adamson and Regan (1991) examined Vietnamese and Cambodian immigrants' pronunciation on the variable *–ing*, which had the standard variant [ɪŋ] and the nonstandard variant [ɪn]. The finding showed that the prestige variant [ɪŋ] was more frequently used by women than men. This was illustrated with Trudgill's (1972, 1974) idea of women's use of standard variant and the common use of nonstandard variant by men having connotations of masculinity and toughness. It was likely that men perceived the nonstandard variant [ɪn] as a marker for men; hence, [ɪn] was the prestige form for them. Adamson and Regan added that this could be resulted from men's greater exposure to informal English in the working class in which [ɪn] frequently appeared. Major (1994, 2004) examined Japanese and Spanish English speakers and also found that gender was statistically significant for phonological variation in English. The results revealed that women used fewer informal variants than men in both sentences and phrases.

Although the above research has shown that gender was a significant factor in linguistic variation and the reasons for women's preference of prestige or standard variants, other studies had contrary findings that gender was not found to be significant for linguistic variation (Dewaele, 2004; Irwin & Nagy, 2007; Purcell & Suter, 1980; Rehner & Mougeon, 1999; Suter, 1976).

Irwin and Nagy (2007) conducted a quantitative study by examining the use of postvocalic /r / in Bostonian speech of 24 participants, 12 men and 12 women in three age groups. Rhotic /r/ is the prestige variant in Boston while the vocalization of /r/ is the non-standard form, which started to spread widely only after the American Revolution. The study demonstrated a decline of rhotic /r/ in Boston and it has become a continuous trend as found in other studies (Bloch, 1939, as cited in Irwin & Nagy, 2007; Labov, 2006). Research studies on the use of rhotic /r/ (Fisher, 1958; as cited in Levy, 2010; Labov, 2006; Levy, 2010) have found that women had a more frequent use of /r/ than men; yet, Irwin and Nagy reported that women and men had the same rate of /r/ deletion. When age and gender were analyzed simultaneously, it was found that the use of /r/ was more frequent in the youngest groups of both men and women. The result indicated that age had a stronger effect which overrode gender on the use of /r/. In addition, Levy (2010) explained the difference of the findings might be attributed to the speech style because the data of Irwin and Nagy's study were collected from careful speech while the data of Levy's study were collected through a "Rapid and Anonymous" (Labov, 2006) paradigm, that is casual speech. The participants, who were required to read a passage, were possibly more attentive to their pronunciation. Thus, men might produce the rhotic /r/ more frequently in careful speech, which led to a similar production with the women participants, than casual or informal speech.

Studies (Dewaele, 2004; Purcell & Suter, 1980; Rehner & Mougeon, 1999;

Suter, 1976) of linguistic variation of ESL and FSL learners also revealed that gender was not a significant factor. Suter (1976) examined the English pronunciation of Arabic, Japanese, Persian, and Thai speakers of English and investigated the factors which facilitated accurate English pronunciation of the 61 non-native English speakers. There were 20 predictor variables, such as gender, amount of English conversation with native English speakers at home, at work, and at school, amount of formal classroom training of English pronunciation, speakers' native language, and the strength of speakers' concern about their English pronunciation, being analyzed in the study. The results revealed that 12 variables were found to be significant while eight variables were not significant. Gender was one of the non-significant predictors for accurate pronunciation and the finding indicated that language superiority of women did not appear in the English pronunciation of the women participants, who were not found to have better pronunciation than men. Later, Purcell and Suter (1980) reexamined Suter's study because they pointed out the weakness of Suter's study that the relative importance of the significant predictors was not assessed, so it was impossible to determine which of the significant predictors were influential to accurate production and which were only significant as a result of the substantial correlations with the more efficient predictors of accurate pronunciation. Among all the 20 predictors, only four predictors, that were the L1 of the participants, aptitude for oral mimicry, residency (duration staying in an English-speaking country and with native English speakers), and strength of concern for accurate pronunciation, were the most statistically significant for English pronunciation. Gender was found to be correlated with cultural allegiance; yet, it was not significant for accurate pronunciation and the reason for the correlation was left unknown.

Both studies by Dewaele (2004) and Rehner and Mougeon (1999) examined the use of the French negative particle *ne* by learners. *Ne* is a negation appears as a pre-verbal verb form in French. *Ne* is required in written form and formal oral speech, but it is frequently deleted in informal speech. Rehner and Mougeon investigated the linguistic variation in the French speech of 40 immersion students, who were 30 girls and 10 boys from Grade 9 and 12. It was hypothesized that girls favored standard variant and had a higher level of the use of *ne* in French than boys. However, gender was not found to have no significance for the use of *ne*. Since the effect of gender on linguistic variation was often weaker than that of socioeconomic background and its correlation with the use of *ne* ranking the fifth among the 10 factors was relatively weak, it was not surprising that gender was not significant for the variation in the study. Dewaele (2004) conducted a similar research on the variation of *ne* by investigating 73 university students, 40 women and 33 men.

Similar to Rehner and Mougeon's study, women were expected to have a lower rate of *ne* deletion in conversation, but gender was not found to be statistically significant for the deletion. Women did not omit *ne* significantly less than men, and this finding could account for the relatively weak connection of socio-demographic variables and the *ne* deletion. Instead, personality and the frequency of the use of French strongly influenced the deletion rate of *ne*. The above studies have shown that gender was found to have little or no effect because other factors might have a stronger effect on linguistic variation over gender which might have a correlation with other factors.

The effect of gender is controversial because previous research studies on the linguistic variation of native English speakers, ESL and FSL learners found that gender was significant (Adamson & Regan, 1991; Cheshire, 1998; Levy, 2010; Major, 1994; Major, 2004; Marshall, 2003; Milroy & Milroy, 1978; Mougeon, Nadasdi, & Rehner, 2001; as cited in Regan, Howard, & Lemée, 2009; Mougeon & Rehner, 2001; Rehner et al., 2003; Robinson, 2001; Romaine, 1978; Trudgill, 1972, 1974; Uritescu, Mougeon, Rehner, & Nadasdi, 2004) while some studies showed that gender was not significant for linguistic variation (Dewaele, 2004; Irwin & Nagy, 2007; Purcell & Suter, 1980; Rehner & Mougeon, 1999; Suter, 1976). In order to find out whether gender is influential to the English pronunciation of Cantonese speakers and the reasons for the findings in the context of Hong Kong where men and women share a high level of equality, gender is taken into account in the present study.

2.3.2 Age and Linguistic Variation

Some studies have found that age plays a major role in linguistic variation (Labov, 1972; Marshall, 2003; Bayley, 1995) since the older generation tend to use the standard variant of a sound and resist changing while the younger generations are language innovators who prefer following new trends.

Labov (1972) conducted a research study on Martha's Vineyard, which is an island located in Massachusetts in the United States, about linguistic change in progress by focusing on the variable of the diphthongs /aɪ/ and /aʊ/. Since Martha's Vineyard is socially and geographically complex, abundant differentiation of linguistic variants can be found by linguists. Among numerous linguistic variables, /aɪ/ and /aʊ/ were selected specifically due to their frequent occurrence in words and emergence across an extensive range of age levels and other social stratification. In the 1951 *Linguistic Atlas of New England*, /aɪ/ was found to be produced as a centralized [əɪ] while there was only little centralization of /aʊ/ and these centralized diphthongs were the characteristics of Martha's Vineyard. There were 69 speakers in both genders and in different age groups from three ethnic groups, including

English descent, Portuguese, and Indian, participating in the study. They were from different occupations, such as fishing, farming, construction, and service trades. The data were collected through formal interviews as well as reading, and about 3,500 and 1,500 instances of /aɪ/ and /aʊ/ were elicited respectively.

In terms of the geographical location, speakers from 'Up-island', where was rural areas with small towns, were more likely to produce the centralized diphthongs than those from 'Down-island', which was more developed. Regarding the age level of the speakers, centralization of the two diphthongs varied in different age groups, including the age groups of 14-30, 31-45, 46-60, 61-75, and above 75. The phenomenon appeared more frequently with the rise of age, reaching the peak at the group of age 31-45. However, centralization was less common with the increase of age after age 45 and the age group above 75 had the least centralization of the two diphthongs. Labov (1972) explained that speakers in the age group of 31-45 had gone through the economic recession, and it was difficult to make a living in a new place that they determined to stay on the island of Martha's Vineyard instead of leaving it. The deliberate choice of maintaining their identity as a Vineyarder caused this group of speakers to produce the centralized diphthongs intentionally. However, the speakers at the youngest age group yielded a lower number of centralized diphthongs. This result was likely to be on account of their being high-school students. Although these students were from the traditional families which typically used centralized diphthongs, they did not intend to stay on the island and thus it led to a lower number of centralization of /aɪ/ and /aʊ/. A sharp contrast was noted between speakers who desired to leave and those who planned to stay because the former had little or no centralization while the latter produced numerous centralized diphthongs. Yet, the low rate of centralization of these sounds among the oldest and the youngest speakers is unexplainable and there may be a secondary factor governing the production over various age groups.

In Marshall's (2003) study of glottal stop [ʔ], which is the variant of /t/ in British English, there were a total of four age groups, 8-12, 14-17, 25-40, and over 60. Generally, adolescents adopted the use of the new variant [ʔ]. The data showed that the oldest group did not use any [ʔ] while there was a rise of the use of [ʔ] as the age decreased, and [ʔ] was produced the most by speakers aged between 14 and 17. Age had an impact on variation in Marshall's study but still there was an inconsistency, which will be discussed in the next section, in the production of speakers aged between 8 and 12, especially for women who resisted changing the alveolar stop [t] into the glottal stop [ʔ].

Other studies reported that age had little or no effect on linguistic variation (Dewaele, 2004; Labov, 1972; Romaine, 1978). Another study conducted by

Labov (1972) focused on the pronunciation of the postvocalic /r/ by New Yorker, and the result showed that age differentiation was not consistent with the general pattern as the change of variable among the age groups was not apparent. In this study, /r/ was the linguistic feature of New Yorker speech considered, and Labov expected that younger people should pronounce more of this prestige form, which is particularly emphasized in native New York City speech. Labov (1972) stated that a possibility of the sources of errors in quick and anonymous speech caused this unpredictable result. The study of Scottish /r/ by Romaine (1978) investigated the phonological variation of Scottish children and it found that there was no effect of age on the production of postvocalic /r/ in Scottish English because the speakers aged six, eight, and ten years old behaved in a similar way. However, it is very likely that only a two-year interval of participants' age could not generate a great difference in the production. In the research of English speakers of French, Dewaele (2004) investigated retention or deletion of the *ne*, which is a pre-verbal negation in French, by other L2 speakers. He hypothesized that older speakers were less likely to delete *ne* but the result revealed that the negative correlation between the age of participants and the deletion rate of *ne* was insignificant.

The effect of age on linguistic variation and its reason is contingent upon the culture and social background of the places where research studies are carried out.

It would be interesting to examine whether age is significant for the English pronunciation of Cantonese speakers in Hong Kong in the present study because Hong Kong is a socially and culturally diverse city which is constituted by people from various backgrounds.

2.3.3 Social Class and Linguistic Variation

Social class has always been one of the important factors examined in linguistic variation from the sociolinguistic perspective and it has been defined in different ways. Social class is used to "denote a large-scale grouping of people sharing some socio-economic characteristics which have a strong influence on their lives" and "such socio-economic characteristics include ownership of property, income, education, and occupation." (Leung, 1996, p. 29). Social class can be defined as social stratification which refers to "any hierarchical ordering of groups within a society" (Trudgill, 1995, p. 23). Stratification is taken into social class which may explain phonological differences; thus, there are different social-class accents. Stratification of social class was not universal because it depends on the structure, development, culture, and history of different societies. Due to the complexity of the linguistic situation in various societies, social classes are hardly defined clearly but it is possible to aggregate similar social mobility, social and economic characteristics of people. It would be challenging to identify a particular linguistic variation because the heterogeneity of a society would determine the complexity of the language in the society (Trudgill, 1995).

The study of New York City by Labov (1972) was a pioneering research study on sociolinguistic variation. The variable /r/, which is regarded as a representative phonological marker (a prestige form) of New York City speech, was the focus in the study. In the study, social class was found to be influential for the linguistic variation of New York speakers who were staff in three department stores. The variable /r/ was the main focus in the study as Labov explained that "this particular variable appeared to be extraordinarily sensitive to any measure of social or stylistic stratification" (p. 44). There were two notions which made the study possible and feasible to be carried out. First, /r/ is a social differentiator in distinct levels in New York City speech, and second, the systematic study of language may involve rapid and anonymous speech (Labov, 1972). The speech by salespeople in the three selected department stores, which were Saks Fifth Avenue, Macy's, and S. Klein, were recorded in the study. The department stores were ranked from the top to the bottom based on the price and fashion scale of their products, and the customers were expected to be socially stratified. Labov stated that the occupation of a speaker was highly correlated with his or her linguistic behavior since the salespeople in renowned department stores had a tendency to borrow the prestige variants from their customers. It was thus hypothesized that salespeople in the most prestigious store would produce the highest number of /r/ while those in the bottom-ranked store would have the least number of /r/.

The finding conformed to the hypothesis of the stratified distribution of /r/ in the three department stores. The salespeople in Saks, the highest-ranked department store, produced the highest percentage of /r/ while those in S. Klein, which was the bottom-ranked store, had the least /r/ production. The result, by and large, confirmed the hypothesis which predicted the frequency of /r/ pronunciation was positively correlated to the stratification of the three department stores.

Recently, Irwin and Nagy (2007) and Levy (2010) carried out similar sociolinguistic research studies on Boston /r/. Irwin and Nagy (2007) pointed out that the vocalization of /r/ in a syllable-coda position (stated as "R-dropping") have been examined in various dialects (Feagin 1990; Foulkes & Docherty 2001; Hay & Sudbury 2005; Yaeger-Dror, 1991, as cited in Irwin & Nagy, 2007), but quantitative analysis of Boston /r/ has not been done previously. Same as New York, rhotic /r/ is a prestige and standard variant in Boston while vocalized /r/ is a nonstandard variant (Levy, 2010). Irwin and Nagy (2007) analyzed the use of postvocalic /r/ by Bostonians with phonological and social factors. 12 men and 12 women, who were native Bostonians and passers-by in public areas, aging from 19 to 81 were asked to read a story. The researchers grouped the participants in three income groups (>$50,000, $40,000-50,000, <$40,000) by estimating their annual salary based on their occupations. Although the difference among the three income groups was not great, the result still demonstrated that the higher annual income group (p' .59) favored retention of rhotic /r/ over the lower income groups $40,000-50,000 ($p'$ .31) and <$40,000 ($p'$ .50). However, the result might not be highly reliable as the levels of social class of the participants were estimated.

Levy (2010) also found that social class had a significant effect on the use of postvocalic /r/ in Boston. Participants were selected by two conditions that they were either at work or on the way to Fenway Park to attend the American League Championship Series (ALCS). For the participants who were at work, their occupations were identified by their uniforms or the tasks they were doing. Those who were going to the ALCS were identified by their Red Sox clothing and they were categorized as in the high social class. Since Fenway Park offered the highest average ticket price, the researcher estimated that the attendees were likely from the high social class. The data were obtained from participants who responded to two questions which possibly led to the answer of a subway stop 'Kenmore'. The finding showed that the higher the social class, the lower the percentage of /r/ vocalization. As rhotic /r/ is considered as the prestige variant in the United States and Boston is the hub of commerce and academia, which is regarded as high-class industries, Levy (2010) concluded that Bostonians from the high social class would be likely to adopt the prestige variant.

Besides the variation in English of native English speakers, there are sociolinguistic studies on the variation in French of FSL learners. For example, in the study of Rehner and Mougeon (1999), the use of the French negative particle *ne* by immersion students was investigated. Three types of variants, which were generally categorized as "vernacular, mildly marked, and formal variants" on a "sociostylistic continuum" (Rehner, Mougeon, & Nadasdi, 2003, p. 129), were often examined for the sociolinguistic variation of FSL students. Vernacular variants are used in informal speech and regarded as inappropriate in formal settings, usually related to the lower social class speakers. Same as vernacular variants, mildly marker variants do not conform to standard French and often appear in informal settings, but they can be used in formal speech. Formal variants are standard French used in formal speech and writing, and they have a strong association with speakers from the high social class. Among the three socioeconomic groups, middle class, lower middle class, and working class, it was hypothesized that middle-class participants who favored standard variants would retain the use of *ne*, which was the standard variant while deletion of *ne* was the mildly marked variant.

The finding demonstrated a positive correlation between socioeconomic background of the students and the rates of the use of *ne*. The working class had a more favorable effect on deletion of *ne* than the lower middle class while the middle class inhibited the omission of *ne*. This result implied that speakers from the higher social class preferred using the standard variant *ne* as they might resist the use of vernacular variants that possibly downgraded their social class. Rehner and Mougeon (1999) proposed that the exposure to French outside the classroom was likely to reinforce the association between social stratification and the use or deletion of *ne*. Hence, the effect of socioeconomic background as a function of amount of exposure to French outside the classroom was studied. Rehner and Mougeon pointed out that the middle-class students who had "spent the most time with francophone families (mostly in Quebec) have 'internalized' the pattern of social stratification" (p. 142). This finding conformed to that of the previous study (Sankoff & Vincent, 1980, cited in Rehner & Mougeon, 1999) which found that the use or omission of *ne* was socially stratified and the upper class native francophones produced a higher rate of the use of the particle *ne*. Even though immersion students realized deletion of *ne* was common in informal speech after interacting with francophones, it did not lead students to follow the norm of native speakers as they would have their own preference of the use of *ne* according to their socioeconomic background.

Another study (Rehner et al., 2003) about the use of *nous* and *on*, meaning 'we' in French, by FSL students also showed that social class was significant for linguistic variation. In French, *nous* is the formal variant while *on* is the mildly marker variant. The middle-class students had a more favorable effect over the upper working class students. Since *nous* is the standard variant and is strongly related to the high social class, students from the middle class would prefer the use of the prestige form.

In fact, previous studies (Elliott, 1995a; Elliott, 1995b; Lori & Al-Ansari, 2001; Purcell & Suter, 1980; Suter, 1976) have reported that language attitude and L2 pronunciation were positively related as the higher consciousness of L2 pronunciation resulted in less degree of L2 foreign accent and better pronunciation. Due to the reason for the effect of social class on linguistic variation, Cantonese speakers' attitude is also considered in explaining the effect of social class on English pronunciation.

Although social class was found to be significant in previous studies (Irwin & Nagy, 2007; Labov, 1972; Levy, 2010; Rehner & Mougeon, 1999; Rehner et al., 2003), some research studies revealed the insignificant effect of social class on linguistic variation (Marshall, 2003; Mougeon & Rehner, 2001). The finding of the effect of socioeconomic background on linguistic variation in the study by Mougeon and Rehner (2001) conflicted with the study by Rehner and Mougeon (1999). Mougeon and Rehner (2001) studied the French learners' use of *ne...que, seulement, rien que,* and *juste*, meaning 'only' in French. *Ne...que* and *seulemet* are standard variants in French and they are associated with the middle-class speech. *Juste* is a nonstandard variant but it is used more frequently among the four variants. *Rien que* is the vernacular form related to the working-class speech. It was proposed that *seulement* appeared more frequently in the speech by the middle-class students than the upper working class students; however, the effect of social class was found to be insignificant for the students' use of *seulement*. The study by Marshall (2003) investigated the rise in the use of glottal stop [ʔ] and found that social class had no significance for the variation since the glottal variant of /t/ was produced by speakers from different social classes.

In the present study, only the upper middle and the lower middle class will be taken into account due to the inaccessibility of the upper-class speakers and the lack of English knowledge of people from the working class in Hong Kong. Still, the effect of social class on phonological variation is worth studying since there is a lack of research examining the English pronunciation of Cantonese speakers in Hong Kong in relation to social class. The levels of social class of the speakers in the studies on English as an L1 (Irwin & Nagy, 2007; Levy, 2010) were estimated without sufficient information collected from the speakers. In the current study, occupation, job position, and monthly income of the participants are taken into account so as to clearly categorize the participants into the social stratification in Hong Kong. Unlike the studies about FSL students (Rehner & Mougeon, 1999; Mougeon & Rehner, 2001), the participants in the current study are people working in the society. As a labor force in the society, it is possible to reveal a real situation by obtaining their information and opinions about their English pronunciation.

2.3.4 Speech Style and Linguistic Variation

Previous studies (Bayley, 1996; Dickerson, 1975; Labov, 1972, 2006; Woods, 1991) obtained data with various speech styles, namely word list, passage reading, conversation, and interview, and speech style was found to be influential because production of standard forms in word-list reading was greater than that in conversational data.

The study of the Lower East Side in New York by Labov (2006) offered an insight to other scholars exploring the effect on linguistic variation caused by different speech styles, including minimal pairs, word lists, reading, interview, and casual speech. The variable /r/ was the focus due to its prestigious status in New York speech. Labov proposed that attention to speech paid by speakers determines the formality or informality of styles. Speakers would pay more attention to formal speech while they would pay less attention to informal speech. The result of this study showed that minimal pairs elicited the highest percentage of /r/, followed by word lists, reading, interview, and casual speech in which the use of/ r/ was the least. The overall trend demonstrated that the use of /r/ increased gradually from informal to formal styles, and it indicated that speakers were conscious about the prestige variant and would pay more attention to their speech in formal tasks than in informal tasks.

Apart from the significant effect of speech style on the linguistic variation found in the research about the English pronunciation of native English speakers, Bayley (1996) and Dickerson (1975) found a similar result by studying the English production of L2 speakers of English. Bayley (1996) investigated the effect of linguistic and social factors on final /t, d/ deletion of native Mandarin speakers of English. In the study, reading, narrative, and conversation, were used to elicit the spoken data in distinct speech styles. Regardless the English proficiency of the participants, final /t/ or /d/ was deleted most commonly in conversation while more of /t/ and /d/ were retained in the reading task. The finding was supported by Tarone (1979, 1982) who suggested that formal tasks elicited more target-like language while informal tasks elicited less target-like production. In the study by

Dickerson (1975), who investigated the English pronunciation of /z/ of Japanese speakers of English, /z/ in free morphemes, demonstratives, and pronouns were analyzed in three speech styles, which were the reading of word lists, the reading of dialogues, as well as free speaking. One of the foci was to study whether a shift in speech styles would lead to a change in the English production of Japanese speakers. The finding showed that reading of word lists elicited the highest index scores of /z/ production, followed by reading of dialogue while free speaking had the lowest index scores. Among all the production, 96% of the production of style stratification followed the predictable order of style shifting. It implied that there was a systematic linguistic behavior in the English production of /z/ by Japanese L2 speakers of English.

Speech style was found to be a significant factor for linguistic variation in previous studies (Bayley, 1996; Dickerson, 1975; Labov, 2006), but Beebe (1980), Lin (2001), and Sato (1985) suggested that speech style alone might not have any effect on more target-like production of L2 speakers. Beebe (1980) investigated initial and final English /r/ produced by nine native speakers of Bangkok Thai, who were from the low social class to the upper social class living in New York. The data were collected from conversation, passage reading, word-list reading, and a perception test. However, only the data in conversation and word-list reading were presented because it was expected that style-shifting from these two styles might lead to a large contrast in result. The findings of the initial /r/ and final /r/ were not consistent as the final /r/ was more accurately produced and closer to the target form in word-list reading than in conversation while the initial /r/ was pronounced more correctly in conversation than in word lists. Beebe explained that the sociolinguistic variation in Thai possibly influenced the English production of initial /r/ as initial /r/ in Thai had "a highly conscious, learned social meaning" (p. 442). As for the English final /r/, it was hardly influenced due to the absence of social value attached to the Thai final /r/. It should be noted that speech style might not be the sole factor affecting L2 production because linguistic environment or other social factors might also play a role in linguistic variation. The findings contradicted to the studies by Bayley (1996) and Dickerson (1975) that more target-like variants were produced more in formal task since the English initial /r/ was more native-like while final /r/ was more target-like in formal contexts. Beebe concluded that speakers' attention to L2 speech was likely to be influenced when social value was attached to the native language phonology of L2 speakers; hence, speech style may not have any effect on linguistic variation.

Similar to Beebe's (1980) study which showed that speech style might not be significant for linguistic variation, Sato (1985) and Lin (2001) found that formal contexts might not elicit more target-like pronunciation. Sato examined English production of word-final consonants as well as consonant clusters of a Vietnamese speaker aged 12 years old living in the United States. The data were obtained from free conversation, oral reading task, text recitation, together with imitation of words and short phrases over 10 months. The results showed an inconsistency as the production of word-final consonants were more target-like in conversation than in reading tasks while there were more target-like productions of word-final consonant clusters in text recitation than in conversation. Sato suggested that more attention was not only paid to language form, but also to "other demands on real-time discourse production: recall and encoding of rhetorical structure, lexical items, clause sequencing, etc." (p. 195). Mastering English production may also be due to other factors which are crucial for L2 speakers of English, instead of solely the attention paid to different speech styles. Regarding another study of the effect of speech style on the production of consonant clusters, Lin (2001) explored the English consonant clusters in onset position produced by 20 native Chinese speakers. The data were elicited from reading minimal pairs with phonetic transcription, word-list reading, sentence reading, and conversation. Similar to Sato, the results of the study did not conform to the prediction that more target-like production was elicited in formal tasks because no significant difference was found in the four speech styles.

Since the current study also explores English phonological variables in different speech styles produced by Cantonese L2 speakers of English, previous studies (Bayley, 1996; Beebe, 1980; Dickerson, 1975; Labov, 1972, 2006; Lin, 2001; Sato, 1985) about speech style and attention may possibly help explain the results of the present study. Therefore, it is important to understand how speech style and attention play a role in L2 speakers' production.

2.3.5 Language Use and Linguistic Variation

Early research has investigated the effect of the extent of oral English use on English pronunciation of L2 speakers of English (Flege & Fletcher, 1992; Purcell & Suter, 1980; Suter, 1976; Thompson, 1991).

Suter (1976) examined the English pronunciation of 61 nonnative English speakers, including Arabic, Japanese, Persian, and Thai speakers. Among 20 variables, four variables were related to oral English use and they were amount of conversation at home in English with native speakers of English, amount of conversation at work and at school in English with native speakers of English, number of years the speaker had lived in English-speaking countries, and duration of residence with native speakers of English (Suter, 1976, p.234). All of these four variables were found to be significant predictors and were positively correlated with accurate English pronunciation of the L2 speakers. The results implied that the more a speaker spoke English with native English speakers at home, at work, and at school, the more accurate his or her pronunciation tended to be. Also, a longer duration of a speaker living in English-speaking countries or living with native English speakers possibly led to more accurate pronunciation. Besides the oral English exposure outside classrooms, four variables about formal teaching and training in English along with English pronunciation were taken into account. Only total amount of formal classroom training in English and amount of intensive formal classroom training in English were significant for accurate pronunciation while amount of formal classroom training addressed specially to English pronunciation and amount of formal training in English carried out by a native English teacher were not found to be significant. Although more intensive classroom training was more likely to lead to more accurate English pronunciation, more total formal classroom training might cause English pronunciation to be less accurate. Suter pointed out that the quality instead of the amount of formal training in English pronunciation should be measured if possible so that a significant relationship was more likely to be found. The findings, in fact, demonstrated informal exposure to oral English use could be more crucial than formal classroom instruction and training. L2 speakers who have more opportunities to be engaged in authentic conversation in an English-speaking environment are more likely to have better English pronunciation than those who only acquire English in formal classroom teaching.

The reexamination of Suter's (1976) study by Purcell and Suter (1980) found that only four predictors among all the 20 predictors were the most statistically significant for English pronunciation and they were the L1 of the participants, aptitude for oral mimicry, residency (duration staying in an English-speaking country and with native English speakers), and strength of concern for accurate pronunciation. Regarding oral English use, length of residence in the United States and duration of residing with native English speakers were major factors influencing English pronunciation but amount of spoken English used at home, at work or at school, that were found to be significant in Suter's study, were not significant for English pronunciation in the reexamination study. Yet, Purcell and Suter explained that indeed amount of spoken English used was not individually significant for accurate English pronunciation but was correlated with length of residence (the duration of staying in a country) and L1 background of the speakers, which were the most significant predictors for pronunciation accuracy. They added that L2 speakers who had stayed in an English-speaking country for a certain period of time and resided with native English speakers for most of the time were more concerned about their accuracy of English pronunciation. Again, this study demonstrated that the exposure to oral English outside classroom instead of formal classroom teaching was important for accurate English pronunciation of L2 speakers of English. The exposure to oral English in informal settings may also have an influence on other factors, such as awareness of English pronunciation and attitude toward English, which are likely to have a positive effect on English pronunciation.

Flege and Fletcher (1992) conducted a research with four experiments on listener-related and talker-related factors which might have an influence on the degree of perceived foreign accent. One experiment focused on the analysis of the effect of age of L2 learning (AOL), age of arrival in the United States, length of residence in the United States, amount of daily English use, formal education in English, gender, age, and so on, on foreign accent of Spanish speakers. A total of 30 Spanish speakers were categorized into three groups, including early L2 learners, experienced late L2 learners, and inexperienced late L2 learners, with 10 participants in each group. A correlation was found between the degree of accent with formal English-language instruction, age of arrival, and length of residence in the United State while percentage daily use of English, gender, and age were not found to be correlated. The results indicated that more formal English instruction, earlier arrival in the United States, and longer duration of residence in the United States possibly led to more native-like English pronunciation of the Spanish speakers.

Similar to the study by Suter and Purcell (1980), Flege and Fletcher found that amount of daily English language use was not significant while residence in an English-speaking country was a significant factor for English pronunciation of L2 speakers. It was interesting to find out that immersing in an English-speaking environment helped L2 speakers improve the English pronunciation of L2 speakers while it was hard to conclude whether amount of oral English use played a critical role in affecting L2 speakers' English pronunciation. Thompson (1991) also studied the English pronunciation of L2 speakers who were Russian immigrants in the United States. Although Thompson reported that English pronunciation by native Russian speakers and their English use were correlated, L2 use was not shown to be significant in further analysis for influencing Russian speakers' pronunciation of English. Similar to the study by Purcell and Suter (1980), use of English was found to be correlated with another significant factor which was age at arrival. The reason for it was that the younger the age at arrival of a L2 speaker in the United States, the more likely the speaker was to receive more education in English and to speak English socially and at home, for example, "marrying an English speakers, having English-speaking children, and socializing with English-speaking friends" (Purcell & Suter, 1980, p. 193) . The above studies reveal that oral English language use may not be the most influential factors for the English pronunciation of

L2 speakers; yet, a conclusion is hard to be made as other factors related to language use may also play a role.

The above results show that it is difficult to draw a conclusion whether the use of English is greatly significant for the English pronunciation of L2 speakers but studies in French of FSL learners (Dewaele, 2004; Mougeon & Rehner; 2001; Mougeon et al., 2003; Rehner & Mougeon, 1999) showed that the frequency of French language use and the contact with the target language played an important role in L2 variation. The study of Rehner and Mougeon (1999) investigated the linguistic variation in spoken French of the students in French immersion programs in Montreal and it focused on the negative constructions with or without the use of the French negative particle *ne*. The use of *ne* is the marker of a formal style while the deletion of *ne* is the vernacular form. It was found that the exposure of spoken French in informal settings was influential to deletion of negative particle *ne* in which deletion increased when students had an increased amount of French use or exposure out of the classroom, via the extended duration of staying with francophone families, exposure to French media, and amount of French schooling. In general, the more the exposure to extracurricular spoken French, the more the deletion of *ne* was produced. Still, the time in francophone environment did not demonstrate a consistent pattern, and Rehner and Mougeon explained that the time spent in a francophone environment did not necessarily lead to meaningful interactions with the francophones. A student stated that she did not have a lot of opportunities to speak French in class and with the francophone family because students did not necessarily speak French in class and she also felt nervous to speak French with her family that she finally spoke in English. Hence, immersing in an L2 environment possibly leads to linguistic variation if there is sufficient meaningful interaction with the native speakers of that language. Similar to Rehner and Mougeon, Dewaele (2004) also found that the higher the frequency of French use, the higher the rate of *ne* deletion. Another study by Mougeon et al. (2003), which examined the use of the formal variant of pronoun *nous*, meaning 'we' in English, and the less formal variant *on*, showed the same result as the study of Rehner and Mougeon. The finding confirmed the hypothesis that extracurricular French exposure had a positive effect on the frequency of the mildly marker variant *on*.

Even though there is a lack of strong evidence of the effect of L2 use on L2 pronunciation, studies (Dewaele, 2004; Mougeon & Rehner; 2001; Mougeon et al., 2003; Rehner & Mougeon, 1999) have reported that the use of L2 is significant for L2 production. Unlike the above studies which were conducted in the country where the target language is used, English is not the primary language spoken in Hong Kong, but still there are abundant opportunities to be exposed to English language. As the background and language experience of Cantonese speakers in Hong Kong may influence the frequency of their oral English use, which may be a significant factor for English pronunciation or phonological variation, it is worthwhile to investigate this factor in the Hong Kong context.

2.4 Linguistic Factors and Linguistic Variation

Linguistic factors include preceding and following linguistic environment, voicing agreement, grammatical category and so forth. Studies about the effect of linguistic environment on the English pronunciation of Cantonese and Mandarin speakers (Bayley, 1996; Chan, 2006a; Hung, 2000; Peng and Setter, 2000; Young, 1988) found that linguistic environment was significant for L2 linguistic variation.

Bayley (1996), Chan (2006a), Hung (2000), Peng and Setter (2000), and Young (1988) studied the effect of linguistic environment on the English pronunciation of Mandarin and Cantonese speakers of English. Bayley (1996) examined whether linguistic and social constraints had an effect on /t, d/ deletion and on the pattern of affixation in the English interlanguage of Mandarin ESL learners. Six linguistic factors, including grammatical status, preceding segment (sibilant, nasal, stop, nonsibilant fricative, and liquid), following segment (obstruent, liquid, glide, vowel, and pause), voicing agreement with the preceding segment, syllable stress, and cluster length, were examined. The data were collected from passage reading, interviews, and conversations about the past events. The production of native English speakers was compared with that of Mandarin L2 speakers of English. In general, /t, d/ deletion occurred more frequently in inflectional than lexical /t, d/ clusters. Regarding phonological environment, the effect of a preceding and a following segment, as well as voicing agreement with the preceding segment on /t, d/ deletion were similar in the data of Mandarin speakers and native English speakers. Deletion happened more frequently with a preceding obstruent or a nasal than with a liquid. Besides the preceding environment, the following environment was crucial for /t, d/ deletion. A following obstruent and a liquid were the most influential in /t, d/ deletion, followed by a glide and a vowel. The findings showed that most of the following segments favored deletion, but the effect of a following pause was found to be varied.

Young (1988) investigated English *–s* plural marking produced by native Mandarin speakers and found that linguistic environment was one of the significant factors for the variation in plural marking. Although both preceding and the following linguistic environment had a significant effect on *–s* plural marking, a preceding phonological segment was more significant than a following segment. Among various preceding linguistic environments, a preceding vowel, a nonsibilant fricative, and a stop favored –*s* plural marking while a preceding sibilant, nasal, and lateral inhibited it.

In Chan's (2006a) study about the production of English final consonants by Cantonese L2 learners of English, the modifications of the lateral /l/ and the nasals /m n ŋ/ were explained based on their linguistic environment. The lateral /l/ in coda position, dark [ɫ], had the least accuracy rate when there was a preceding round back vowel, for example, /u:/ in *cool* and /ɔ:/ in *tall*, or a diphthong with the second vowel that was a round back vowel, for example, /əʊ/ in *whole*. However, a preceding close front vowel, for instance, /ɪ/ in *kill*, had the highest accuracy rate of final /l/ production. With a preceding round back vowel, deletion of final /l/ occurred whereas vocalization, that is a substitution by [u], was found with a preceding close front vowel. Chan explained that dark [ɫ] involved "a secondary articulation of the raising of the back of the tongue concurrently with the primary articulation of the tip of the tongue touching the alveolar ridge and air escaping through the sides of the tongue" (p. 305). As both the final /l/ and round back vowels required the raising of the back of the tongue, they were likely to be regarded as equivalent by the participants who produced them as if a single sound, and thus it led to the omission of the final /l/. Since the articulation of a preceding close front vowel involves the front part of the tongue and the dark [ɫ] involves the back part of the tongue, such dissimilarity may lead to a more careful articulation of consonants; hence, there were more accurate production of final /l/ with a preceding close front vowel. Yet, the secondary articulation in the dark [ɫ] is likely to be perceived as the equivalence of the round back vowel [u] which widely replaces the dark [ɫ]. For the nasals, preceding vowels may play a role in the English production. The findings revealed that a preceding central vowel /ɜ:/, a preceding diphthong, such as /ɔɪ/ and /aɪ/, and a preceding front vowel like /æ/ led to the lowest accuracy on the final /m/, /n/, and /ŋ/, respectively. The deletion of /n/ after a diphthong in coda position could be attributed to Cantonese influence. As explained by Chan (2006a), diphthongs do not precede /m, n, ŋ/ in Cantonese so Cantonese speakers of English are likely to delete the nasals and pronounce the word as an open syllable if they encounter English words with a preceding diphthong and a final nasal, for instance, *line* [laɪn] is pronounced as [laɪ].

As mentioned in Section 2.2.2, Hung (2000) suggested "nasal harmony" was likely to cause free variation of /n/ and /l/ in onset position in the English pronunciation of Cantonese speakers. Based on the result in the study, Hung explained that the likelihood of a replacement of initial /l/ by /n/ raised when another nasal sound appeared within the same syllable. On the other hand, initial /n/ was less likely to be produced as /l/ with the existence of a nasal in the syllable.

Peng and Setter (2000) examined English consonant clusters produced by two Cantonese speakers in suffixes. Consonant cluster simplification frequently happened in the production of the participants. The alveolar stops /t/ and /d/ were found to be retained in the vowel-initial suffix, which is *-ing*, regardless of the preceding sound was a consonant or a vowel. In the consonant-initial suffixes, such as *-s*, *-ful*, and *-ment*, various patterns of deletion occurred. /t, d/ were deleted in the words with the English plural or third-person singular suffix *-s*. For the tokens with the *-ful* suffix, /t, d/ were deleted only if there was a preceding consonant. They were retained if they were preceded by a vowel. Both the suffixes *-ful*, and *-ment* were not significant for the deletion of /t, d/, which were commonly deleted with the existence of a preceding consonant. This study showed that preceding linguistic environment was more influential than following linguistic environment because the suffixes alone could not lead to the deletion of /t, d/.

The findings of the studies on the English phonological variation of Cantonese speakers (Bolton & Kwok, 1990; Chan, 2006a; Chan, 2007; Chan & Li, 2000; Deterding et al., 2008; Eckman, 1981; Edge, 1991; Hung, 2000; Peng & Setter, 2000) seem to show systematic patterns of the English pronunciation of Cantonese L2 speakers of English. The most common features found in the English pronunciation of Cantonese speakers are devoicing of voiced fricatives, substitution of dental fricatives, /n/ and /l/ variation, vocalization of /l/, and simplification of consonant clusters. Therefore, the current study investigates whether these features frequently appear in the English pronunciation of Cantonese L2 speakers of English and the reasons for their production.

Linguistic factors are the internal factors which influence speakers' pronunciation; however, linguistic factors alone are insufficient to explain the English pronunciation of Cantonese speakers. Hence, extralinguistic factors, which are external factors, are vital to elaborate Cantonese speakers' production of the target English consonants.

2.5 Summary of the Reviews

The section has provided a review of linguistic variation caused by extralinguistic and linguistic factors. The review of demographic factors, including social class, age, and gender, sheds a light on the current study because demographic factors has rarely been taken into account in the English pronunciation of Cantonese speakers. Since demographic factors solely may not be able to generate a comprehensive picture of linguistic variation, other extralinguistic factors, such as speech style and frequency of oral English language use, along with demographic factors will be able to explain the possible English phonological variation of

Cantonese speakers from diverse backgrounds. Moreover, the studies of Hong Kong English (Bolton & Kwok, 1990; Chan, 2006a; Chan, 2006b; Chan, 2007; Chan & Li, 2000; Deterding et al., 2008; Eckman, 1981; Edge, 1991; Hung, 2000; Peng & Setter, 2000) showed systematic patterns of the English production of Cantonese speakers, and it has to be further investigated to determine whether the common features are frequently produced by Cantonese speakers and whether the linguistic environment would have a constraint on their English pronunciation.

2.6 Pilot Study

As introduced in the literature review, the extralinguistic and linguistic factors may have an effect on linguistic and phonological variation. Prior to the main study, a pilot study was carried out so as to examine the effect of various factors on the three types of production, including accurate production, feature change, and deletion, of Cantonese speakers as well as to refine the research questions and methodology framework in the main study.

In the pilot study, there were six extralinguistic factors, including gender, social class, frequency of oral English language use, speech style, educational background of studying in an English-Medium or Chinese-Medium secondary school, social identity consisting of Hongkonger, Hong Kong Chinese, Chinese, and

Mainland Chinese, along with two linguistic factors, including linguistic environment and syllable/word position. Apart from the extralinguistic factors presented in the review, the educational background of Cantonese speakers studying in English-Medium of instruction (EMI) or Chinese-Medium of instruction (CMI) secondary schools and social identity were considered. Age was excluded because only the participants in the age group of 20-30 were investigated in the pilot study. Since the time which Cantonese speakers in Hong Kong acquire English from formal teaching is normally the most in secondary school and learners are possibly reaching a higher level of proficiency in spoken English than in primary school, the language experience at that time may be crucial for speakers' English pronunciation. According to Brewer (1991), social identity is "hypothesized to be strongest for those self-categorizations that simultaneously provide for a sense of belonging and a sense of distinctiveness" (p. 475) and they are categorizations of the self-definition into more inclusive social units that depersonalize the individuated self-concept. Social identities are chosen and "selected for the various bases for self-categorization available to an individual at a particular time" (Brewer, 1991, p. 477). The social identity of being a Hongkonger, Hong Kong Chinese, Chinese, or Mainland Chinese is self-identified and is analyzed in relation to participants' language attitude towards English with a Hong Kong accent in addition to their English pronunciation in ord to find out whether their English pronunciation would be affected by how the speakers view themselves based on their self-identified social identity.

2.6.1 Research Questions and Research Design

In order to examine the English phonological variation of Cantonese speakers from the sociolinguistic perspective and the factors which may be significant for the English pronunciation, the following research questions were proposed:

1. How do extralinguistic factors, for example, social class, gender, and speech style play a role in phonological variation?
2. To what extent does the education background of Cantonese speakers' studying in English-Medium and Chinese-Medium school have an effect on phonological variation in English?
3. How is social identity related to English pronunciation?
4. How significant is frequency of oral English use at home, at work, and with friends for the English pronunciation of Cantonese speakers?
5. Are linguistic environment (preceding front vowel, preceding back vowel, preceding diphthong, following front vowel, following back vowel, and following diphthong) and syllable/word position of an English consonant significant for speakers' English pronunciation?

A total of 16 participants (see Table 2.1) with an equal number of men and women participated in the study. Since it was a preliminary study, only participants from the age group of 20-30, among the three age groups 20-30, 31-45, and 46-60, were examined. Therefore, age was not taken into account in the pilot study. Among all participants, two participants are from the upper middle class and 14 are from the lower middle class. Moreover, 13 participants studied in EMI secondary schools while three participants studied in CMI secondary schools. The pilot study focused on 15 variants, that are seven singleton consonants, /f, v, θ, ð, r, n, l/ and eight consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/. Data were collected from a word list, two reading passages, answers to a passage chosen by participants, and an interview. All materials were designed by the researcher based on the target consonants with particular linguistic environments, comprising a preceding front vowel, a preceding back vowel, a preceding diphthong, a following front vowel, a following back vowel, and a following diphthong, syllable-onset and syllable-coda position for monosyllabic words, as well as word-initial and word-final position for disyllabic words. Apart from the reading tasks and an interview, participants were asked to fill in a questionnaire regarding their personal information, educational background, everyday oral language use, social identity, and language attitude towards various English varieties. The methodology of the main study will be presented in Chapter 3 in detail.

Table 2.1

Demographical Distribution of Participants in the Pilot Study

Age	20 30 (16 participants)			
Social Class	Upper-middle (2)		Lower-middle (14)	
Gender	Women (4)	Men (4)	Women (4)	Men (4)
Educational Background	EMI (13)		CMI (3)	

Data were coded for the following categories, 1) accurate production; 2) feature change; and 3) deletion. The factor groups were coded as: a) gender (women and men); b) social class (the lower middle and the upper middle class); c) educational background (English-Medium and Chinese-Medium schools); d) social identity (Hongkonger, Hong Kong Chinese, Chinese, and Mainland Chinese); e) frequency of oral English language use (infrequent, intermediate, and frequent use); f) speech style (word list, passage reading, and conversation); g) linguistic environment (preceding front vowel, preceding back vowel, preceding diphthong, following front vowel, following back vowel, and following diphthong); and h) syllable/word position (syllable-onset and syllable-coda position in monosyllabic words, as well as word-initial, word-medial, and word-final position in disyllabic words). The statistical data were generated through the variable rule analysis (VARBRUL) which is a loglinear regression program. In significant factors, the higher the VARBRUL weight of a sub-factor indicates the more the favorable effect of it on the type of production over another sub-factor (see Section 3.2.4 for details).

2.6.2 Results of the VARBRUL Statistics

The VARBRUL statistical results (see Table 2.2) instead of the descriptive statistics will be presented to demonstrate the effect of the significant factors for different types of production. Generally, 16 participants produced 7393 tokens in the word list, the passage-reading, and conversations. In the production of the consonants, 83.8%, that is 6196 tokens, were produced accurately while 11.7%, that is 868 tokens, of the consonants underwent feature change, which means a consonant is replaced by another consonant, for example, the voiceless dental fricative /θ/ is pronounced as /f/. Only 4.5% of consonants, that is 329 tokens, were deleted.

Table 2.2

VARBRUL Statistical Results of Three Types of Production in the Pilot Study

Factor Group	Accurate Production	Feature Change	Deletion
Total			
N = 7393	**Number (n) = 6196**	**n = 868**	**n = 329**
%	**83.8**	**11.7**	**4.5**
Input Probability	**.882**	**.038**	**.016**
1.Gender			
Women			
p^i	.688n.s.*	.357	.385n.s.
#	3145	396	187
%	50.8	45.6	56.8
Men			
p^i	.309n.s.	.645	.617n.s.
#	3051	472	142
%	49.2	54.4	43.2
Range	.379	.288	.232
2. Social Class			
Lower middle			
p^i	.442	.562	.572
#	5326	853	326
%	86	98.3	99.1
Upper middle			
p^i	.847	.140	.107
#	870	15	3
%	14	1.7	0.9
Range	.405	.422	.465
3. Educational Background			
EMI			
p^i	.595n.s.	.452	.431n.s.
#	5174	633	234
%	83.5	72.9	71.1
CMI			
p^i	.153n.s.	.703	.774n.s.
#	1022	235	95
%	16.5	27.1	28.9
Range	.442	.251	.343

Factor Group	Accurate Production	Feature Change	Deletion
Total			
N = 7393	**Number (n) = 6196**	**n = 868**	**n = 329**
%	**83.8**	**11.7**	**4.5**
Input Probability	**.882**	**.038**	**.016**
4. Social Identity			
Hongkonger			
p^i	.617n.s.	.364n.s.	.474n.s.
#	1962	232	114
%	31.7	26.7	34.7
Hong Kong Chinese			
p^i	.477n.s.	.539n.s.	.474n.s.
#	3116	467	147
%	50.3	53.8	46.1
Chinese			
p^i	.365n.s.	.626n.s.	.615n.s.
#	1118	169	68
%	18	19.5	19.2
Range	.252	.262	.141
5. Frequency of Oral English Language Use			
Frequent			
p^i	.858	.127	.130
#	897	14	4
%	14.5	1.6	1.2
Intermediate			
p^i	.447	.568**	.567**
#	1794	225	104
%	29	25.9	31.6
Infrequent			
p^i	.432	.568**	.567**
#	3505	629	221
%	56.5	72.5	67.2
Range	.426	.441	.437

Factor Group	Accurate Production	Feature Change	Deletion
Total			
N = 7393	**Number (n) = 6196**	**n = 868**	**n = 329**
%	**83.8**	**11.7**	**4.5**
Input Probability	**.882**	**.038**	**.016**
6. Speech Style			
Word list			
p^i	.500n.s.	.534n.s.	.455**
#	2143	328	87
%	34.6	37.8	26.4
Passage-reading			
p^i	.497n.s.	.514n.s.	.455**
#	2428	364	135
%	39.2	41.9	41
Conversational data			
p^i	.505n.s.	.433n.s.	.627
#	1625	176	107
%	26.2	20.3	32.6
Range	.008	.101	.172

Factor Group	Accurate Production	Feature Change	Deletion
Total			
N = 7393	**Number (n) = 6196**	**n = 868**	**n = 329**
%	**83.8**	**11.7**	**4.5**
Input Probability	**.882**	**.038**	**.016**
7. Linguistic Environment			
Effect of a preceding vowel on coda			
Front			
p^i	.513**	.545**	.435**
#	888	149	114
%	14.3	17.2	34.7
Back			
p^i	.363**	.545**	.435**
#	351	127	93
%	5.7	14.6	28.3
Diphthong			
p^i	.363**	.545**	.435**
#	42	14	11
%	0.7	1.6	3.3
Effect of a following vowel on onset			
Front			
p^i	.513**	.545**	.435**
#	2762	374	36
%	44.6	43.1	10.9
Back			
p^i	.513**	.333	.732
#	1360	101	58
%	21.9	11.6	17.6
Diphthong			
p^i	.513**	.545**	.435**
#	793	103	17
%	12.8	11.9	5.2
Range	.150	.212	.297

Factor Group	Accurate Production	Feature Change	Deletion
Total			
N = 7393	**Number (n) = 6196**	**n = 868**	**n = 329**
%	**83.8**	**11.7**	**4.5**
Input Probability	**.882**	**.038**	**.016**
8. Syllable/Word Position			
Syllable-onset (monosyllabic word)			
p^i	.550**	.551**	.377**
#	2485	318	60
%	40.1	36.6	18.2
Syllable-coda (monosyllabic word)			
p^i	.265	.551**	.927
#	782	219	217
%	12.6	25.2	66
Word-initial (disyllabic word)			
p^i	.550**	.437**	.377**
#	1391	151	33
%	22.4	17.4	10
Word-medial (disyllabic word)			
p^i	.550**	.437**	.377**
#	1538	180	19
%	24.9	20.8	5.8
Range	.285	114	.550
Chi-square	18.477	34.417	28.306
df	5	6	5
Significance	p < .01	p < .001	p < .001

* n.s. = not significant

**these factors were collapsed into one factor because of similar input probabilities in earlier runs

2.6.2.1 Results of Accurate Production

Among the eight factor groups, four groups, which are social class, frequency of oral English language use, linguistic environment, and syllable/word position, were found to be significant for accurate production (X^2 = 18.447, 5 df, $p < .01$). These four factor groups were the only groups which had a significant effect on all three types of production, including accurate production, feature change, and deletion.

In terms of social class, it had a moderately strong effect, with the range of .405, on accurate production and the upper-middle class (p' .847) promoted accurate production over the lower-middle class (p' .442). This result implies that participants from the upper middle class articulated the target consonants more accurately than those from the lower middle class. Apart from social class, frequency of oral English language use was another extralinguistic factor which was significant for accurate production. Frequent use (p' .858) had a more favorable effect on accurate production than intermediate use (p' .447) and infrequent use (p' .432). The effect was fairly strong with the range of .426.

Linguistic environment consisted of the effect of a preceding vowel on coda position and the effect of a following vowel on onset position. The effect of a preceding front vowel and all types of a following vowel (p' .513) favored accurate production over the effect of a preceding back vowel and a preceding diphthong (p^i .363); however, the effect of linguistic environment was weak (range .150). In the finding of syllable/word position, three subgroups (p^i .550), including syllable-onset position in monosyllabic words, word-initial and word-medial position in disyllabic words, favored accurate production over syllable-coda position in monosyllabic words (p^i .265). Although the effect was not very strong (range .285), the effect of syllable/word position was relatively stronger than that of linguistic environment.

On the contrary, four extralinguistic factors were insignificant for accurate production. Social identity was not found to be significant for all types of production. Gender and educational background were not significant for accurate production and deletion but were significant for feature change. Besides, speech style was not found to be significant for accurate production and feature change but significant for deletion.

2.6.2.2 Results of Feature Change

In feature change, six factor groups, gender, social class, educational background, frequency of oral English language use, linguistic environment, and syllable/word position, were found to be significant. Compared to accurate production and deletion, feature change had the most significant factor groups (X^2 =

34.417, 6 df, $p < .001$).

Although gender was not significant for accurate production and deletion, it had a significant effect on feature change. Men (p^{i} .645) had a more favorable effect than women (p^{i} .357) on feature change; still, gender did not have a very strong effect on it (range .288). For social class, the upper-middle class promoted accurate production over the lower-middle class, and thus it is not surprising that the lower-middle class favored deletion (p^{i} .562) over the upper-middle class (p^{i} .140). Educational background was found to be insignificant in accurate production and deletion but it was statistically significant for feature change. CMI (p^{i} .703) favored feature change over EMI (p^{i} .452) although educational background did not have a strong effect (range .251). The result shows that participants from CMI schools were likely to modify the target consonants while those from EMI schools were less likely to make these changes. The effect of frequency of oral English language use was strong (range .441). Intermediate and infrequent use (p^{i} .568) had a favorable effect on feature change over frequent use of English (p^{i} .127).

In linguistic environment, the effect of other five types of vowels (p^{i} .545) favored feature change over the effect of a following back vowel (p^{i} .333); yet, the effect of linguistic environment was not strong, with the range of .212. For syllable/word position, the effect on feature change was the weakest (range .114) among all the significant factor groups in feature change. Syllable-onset and syllable-coda position (p' .551) promoted feature change over word-initial and word-medial position (p' .437). Interestingly, the effect of this factor group on feature change was the weakest while its effect on deletion was the strongest among the significant factor groups in deletion. Six factor groups had a significant effect on feature change while speech style and social identity were not found to be significant for this type of production.

2.6.2.3 Results of Deletion

Deletion had the lowest amount of production among the three types of production as only 4.5%, that is 329 tokens, of the target consonants were deleted. Yet, more factor groups were found to have a significant effect on deletion (X^2 = 28.306, 5 df, $p < .001$) than on accurate production. Besides social class, frequency of oral English language use, linguistic environment, and syllable/word position, which were all significant for accurate production, speech style were found to be significant for deletion as well.

The effect of the lower middle class and the upper middle class on deletion (range .465) was comparable to that of accurate production (range .405) and feature change (range .422) as the ranges in all types of production were similar. Similar to the results in feature change, the lower middle class (p' .572) promoted feature change over the upper middle class (p' .107). Yet, it should be noted that the number of tokens in deletion and feature change produced by the two upper middle class participants were small, and thus the finding of the effect of social class on these two types of production may not be highly reliable. In general, participants from the upper middle class rarely deleted or modified the target consonants. As social class was one of the two extralinguistic factor groups which had a significant effect on all types of production, this factor was comparably more important than other extralinguistic factors which were not significant for all types of production. Similar to the result in feature change, intermediate and infrequent use of oral English (p' .567) had a more favorable effect on deletion over frequent use of oral English (p' .130). Since the number of tokens in deletion and feature change produced in frequent use was small, the findings generated from this factor group may not be as representative as the findings of other factor groups. The degree of the effect of frequency of oral English language use on deletion (range .437) was comparable to that of accurate production (range .426) and feature change (range .441). This result corresponds to the result of social class that the ranges in all types of production were around .400, which indicates there is a relatively strong effect of social class and frequency of oral English language use on all the three types of English production. The findings of the three types of production show that frequency of oral English language use plays an important role in the English pronunciation of Cantonese speakers. Speech style was only found to be significant for deletion. Conversation (p^i .627) favored deletion over word list and passage-reading (p^i .455), which implies deletion happened more in conversation than in other two speech styles. However, speech style had a fairly weak effect on deletion with the range of .172. Not only was speech style found to be statistically insignificant in accurate production and deletion, the ranges of this factor group in these two types of production were .008 and .172 respectively. Considering the ranges in all types of production, it can be concluded that speech style had a fairly weak effect on the English consonant production of Cantonese speakers.

In terms of linguistic environment, the effect of a following back vowel (p^i .732) promoted deletion over the effect of other five types of vowels (p^i .435), and this result is contrary to that of feature change. Although its effect on deletion was relatively weak (range .297), it was stronger than that of accurate production (range .150) and feature change (range .212). Regarding syllable/word position, syllable-coda position (p^i .927) had a more favorable effect on deletion over syllable-onset, word-initial, and word-medial position (p^i .377). The effect of syllable/word position was the strongest among all the factor groups which were found to be significant for deletion. Among the eight factor groups, gender, educational background, and social identity were not significant for deletion.

In general, social class, frequency of oral English language use, linguistic environment, and syllable/word position, were found to be significant for all the three types of production. Speech style was only significant for deletion while gender and educational background were significant for feature change. Social identity was the only factor group which was not found to have any significant effect on all types of production. The findings reveal that social class and frequency of oral English language use are more likely to have a stronger effect than other extralinguistic factors on the English pronunciation of Cantonese speakers because of their high level of ranges in accurate production, feature change, and deletion. In the main study, these two factors will be focused for further discussion. The effect of linguistic factors will be also presented with specific examples to illustrate the pronunciation difficulties that Cantonese speakers may encounter and how it may shed some light on pedagogical implications.

Although gender was not found to be significant for all the three types of English production, it is examined in the main study because gender still had a significant effect on feature change that further investigation into its effect on the English pronunciation of Cantonese speakers with more number of tokens is necessary. A more representative result may, hopefully, be generated from a greater number of tokens. Furthermore, gender has always been one of the major demographic factors studied in linguistic variation in the field of sociolinguistics, and the participants in the pilot study believed that women had better English pronunciation than men. Therefore, it is worthwhile to examine the effect of gender in the main study. As age was not included in the pilot study, it is still one of the extralinguistic factors examined in the main study so as to investigate its effect on the English pronunciation of Cantonese speakers. Similar to gender, speech style was only significant for deletion and its effect was generally weak in all the three types of production. In the main study, speech style was examined with more data and discussed in detail so as to display whether it has a significant effect on English pronunciation and the reasons for its effect. Yet, it is expected that speech style may not play an important role in English pronunciation because it was difficult to elicit a great amount of target English words in the conversational data which did not lead to a specific type of English production.

For participants' educational background of studying in a CMI or an EMI secondary school and social identity, these two factors were not found to be significant for any types of production and hence are eliminated in the main study. Based on the data from the interviews and the opinions from the participants, it is hard to strictly categorize whether the secondary school a participant has studied in before was a CMI or an EMI school because the educational policy has been changing over the years in Hong Kong. Some participants in the pilot study mentioned that the medium of instruction in class was Cantonese even though their school was labeled as an EMI school. Also, as a majority of participants have been working for a long period of time, the effect of this educational background on English pronunciation may be overridden by other extralinguistic factors. The educational level is not considered in the main study as well due to the similar qualifications obtained by the participants. All 16 participants in the pilot study received tertiary education mostly with a master and/or a bachelor degree and it would be difficult to distinguish participants' educational level which is regarded as a high educational level in the Hong Kong society. For participants in other age groups, it is very likely that most of them have obtained a higher academic qualifications after years of work since Cantonese speakers who are able to speak and communicate in English (not only for the conversational use) possibly are more well-educated. Still, educational background related to social class and frequency of English language use is taken into account in the main study for an in-depth discussion. For social identity, all participants are indeed Cantonese speakers of Chinese descent; the difference among various categories of social identity only depends on the participants how they identify themselves. Therefore, it is not surprising that this factor was not found to be significant for all types of production. Besides its insignificant effect on all types of production, all of the participants in the pilot study stated that there was no relationship between their social identity of being a Hongkonger, Hong Kong Chinese, Chinese, or Mainland Chinese and their English pronunciation. They suggested it should be their educational background, family background, and daily language experience, which are crucial for their English pronunciation. Thus, this kind of social identity is excluded in the main study.

Based on the findings of the pilot study, the research questions were revised in the main study.

2.7 Research Questions in the Main Study

The research questions in the pilot study were first set to examine the effect of various factors on English phonological variation or pronunciation of Cantonese L2 speakers of English. Instead of the general English pronunciation, the three types of production, including accurate production, feature change, and deletion, should be focused on. Research Questions 2 and 3 in the pilot study are excluded due to the insignificant effect of educational background of EMI and CMI schools, as well as social identity on all types of English production. In the pilot study, speech style was included in Research Question 1, which investigated the effect of extralinguistic factors, but it is taken as an individual factor in Research Question 3 in the main study because demographic factors, such as gender, age, and social class, are focused on in Research Question 1. Apart from speech style, frequency of oral English languages use is another extralinguistic factor being examined because it was found to have a strong significant effect for all the three types of production, and it seems to be related to social class and educational background of the Cantonese speakers. Hence, it is necessary to have a further investigation and discussion about the interrelationship of these factors.

Based on the findings in the pilot study and the reviews of extralinguistic and linguistic factors showing a lack of research of phonological variation in English pronunciation of Cantonese speakers from a sociolinguistic perspective, it is necessary to investigate the extralinguistic and linguistic factors which may be significant for the English pronunciation of Cantonese L2 speakers of English. Therefore, the following questions have been proposed:

1. What is the effect of demographic factors, including gender, age, and social class, on accurate production, feature change, and deletion?
2. What is the effect of frequency of oral English language use at home, at work, and with friends on accurate production, feature change, and deletion?

3. How do the participants perform in different speech styles? Is speech style significant for accurate production, feature change, and deletion?

4. Does linguistic environment (preceding front vowel, preceding back vowel, preceding diphthong, following front vowel, following back vowel, and following diphthong) and syllable/word position of a consonant affect accurate production, feature change, and deletion?

Chapter 3

Methodology

3.1 Introduction

In this chapter, the methodological framework of the study will be presented in detail. First, the information and background of the 47 participants will be provided. Next, there will be the presentation of the designed materials and the procedures of data collection and transcription. Lastly, the way of data coding and scoring, as well as the statistical program used for the data analysis, VARBRUL, will be introduced.

3.2 Research Methodology

3.2.1 Participants

As a sociolinguistic study of the English pronunciation of Cantonese speakers in Hong Kong, Cantonese speakers whose second language is English were chosen as participants. There were 47 Cantonese L2 speakers of English aged from 20 to 60 participating in the study. Cantonese is the mother tongue of all the participants as well as the primary language they use in daily life. Cantonese speakers whose first language is not Cantonese would not be considered in the present study. In Hong Kong, some Cantonese speakers migrated from Mainland China to Hong Kong or some were born and have grown up in other countries and returned to Hong Kong. Hence, Cantonese may not be their first language or primary language, and they may speak Cantonese with an accent. Having considered this situation, only Cantonese speakers whose first language as well as the primary language they use at home, with friends, and at work is Cantonese were invited to participate in the study. Even though some participants declared that Cantonese and English or/and Mandarin are their primary languages spoken at home, with friends or at work, Cantonese is still the primary everyday language they speak in general.

There was an attempt to control the criteria of participants, but social class and frequency of oral English language use of the participants were difficult to control. Therefore, the number of participants was not even in these two factor groups. The demographic information of the participants is shown in the chart below.

Table 3.1

Demographical Distribution of Participants in the Main Study

Age	20 - 30 (16 participants)				31 - 45 (16)				46 - 60 (15)			
Social Class	Upper-middle (UM) (4)		Lower-middle (LM) (12)		UM (6)		LM (10)		UM (11)		LM (4)	
Gender	Women (W) (4)	Men (M) (4)	W (4)	M (4)	W (4)	M (4)	W (4)	M (4)	W (4)	M (4)	W (4)	M (4)

3.2.1.1 Age of Participants

A total of 47 participants, including 23 men and 24 women, were invited to participate in the study. They were divided into three age groups, which were 20-30, 31-45, and 46-60. Details of each demographic distribution are as follows. The division of the three age groups is based on the statistics reported below. According to the statistics of Working Population by Occupation, Quinquennial Age Group and Sex in 2006 (HKCSD, 2007), the percentages of the working population being managers, administrators, and professionals ~~at the~~ age of 30-34, 35-39, and 40-44 were around 20% while those being associate professionals, clerks, service workers, and shop sales workers were 48-56%. For the working population at the age of 45-49, 50-54, and 55-59 being managers, administrators, and professionals were around 17% and those being associate professionals, clerks, service workers, and shop sales workers were from 29% to 40%. Since the percentages of the working population in different occupations and levels from the age of 30-34, 35-39, and 40-44 were similar and that of the age of 45-49, 50-54, and 55-59 were comparable, two age groups of 31-45 and 46-60 were formed. The percentages of the group of 20-24 and 25-29 were different from the other two groups because there were fewer youngsters falling in the professional field but a lot more in the semi-professional work. This division may help us understand the real situation in the society and the difference among these age groups.

3.2.1.2 Social Class of Participants

Apart from the three age groups, all participants were divided into the upper middle or the lower middle class based on their occupation, job position, and monthly income. The statistics of the Census and Statistics Department (HKCSD, 2007) showed that around 10% of the working population from the age of 20-29 were managers, administrators, and professionals, which could be classified as the upper-middle class. Compared to that of the age groups of 30-44 and 45-59, which had around 20% and 16% of the working population as managers, administrators, and professionals, people from the youngest age group were mainly from the lower-middle class.

Previous sociolinguistic studies (Kamata, 2006; Labov, 1963; Labov, 1966; Labov, 1972; Milroy & Milroy, 1978; Trudgill, 1974) have usually compared the linguistic variation between the working class and the middle class. English is the native language of the participants in those studies, and thus data could be easily accessible from native English speakers. However, the current research only focuses on the English pronunciation of Cantonese speakers from the upper middle and the lower middle class due to the difficulty in looking for Cantonese speakers of English from the working class and the upper class.

In Hong Kong, the working class, namely the blue-collar or unskilled workers, mainly involves labor work which possibly does not require knowledge in English but physical strength. It implies that working-class people are likely to possess a lower level of English education and lack the opportunity to be exposed to English at workplace. Although English is regarded as the second language in Hong Kong, not every Hong Kong citizen is a bilingual speaker or has the opportunity to master English. Especially for the middle-aged Cantonese speakers who immigrated to Hong Kong from Mainland China after adolescence, they may not receive any English education in the Mainland or Hong Kong. For some Cantonese speakers who were born and educated in Hong Kong, they may also acquire a limited amount of English if they lacked opportunities to receive education in English, and they are likely to receive a low-class job instead of a middle-class or upper-class occupation which requires a high level of language proficiency as well as educational background. The above situations indicate that Hong Kong people who are from the lower class would not be ideal participants in the current study as they possibly do not have any knowledge in English or they have low English proficiency. It would be interesting to examine the speakers from the upper class or high social class; however, they are the professionals or celebrities who have high economic or political power and they are not easily accessible for an academic research study which entails a lengthy data collection process.

Due to the constraints mentioned, the participants were primarily categorized into the upper middle class and the lower middle class in this present study. Hong Kong people who are managers, administrators, and professionals can be considered as the upper or upper middle class while those who are categorized as associate professionals can be considered as the lower-middle class. According to the categorization by HKCSD (2006), managers and administrators include directors, general managers, small managers, and so on, in sectors like industry, commerce, in addition to wholesale and retail trade. Professionals consist of qualified professional doctors, academic staff and administrators of university, accountants, lawyers, and so forth. Associate professionals comprise science technicians, principals and teachers of primary schools and kindergartens, law clerks, designers, and so on.

In the study, 26 participants were categorized as the lower middle class while 21 participants were categorized as the upper middle class. However, only four participants in the age group of 20-30 and six participants in the age group of 31-45 were considered as the upper middle class speakers. As explained previously, the proportion of the Hong Kong population at the youngest age group being managers, administrators, and professionals was low; the number of participants from the upper middle class would be limited. It was possibly because most of the employees at the age of 20 to 30 in Hong Kong have just graduated from college and have been working for only several years, they may not have built up a career and are still striving for the upper status.

3.2.1.3 Frequency of Oral English language use of Participants

Similar to social class, the number of participants with different levels of frequency of oral English language use was unequal because there was a constraint in controlling the participants with particular language experience. The categorization was based on the primary language the participants spoke in daily life and their self-evaluation. Consequently, the infrequent speakers of English were the largest group with 20 participants, followed by the intermediate users of oral English with 16 participants. Only 11 participants were considered as frequent users of oral English. The uneven numbers of the participants in different levels of frequency of oral English use was partially influenced by their occupation which may or may not require the participants to speak English.

3.2.2 Research Design

The present study aims to explore the English phonological variation of Cantonese L2 speakers of English from a sociolinguistic perspective, so all tasks were designed for the collection of spoken data along with the opinions of the participants. The research designs in the previous studies (Chan, 2006a; Chan, 2006b; Chan, 2007) about the English pronunciation of Cantonese speakers were taken as the reference for the research design of the present study. The major tasks consist of a word list, two reading passages, answer to a passage selected by the participants among the two reading passages, and an interview. Different tasks were designed for the study so as to investigate whether speech style is significant for the English pronunciation of Cantonese speakers. All materials were designed by the researcher based on the target consonants with particular linguistic environments and word positions which were focused on in the study. Apart from the reading tasks and an interview, participants were asked to fill in a questionnaire regarding their oral language use.

The present study focuses on 15 variants, including seven singleton consonants, /f, v, θ, ð, r, n, l/ and eight consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/, in which some have been found problematic for Cantonese L2 speakers of English. A total of 125 English words (see Appendix A) were chosen so that more tokens can be generated from the tasks for analysis. The chosen words are simple words, in terms of meaning, spelling, and pronunciation, so as to lower the chance of the words being unfamiliar to the participants that may affect their pronunciation. As this study examines the effect of two linguistic factors, which are linguistic environment and syllable/word position, the words chosen were based on the linguistic environments and word positions being investigated in the study. First, the effect of both preceding and following vowels on English pronunciation is examined. The linguistic environment consists of a preceding front vowel, a preceding back vowel, a preceding diphthong, a following front vowel, a following back vowel, and a following diphthong. All of the English front vowels /ɪ e æ i:/ and back vowels /ʊ ɒ u: ɔ: ɑ:/ are examined in the present study. Cantonese L2 speakers of English are reported to be unaware of the difference between the mid-front short vowel /e/ and the low-front short vowel /æ/ (Chan & Li, 2000); thus, they may fail to distinguish and pronounce these two similar vowels. If high and low vowels had been included in the study, the transcription of these vowels might have been influenced because /æ/ might be pronounced as /e/ in which a large amount of tokens with /e/ had to be excluded. In order to eliminate this possibility, front and back vowels, which have a greater difference in pronunciation, are investigated. For the choice of diphthongs, only /eɪ aɪ aʊ əʊ/ are highlighted because /ɔɪ/ has been found to be problematic for Cantonese speakers (Chan & Li, 2000) and may be articulated as the low back short vowel /ɒ/. Similar to the situation considered in high and low vowels, /ɔɪ/ is excluded in the present study. Other diphthongs with the schwa /ə/, such as /ɪə/, /eə/, and /ʊə/, are not included because it is difficult to expect whether the participants, who are from diverse backgrounds, speak with the British variety or the American variety, which does not consist of the diphthongs /ɪə/, /eə/, and /ʊə/. Regarding syllable/word position, English consonants in onset and coda position within monosyllabic words is explored. Variants in word-initial and word-medial position in disyllabic words, for example, /pr/ in *problem* and *surprise,* are also considered.

3.2.2.1 Word List and Passages

The word list consisted of 125 English monosyllabic and disyllabic words with the target consonants and linguistic environments. Two narrative passages (see

Appendix B), with the length of around 430 and 500 words respectively, were composed by the researcher based on the 125 words in the word list. The passages were composed in simple English so that the pronunciation or fluency of the participants would be less likely to be hindered by unfamiliar words. The use of two different passages instead of one passage was to ensure all the chosen words were included and to "sustain participants' interest and attention" (Chan, 2007, p. 238). Having two passages on different topics, all the target words could be included in the passages. With both the word list and the passages, abundant data of the target consonants could be elicited. The passages were not only designed for the collection of the passage-reading data, but also for the conversational data. Since it is difficult to elicit the target words in the interviews, participants were asked to select their favorite passage among the two passages and answer the questions about that passage so as to obtain more data of the target consonants. The questions about the passages were designed to elicit some of the target words. As a result, the conversational data comprised words with the target consonants from the answers to a passage and the interviews.

3.2.2.2 Questionnaire

Besides the tasks for the collection of the transcription data, a questionnaire (see Appendix C) regarding participants' demographic information, educational level and background, English-learning experience, oral language use, along with language attitudes was also designed to obtain more information for the detailed analysis from the sociolinguistic perspective on linguistic variation. In Part A of the questionnaire, the demographic information was obtained for the categorization of participants' gender, age, and social class. Part B and C consisted of the information about participants' educational level and background as well as English-language learning experience and oral language use, which helped to explain the effect of the demographic factors, in addition to frequency of oral English language use. Part D is about the language attitude of the participants and Questions 4 to 9 were asked in the interview to obtain the detailed explanation of the effect on English pronunciation from the participants. The opinions collected may function as the additional information for the discussion of the study.

3.2.2.3 Conversational Interview

Spontaneous speech is likely to elicit the spoken data which is similar to the speech in an authentic communicative situation (Chan, 2007), so each participant was interviewed individually for the collection of the relatively more natural and spontaneous data. An interview in English was conducted upon the completion of the questionnaire due to the importance of their immediate response after filling in the questionnaire. There were basically nine questions in the interview regarding participants' English pronunciation, their experience in learning English pronunciation, their views and opinions of the effect of gender, social status, family and educational background on the English pronunciation of Cantonese speakers. In addition, follow-up questions pinpointing their answers in the questionnaire were asked so as to generate a comprehensive response, regarding different aspects of the study, from the participants. All the monosyllabic and disyllabic words with the target consonants produced in the interview were taken into account for the conversational data because the data elicited from the answers to a passage were not sufficient.

3.2.3 Procedures of Data Collection

The whole process of data collection was around one hour to one and a half hour (see Table 3.2), which was contingent upon participants' individual time for preparation and reading. Before the start of data collection, the process of data collection, such as the duration of each task and the tasks they were going to complete, was explained to the participants without making them aware of the focus of the study. A consent form was also given to the participants to ensure their agreement of their participation in this study and their understanding that all their personal information will be kept confidential.

First, participants were given 10 minutes to glimpse the two passages and then they were required to read them aloud. Next, they were asked to choose their favorite passage and were given five minutes to prepare for the answers of the questions, which had to be responded verbally. Before answering to the questions of the passage, participants were allowed to jot down key words only to avoid them from reading the answers if they wrote in full sentences. After that, participants were asked to take a 5-minute break and then read the word list after the break. All the target words were randomly arranged so that the participants were not able to speculate on the focus of the study. After the completion of all reading tasks, participants were required to fill in the questionnaire, and questions were asked immediately after their response to certain questions. At last, an interview about their views towards English pronunciation was conducted in English for the purpose of obtaining more spoken data, and more importantly, to find out the potential reasons behind their English phonological variation. Each interview has lasted for around 15 to 20 minutes

Table 3.2

Procedures of Data Collection

Procedures	Tasks	Duration of each task
Step 1	Filling in the consent form	2 minutes (mins)
Step 2	Preparation for reading the two passages	5-10 mins
Step 3	Reading two passages	10-15 mins
Step 4	Preparation for answering questions to a passage	5-10 mins
Step 5	Answering questions to the passage	3-5 mins
Step 6	Short break	5 mins
Step 7	Reading the word list	3-5 mins
Step 8	Filling in the Questionnaire	10 mins
Step 9	Interview in English	15-20 mins

Apart from the reading materials for data collection, a digital recorder was used for audio recording the speech of participants. The Soundscriber, which was used for the transcription of digitized sound files, was an apparatus for data transcription in words.

3.2.4 Data Recording and Data Transcription

In a series of tasks, all the production tasks were recorded by a high-quality digital voice recorder (SAMSUNG YP-VX1ZB) with a noise reduction function to diminish the environmental noise for a clear recording. Based on the focus of the present study, only words with the 15 variants were transcribed in the phonological form. All the 125 words in the word list were transcribed because they consisted of all the target consonants. In the two passages, not all the words in the passages but only the 125 target words were transcribed. Since only a small amount of the target words were elicited in the conversational data, all the monosyllabic and disyllabic words with the target consonants and linguistic environments in the interviews were transcribed so as to generate a greater amount of conversational data for the analysis of speech style.

A total of 19666 tokens of the target consonants were transcribed and analyzed. The data were transcribed manually by the researcher twice. A transcriber who has received phonetic training and is experienced in transcription was invited to transcribe around 12% of the data, that is 2528 tokens, to check the inter-rater reliability. The inter-rater reliability is 89.2%. When there were discrepancies in the transcription of the researcher and the first transcriber, the researcher together with the second transcriber listened to the tokens again and made the final decision. When disagreements happened, the tokens were not taken into account in the analysis.

3.2.5 Data Coding, Data Scoring and Data Analysis

Data were coded for the following categories, 1) accurate production (seven singleton consonants /f, v, θ, ð, r, n, l/ and eight consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/); 2) feature change (the target variant is replaced by another sound); and 3) deletion (a target singleton consonant or a liquid in consonant cluster is deleted). The factor groups were coded as: a) gender (women and men); b) age group (20-30, 31-45, and 46-60); c) social class (the lower middle and the upper middle class); d) frequency of oral English language use (infrequent, intermediate, and frequent use); e) speech style (word list, passage reading, and conversation); f) linguistic environment (a preceding front vowel, a preceding back vowel, a preceding diphthong, a following front vowel, a following back vowel, and a following diphthong); and g) syllable/word position (syllable-onset and syllable-coda position in monosyllabic words, as well as word-initial, and word-medial position in disyllabic words).

The statistical data were generated through the variable rule analysis (VARBRUL) which is a loglinear regression program. The program is used to calculate the weight of various factors, including extralinguistic and linguistic factors, on the production of a particular variant. The VARBRUL is used to examine whether a factor group has statistical significance for different types of production. All factor groups were tested for the degree of favorable effect on each type of production. The VARBRUL analyses were run numerous times for each production type so as to obtain the best model fit of factor groups. After each run, factor groups which were found to be statistically insignificant by VARBRUL were eliminated from further VARBRUL analysis. The effect of a factor group is explained in a continuum that the higher the VARBRUL weight or input probability (p^i), the more the favorable effect of a subfactor over another subfactor on a particular type of production. After each run, several subfactors in the factor groups may have similar input probabilities and they may be collapsed into the same subfactor. It is not necessary to collapse the subfactors which have similar probabilities but they are occasionally collapsed as one factor so as to yield the best goodness-of-fit which is the most significant for a type of production.

After the presentation of the research methodology, the descriptive and VARBRUL statistical results and findings will be presented in the next chapter.

3.3 Summary

In the current study, there were 47 participants, including 23 men and 24 women, who are Cantonese L2 speakers of English aged from 20 to 60. They were divided into three age groups, which were 20-30, 31-45, and 46-60. The first two groups consisted of 18 participants and the last age group consisted of 17 participants. Among all the participants, 26 participants were categorized as the lower middle class while 21 participants were categorized as the upper middle class.

A total of 15 variants, including seven single consonants, /f, v, θ, ð, r, n, l/ and eight consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/ were focused on in the study. There were 125 simple English words chosen in this study so as to obtain a great number of tokens for analysis. Data were collected from a word list, two reading passages, answers to a passage selected by the participants among the two reading passages, and an interview. Participants' demographic information, qualitative data, and opinions of the participants were obtained through a questionnaire, in addition to an interview. The whole process of data collection lasted for around one hour to one and a half hour. The data collection started with two reading passages and answers to one passage. Next, participants were required to read the word list. After that, the participants had to fill in the questionnaire regarding their demographic information, educational level and background, English-learning experience, oral language use, and language attitudes. Finally, an interview was conducted in English for the collection of conversational data and the opinions from the participants.

Data were coded for three categories which were accurate production, feature change, and deletion. The factor groups were coded as gender, age, social class, frequency of oral English language use, speech style, linguistic environment, and syllable/word position. The statistical data were generated through the VARBRUL, which is used to examine whether a factor group has statistical significance for different types of production.

Chapter 4

Results and Findings

4.1 Introduction

This chapter will highlight the descriptive and statistical findings of the production of seven English singleton consonants /f, v, θ, ð, n, l, r/ and eight consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/ by 47 Cantonese L2 speakers of English. Data were collected from a word list, two reading passages, answers to a passage chosen among the two passages by participants, and an interview with the researcher. The English production by participants was categorized into three types of production. *Accurate production* refers to correct pronunciation of the consonants. It is based on the pronunciation of the consonants found in the Oxford Advanced Learners' Dictionary. *Feature change* refers to replacement of the consonants by other consonants, and *deletion* refers to omission of singleton consonants or liquids in consonant clusters.

The descriptive statistics show that the general results of the three types of production, including accurate production, feature change, and deletion, in terms of seven factor groups, which are gender, age, social class, frequency of oral English language use, speech style, linguistic environment, and syllable/word position. Besides the results of the seven factor groups, the findings of individual consonant will be presented to reveal how the target English consonants were produced by Cantonese L2 speakers of English. In order to show the significance of various factor groups, the statistics, a Variable Rule Analysis (VARBRUL), were run on the data.

The overall result of the production of the 15 English consonants will be first presented, followed by the descriptive findings of the seven factor groups in accurate production, feature change, and deletion. A comprehensive finding of all the 15 consonants /f, v, θ, ð, n, l, r/ and /pl, pr, bl, br, kl, kr, gl, gr/ will also be focused so as to offer a detailed description of the English consonants which underwent feature change and deletion, and to display a comparison among different consonants. After the presentation of the descriptive statistics, the VARBRUL statistics of the three types of production in terms of the seven factor groups will be shown. The analysis of the seven factor groups, which have different degrees of the significant effect on the three types of production, will be discussed in detail.

4.2 Results in Descriptive Statistics

The first part of this section will show a descriptive statistical result of the overall production and the distributions of the three types of production, which are accurate production, feature change, and deletion in seven factor groups, including gender, age, social class, frequency of oral English language use, speech style, linguistic environment, and syllable/word position. The second part will focus on the individual findings of the seven English singleton consonants, /f, v, θ, ð, n, l, r/ and eight consonant clusters, /pl, pr, bl, br, kl, kr, gl, gr/. This part will provide a thorough analysis of how the individual sounds were produced by Cantonese L2 speakers of English in this study.

4.2.1 Overall Finding of English Consonants Production

An overview of the English production is shown in this section. A total of 19666 tokens were produced in the three speech styles, consisting of a word list, two passages, and conversation, by 47 participants in the study. The numbers of tokens elicited from the word list and passages were similar, with 7403 tokens and 7400 tokens respectively. Compared with the reading tasks which elicited 75% of the overall production, 4863 tokens, that is 25% of the overall production, were elicited from conversations (see Table 4.2). All consonants were produced at a high accuracy rate with 82.9%, which reveals that the participants demonstrate a high caliber of pronouncing the target English consonants. Only 11.9% of the consonants were modified and 5.2% of them were deleted (see Table 4.1 below). After the overview of the English production, the details of the production in seven factor groups will be presented in the following section.

Table 4.1

Production of Consonants /f, v, θ, ð, r, l, n/ and /pr, pl, br, bl, kr, kl, gr, gl/

	Overall accurate production	**Feature change**	**Deletion**	**Total**
Number of tokens	16308	2341	1017	19666
%	82.9	11.9	5.2	100

4.2.2 Findings of Production in Seven Factor Groups

The current section will demonstrate the descriptive results of the production in the seven factor groups. The findings of the demographic factors, including gender, age, and social class, followed by frequency of oral English language use and speech style will be shown. Then, linguistic environment, consisting of a preceding front vowel, back vowel, diphthong, and a following front vowel, back vowel, and diphthong, and syllable/word position of a consonant, including syllable-onset, syllable-coda, word-initial, word-medial position, will be included in the analysis. The details are shown in Table 4.2 below.

Table 4.2

Production of Consonants in Accurate Production, Feature Change, and Deletion

Factor Group	Accurate production	Feature change	Deletion	Total
Total number of production	**16308**	**2341**	**1017**	**19666**
Total percentage of production	**82.9**	**11.9**	**5.2**	**100**
1. Gender				
Women				
#	8410	1126	491	10027
%	83.9	11.2	4.9	
Men				
#	7898	1215	526	9639
%	81.9	12.6	5.5	
2. Age				
20 – 30				
#	5598	734	242	6574
%	85.2	11.2	3.7	
31 – 45				
#	5230	979	452	6661
%	78.5	14.7	6.8	
46 – 60				
#	5480	628	323	6431
%	85.2	9.8	5	
3. Social Class				
Lower middle				
#	8495	1584	686	10765
%	78.9	14.7	6.4	
Upper middle				
#	7813	757	331	8901
%	87.8	8.5	3.7	

Factor Group	**Accurate production**	**Feature change**	**Deletion**	**Total**
Total number of production	**16308**	**2341**	**1017**	**19666**
Total percentage of production	**82.9**	**11.9**	**5.2**	**100**
4. Frequency of Oral English Language Use				
Frequent				
#	4225	292	152	4669
%	90.5	6.3	3.3	
Intermediate				
#	5816	717	315	6848
%	84.9	10.5	4.6	
Infrequent				
#	6267	1332	550	8149
%	76.9	16.3	6.7	
5. Speech Style				
Word List				
#	6127	958	318	7403
%	82.8	12.9	4.3	
Passage				
#	6068	961	371	7400
%	82	13	5	
Conversation				
#	4113	422	328	4863
%	84.6	8.7	6.7	

Factor Group	Accurate production	Feature change	Deletion	Total
Total number of production	**16308**	**2341**	**1017**	**19666**
Total percentage of production	**82.9**	**11.9**	**5.2**	**100**
6. Linguistic Environment				
Effect of a preceding vowel on coda				
Front				
#	2233	433	227	2893
%	77.2	15	7.8	
Back				
#	1065	333	220	1618
%	65.8	20.6	13.6	
Diphthong				
#	120	26	94	240
%	50	10.8	39.2	
Effect of a following vowel on onset				
Front				
#	7139	964	125	8228
%	86.8	11.7	1.5	
Back				
#	3796	293	258	4347
%	87.3	6.7	5.9	
Diphthong				
#	1955	292	93	2340
%	83.5	12.5	4	

Factor Group	Accurate production	Feature change	Deletion	Total
Total number of production	**16308**	**2341**	**1017**	**19666**
Total percentage of production	**82.9**	**11.9**	**5.2**	**100**
7. Syllable/Word Position				
Syllable onset (monosyllabic word)				
#	6520	807	200	7572
%	86.6	10.7	2.7	
Syllable coda (monosyllabic word)				
#	2204	637	541	3382
%	65.2	18.8	16	
Word-initial (disyllabic word)				
#	3660	470	185	4315
%	84.8	10.9	4.3	
Word-medial (disyllabic word)				
#	3924	426	90	4440
%	88.4	9.6	2	

4.2.2.1 Gender

Among the 47 participants, 24 women produced 10027 tokens and 23 men produced 9639 tokens (see Table 4.2).

Both groups of the participants are capable of pronouncing the 15 consonants accurately with more than 80% accuracy. However, women performed slightly better than men as women had 83.9% accuracy rate, which was 2% higher than that of men, who had 81.9% accuracy rate. More accurate production implies that lower percentages of consonants were modified and deleted by women. There were

11.2% and 12.6% of consonants undergoing feature change in women's production and men's production respectively. Same as feature change, consonants were less frequently deleted by women than men, with women having 4.9% and men having 5.5% deletion rate.

4.2.2.2 Age

Participants were divided into three age groups in which 16 participants were aged between 20 and 30, 16 participants were aged between 31 and 45, and 15 participants were aged between 46 and 60. The numbers of tokens produced by these three groups of participants are comparable and they are 6574, 6661, and 6431 (see Table 4.2). Both age groups of 20-30 and 46-60 had the same accuracy rate at 85.2%, which was higher than that of the middle group that had 78.5% accurate production. Regarding feature change, 14.7% of consonants produced by the middle group were modified and it was the highest percentage among the three age groups. The youngest participants modified consonants less than the participants aged between 31 and 45 as 11.2% of consonants were replaced by other consonants. For the group of 46-60, the participants had the least modification with only 9.8% of consonant's being changed. In deletion, English consonants were deleted most by the middle group at the rate of 6.8%, followed by the older participants, who deleted 5% of the consonants they produced. Although, compared with the group of 46-60, the participants aged between 20 and 30 had a higher percentage of feature change, they had a lower rate of deletion, with only 3.7%.

In general, the age group of 20-30 had the highest accuracy rate but the lowest deletion rate while the group of 31-45 had the lowest accuracy rate with the highest percentages in both feature change and deletion. Same as the group of 20-30, the group of 46-60 had the highest accuracy rate; yet, the percentage of feature change was the lowest.

4.2.2.3 Social Class

There were two divisions of social class in this study, the lower middle and the upper middle class. Based on participants' monthly salary, job occupation, and the situation in Hong Kong, 26 participants were categorized as the lower middle class and 21 participants as the upper middle class. As more participants were considered as the lower middle class, the number of tokens produced by them (10765 tokens) was higher than that of the upper middle class (8901 tokens) (see Table 4.2).

Comparing the two groups, the upper middle class participants produced the target consonants more correctly than the lower middle class participants, with the accuracy rate of 87.8% and 78.9% respectively. Opposite to the result of the accurate production, both the percentages of feature change and deletion of the lower middle class were higher than that of the upper-middle class. There were 14.7%

and 6.4% of the consonants produced by the lower middle class participants undergoing feature change and deletion. The percentages of feature change and deletion were lower in the upper middle class, and they were 8.5% and 3.7%.

The findings show that the upper middle class participants are able to pronounce the target consonants more accurately than the lower middle class participants as they have a higher accuracy rate but lower rates of feature change and deletion.

4.2.2.4 Frequency of Oral English Language Use

In frequency of oral English language use, participants were categorized into three groups, including frequent, intermediate, and infrequent use of oral English, based on their frequency of spoken English in daily life. Although English is the second language of the majority of Cantonese speakers in Hong Kong, not many Cantonese speakers would have the opportunity to speak English at home, at work, and/or with friends; in other words, they are not always immersed in an English-speaking environment. Hence, 20 participants perceived that they had an infrequent use of oral English language, 16 participants had an intermediate use of oral English, and only 11 participants frequently spoke English in their daily life.

The number of participants in each group is in direct proportion to the number of tokens produced by them. The total number of tokens produced by 20 infrequent oral English users was the highest, which was 8149 tokens, while the group of 11 speakers who frequently used English generated 4669 tokens from different speech styles (see Table 4.2). The amount of tokens, which is 6848 tokens, produced by the group of 16 intermediate users was in between other two groups. The data show that the accuracy rate of producing the target consonants is positively correlated with the frequency of oral English use, that means the more frequently the participants spoke English, the more tokens of the accurate production they made. Participants who frequently spoke English had the highest accuracy rate at 90.5%. Although the speakers who spoke English less frequently had a lower percentage of accurate production compared to the frequent oral English users, it was still at 84.9%. Participants who infrequently spoke English had the lowest accuracy rate at 76.9%. In contrast to the results of accurate production, infrequent users of oral English modified and deleted the consonants at the highest percentages, 16.3% and 6.7% respectively. For the participants who frequently spoke English, the percentages of feature change and deletion were the lowest. The percentages were less than half of those produced by the infrequent English speakers, and they were 6.3% and 3.3%. The rates of feature change and deletion of the participants with an intermediate use of oral English again were in the middle of the two groups, with 10.5% and 4.6% respectively.

Regarding frequency of oral English language use, the frequency of speaking English is positively related to the performance of the participants. Participants who often spoke English had more accurate production but less modification and deletion of the consonants, and vice versa.

4.2.2.5 Speech Style

Three types of speech style were taken into account in the present study, and they were word-list reading, passage reading, and conversation, which consisted of answers to a passage and an interview. The word list, with 7403 tokens, and two passages, with 7400 tokens (see Table 4.2), were designed based on 125 words with 15 target consonants; hence, the numbers of tokens produced in these two types of speech were relatively similar. Since some words were missed or pronounced incorrectly that it was unable to be classified, the numbers of tokens in the word list and passages were unequal. In the conversational data, apart from the answers to a passage that elicited some of the tested words, words produced by the participants in the interview were not constrained. Thus, only words with the target consonants and linguistic environment were considered, but the amount was less than that of other speech styles, with 4863 tokens.

Among the three styles, their percentages of accurate production are comparable. The accuracy rates of word list and passage are 82.8% and 82%.

Although these two styles had a fairly high level of accurate production, the accuracy rate of conversation, 84.6%, is surprisingly higher than that of both word list and passage. Regarding feature change, there were more than 10% of the English consonants modified in word list and passage, that was 12.9% and 13%, while only 8.7% of English consonants were modified in conversation. Unlike the result in feature change, the deletion rate, 6.7%, in conversation was the highest among all speech styles while consonants in word list were deleted least frequently at 4.3%. The deletion rate of passage, which was 5%, was slightly higher than that of word list but lower than that of conversation.

Comparing the three speech styles, the percentages in all types of production were similar. Therefore, speech style may not be a very crucial factor in influencing participants' English pronunciation. Further discussion with the VARBRUL statistical results will be shown in Section 4.3.

4.2.2.6 Linguistic Environment

For linguistic environment, both preceding and following vowels in monosyllabic and disyllabic words were taken into account. Consonants with a front vowel, /ɪ e æ i:/, a back vowel, /ʊ ɒ u: ɔ: ɑ:/, or a diphthong, /eɪ aɪ aʊ əʊ/, were analyzed, and there were a total of six groups of vowels, a preceding front vowel, back vowel, diphthong, as well as a following front vowel, back vowel, and diphthong. Generally, the number of tokens with a following vowel, 14915 tokens, was much greater than that of a preceding vowel, 4571 tokens. In the effect of a preceding vowel, tokens with a preceding diphthong, with 240 tokens, were produced the least among the six types of vowels (see Table 4.2). However, the amount of tokens with a preceding front vowel, that is 2893 tokens, was around 10 times more than that of a preceding diphthong, and 1618 tokens with a preceding back vowel were produced. In the effect of a following vowel, tokens with a following front vowel had the highest number of tokens, which is 8228 tokens, among all types of vowels and the number of tokens with a following back vowel, 4347 tokens, was almost half of those with a following front vowel. Compared with the tokens with a following front vowel and those with a following back vowel, tokens with a following diphthong had the smallest amount of tokens, that is 2340 tokens. The small number of tokens with a following diphthong is because only a small amount of words with a diphthong were elicited.

In accurate production, the production of tokens with a preceding vowel was relatively less than that of a following vowel. Among the tokens with a preceding vowel, tokens with a preceding front vowel had the highest accuracy rate of 77.2%, and tokens with a preceding back vowel had even less accurate production, at 65.8%. Yet, only half of the tokens with a preceding diphthong were produced accurately.

The results show that tokens with a preceding diphthong had the lowest accuracy rate among all tokens with a preceding vowel and tokens with a following vowel. For the effect of a following vowel on onset, all tokens with a following vowel had more than 80% accuracy. Tokens with a following back vowel had the highest rate at 87.3%, followed by the tokens with a following front vowel at 86.8%, and then a following diphthong which had 83.5%. Regarding feature change, 20.6% of the consonants with a preceding back vowel were modified and the percentage was the highest among all. Consonants with a preceding front vowel had the second highest rate of modification at 15%, followed by the consonants with a following diphthong at 12.5%, a following front vowel at 11.7%, and a preceding diphthong at 10.8%. Lastly, consonants with a following back diphthong, which was produced the most accurately, were modified the least by the participants, with only 6.7%. In deletion, consonants with a preceding diphthong were deleted at a high rate at 39.2%, followed by consonants with a preceding back vowel at 13.6%. For the consonants with other vowels, consonants were deleted at a percentage which was less than 10% (see Table 4.2) and consonants with a following front vowel only had 1.5% deletion rate, which was the lowest percentage among all.

In general, consonants with a following vowel were more accurately produced while those with a preceding vowel were replaced with another consonant more frequently. Apart from the consonants with a preceding back vowel and a preceding diphthong, the majority of the consonants were deleted at a very low percentage.

4.2.2.7 Syllable/Word Position

Apart from the linguistic environment, syllable and word positions were analyzed. In monosyllabic words, syllable-onset and syllable-coda positions were focused on. For example, the voiced labio-dental fricative /v/ is an onset in *van* /væn/ while it is a coda in *live* /lɪv/. In words with two syllables, word-initial and word medial positions were taken into account, regardless of the onset and coda position. For instance, /v/ is at the word-initial position in *value* /væl.ju:/ and it is at the word-medial position in *cover* /kʌv.ə/. In the data, more monosyllabic words were produced than disyllabic words. 7572 target consonants in the syllable-onset position in monosyllabic words were produced while only 3382 consonants, almost half of the number of onsets, in the syllable coda position were produced (see Table 4.2). In disyllabic words, the number of consonants in word-initial and word-medial position was relatively similar, with 4315 word-initial consonants and 4440 word-medial consonants.

Regarding the accurate production, except syllable-coda position which generated the lowest accuracy rate at 65.2%, syllable-onset, word-initial, and word-medial positions had a high accuracy rate ranging from 84.8% to 88.4% (see Table 4.2). In reverse, the percentages of feature change and deletion of the consonants in syllable-coda position were the highest and they were 18.8% and 16% respectively. Similarly, the percentages of these two types of production in syllable-onset, word-initial, and word-medial position did not vary widely. Around 10% of the consonants in these positions were modified and less than 5% of them were deleted. Consonants in the syllable-onset and word-medial positions were rarely deleted, with the rates of 2.7% and 2% respectively.

Generally, codas in monosyllabic words were more frequently replaced and deleted while consonants in other positions were pronounced more correctly. Since the codas in the analysis were at the end of a monosyllabic word, less attention might be paid to the consonants by the participants that the codas could be easily omitted. Further discussion of the effect of the syllable/word position will be presented in Section 4.3.

After the descriptive findings of the seven factor groups in the three types of production, the individual findings of all 15 consonants will be presented in the next section.

4.2.3 Findings of 15 Consonants

The results shown in the previous section in terms of the seven factor groups were analyzed in the VARBRUL statistics for the effect of the factor groups on the production of English consonants in Section 4.3. In the current section, all 15 consonants will be discussed so as to demonstrate a detailed analysis of the consonants which had the most and the least accurate production, which were replaced by other consonants, which were deleted the most frequently by the participants and so forth. There are 15 consonants, including seven singleton consonants /f, v, θ, ð, n, l, r/ and eight consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/, examined in the study. Except for /r/ which was rarely produced word-finally, singleton consonants which occurred word-initially and word-finally in monosyllabic words as well as word-initially and word-medially in disyllabic words were analyzed. For the consonant clusters, they were analyzed in word-initial position in monosyllabic words and word-initial/medial in disyllabic words since the target consonant clusters only appear as an onset.

The analysis of the findings is divided into two sections, which are the findings of singleton consonants and the findings of consonant clusters. The section on singleton consonants is divided into four parts, including the labio-dental fricatives /f, v/, the dental fricatives /θ, ð/, the alveolar nasal /n/ and the alveolar approximant /l/, and the post-alveolar approximant /r/. For the findings of consonant clusters, there are four parts of analysis consisting of /pl, pr/, /bl, br/, /kl, kr/, and /gl gr/.

In the following sections, a general overview of each consonant followed by the analysis of particular pronunciations of the consonants of the participants will be presented. Table 4.3 shows an overview of the three types of production of 15 consonants from high to low percentage. The findings will be presented individually in the following sections.

Table 4.3

Overall Findings for 15 Consonants

Accurate production (%)														
/f/	/bl/	/n/	/kl/	/pl/	/gl/	/r/	/br/	/pr/	/kr/	/gr/	/l/	/θ/	/v/	/ð/
98.3	97	95.7	94	92	88.2	86.9	85.7	81.6	79.3	78.9	75.6	66.5	65.1	43.1
Feature change (%)														
/ð/	/v/	/θ/	/gr/	/kr/	/r/	/gl/	/br/	/pr/	/n/	/l/	/f/	/bl/	/kl/	/pl/
56.9	34.8	33.4	19	15.6	13	7.4	6.3	4.1	4	1.5	1.1	1.1	1.1	0
Deletion (%)														
/l/	/pr/	/pl/	/br/	/kr/	/kl/	/gl/	/gr/	/bl/	/f/	/n/	/v/	/θ/	/r/	/ð/
22.9	14.3	8	8	5.1	4.9	4.4	2.1	1.9	0.6	0.3	0.1	0.1	0.1	0

4.2.3.1 Findings of the Singleton Consonants

This section will provide the results of the singleton consonants. The labio-dental fricatives /f, v/, the dental fricatives/θ, ð/, the alveolar nasal /n/ and the alveolar approximant /l/, will be discussed in pairs. As /f, v/ and /θ, ð/ are the voiceless and voiced counterparts, their findings will be shown in two separate sections. Besides, /n/ and /l/ were reported to be interchangeable (Chan & Li, 2000; Deterding et al., 2008) that they will be analyzed collectively. Finally, the remaining consonant, which is the post-alveolar approximant /r/, will be discussed at the end of the finding of singleton consonants. Since singleton consonants, except /l/, had a very low deletion rate ranging from 0% to 0.6%, deletion of /f, v, θ, ð, n, r/ will not be focused in the analysis.

Generally among all the singleton consonants, /f/ had the highest accuracy at 98.3% and it was followed by /n/ at 95.7% (see Table 4.4). The accuracy rate of /r/, 86.9%, was the third highest while that of /l/ at 75.6%, was at the middle among all. The production of /θ/ and /v/ were comparatively less accurately than the four consonants above, and only about two-third of them were pronounced correctly. Apparently, /ð/ had the lowest accuracy rate, but its percentage of feature change was the highest among all the singleton consonants. Around one-third of /v/ and /θ/ were modified, and they had the second and the third highest percentage of feature change. Although around one-tenth of /r/ was modified in the data, the percentage of feature change of /r/ was much lower than that of /ð/, /θ/, and /v/. For consonants /n/, /l/, and /f/, they were rarely replaced by other consonants as less than

5% of these consonants were modified. Regarding deletion, only /l/ was commonly deleted while other consonants were not. The detailed result of /l/ is presented in Section 4.2.3.1.3.

Table 4.4

Findings of the Seven Singleton Consonants

Accurate production (%)						
/f/	/n/	/r/	/l/	/θ/	/v/	/ð/
98.3	95.7	86.9	75.6	66.5	65.1	43.1
Feature change (%)						
/ð/	/v/	/θ/	/r/	/n/	/l/	/f/
56.9	34.8	33.4	13	4	1.5	1.1
Deletion (%)						
/l/	/f/	/n/	/v/	/θ/	/r/	/ð/
22.9	0.6	0.3	0.1	0.1	0.1	0

4.2.3.1.1 Findings of the Labio-Dental Fricatives /f, v/

Compared with the two labio-dental fricatives, their accurate production varied widely as the accuracy rate of /f/ was 30% higher than that of /v/, which had a high percentage of feature change.

Table 4.5 shows the general findings of the voiceless labio-dental fricative /f/ in all types of speech style. The voiceless fricative /f/ had the highest accuracy rate at 98.3% among the singleton consonants as well as among all the 15 consonants (see Table 4.3). Only 1.1% of /f/ was modified and 0.6% was deleted. /f/ was modified and deleted most often in *cough* /kɒf/. Due to the spelling of *cough*, several participants were likely to articulate /tʃ/ or /t/, or delete the sound instead of pronouncing /f/. Besides, few participants accidentally pronounced the voiced counterpart, /v/ in limited cases. As /f/ also appears in Cantonese, participants were generally capable of articulating this consonant.

Table 4.5

Findings of the Voiceless Labio-Dental Fricative /f/

/f/	Word List	Reading Passage	Conversation	Total
Accurate production # %	 784 98.2	 784 98.1	 515 98.7	 2083 98.3
Feature change # %	 10 1.3	 10 1.3	 4 0.8	 24 1.1
Deletion # %	 4 0.5	 5 0.6	 3 0.5	 12 0.6
Total #	 798	 799	 522	 2119

Unlike the voiceless labio-dental fricative /f/, the accuracy rate of the voiced labio-dental fricative /v/, that is 65.1%, was relatively low, and it was the second lowest percentage among all the consonants (see Table 4.3). On the other hand, the percentage of feature change, 34.8%, was the second highest among all the consonants. The voiced labio-dental fricative /v/ was commonly replaced by its voiceless counterpart /f/ and the bilabial approximant /w/. When /v/ occurred word-initially, in both monosyllabic and disyllabic words, /w/ was substituted for it. For instance, /v/ in *vet* /vet/ and *vanish* /væn.ɪʃ/ was pronounced as /wet/ and /wæn.ɪʃ/. However, when /v/ appeared word-medially and word-finally, for example in *cover* /kʌv.ə/ and *grieve* /gri:v/, it was devoiced to /f/.

From Table 4.6, it is surprising that the accuracy rate of /v/ in conversation is apparently much higher than that of word list and reading passage. In conversation, consonants commonly precede and follow other voiced sounds that voiced consonants may not be devoiced at a high degree. As /v/ does not appear in Cantonese, some Cantonese speakers may fail to produce it or they do not get used to articulating voiced sounds in reading word list when they read the word one by one. However, voiced consonants are easily protected by the adjacent voiced sounds that they could also be pronounced by Cantonese speakers in conversation. Yet, it should be noted that the majority of words with /v/ produced in the conversational data were disyllabic words, such as *level*, *never*, *clever*, and *very*, which were often pronounced correctly. Compared with the disyllabic words, /v/ in monosyllabic words was pronounced less accurately in conversation because it was frequently replaced by /f/ in the word-final position in monosyllabic words.

As stated previously, /v/ was commonly pronounced as /w/ word-initially and /f/ word-medially and word-finally. However, a variety of words in the conversational data reveal that /v/ in word-medial position was pronounced as /w/ in some cases, for example *event* /ɪˈvent/, *avoid* /əˈvɔɪd/ and *provide* /prəˈvaɪd/ were produced as /ɪˈwent/, /əˈwɔɪd/, and /prəˈwaɪd/. On the other hand, /v/ was devoiced in *clever* /ˈklev.ə/, *movie* /ˈmuː.vi/, and *level* /ˈlev.əl/, and they were pronounced as /ˈklef.ə/, /ˈmuː.fi/, and /ˈlef.əl/. This finding shows that /v/ is more likely to be replaced by /w/ in a stressed syllable in monosyllabic and disyllabic words while it is devoiced word-finally in monosyllabic words or word-medially in an unstressed syllable in disyllabic words.

Table 4.6

Findings of the Voiced Labio-Dental Fricative /v/

/v/	Word List	Reading Passage	Conversation	Total
Accurate production				
#	320	367	336	1023
%	56.8	65.2	75.5	65.1
Feature change				
#	243	196	107	546
%	43.2	34.8	24.1	34.8
Deletion				
#	0	0	1	1
%	0	0	0.4	0.1
Total				
#	563	563	444	1570

Although the participants did not have difficulties in pronouncing /f/, they might fail to pronounce /v/ which was replaced by /w/ in word-initial position or /f/ in word-medial and word-final positions. However, /w/ could be found to replace

/v/ in word-medial position in a stressed syllable in disyllabic words.

4.2.3.1.2 Findings of the Dental Fricative /θ, ð/

Both dental fricatives are absent in Cantonese, so it is not surprising that these consonants did not have a high percentage in accurate production. The percentages of /θ/ production in the three types of production were similar to that of /v/. The voiceless dental fricative /θ/ had the third lowest accuracy rate at 66.5% while it had the third highest percentage of feature change, with 33.4%, among all the 15 consonants (see Table 4.3).

Regarding the modification of /θ/, /f/ was the substitute for it in all positions in both monosyllabic and disyllabic words, for example in *thin* /θɪn/, *north* /nɔ:θ/, *healthy* /hel. θi/, /θ/ was frequently replaced by /f/ when it underwent feature change. It is possible that /θ/ is absent in the Cantonese language inventory, so the voiceless labio-dental fricative /f/ becomes the closest counterpart to replace /θ/. Since the place of articulation of /θ/ is dental and of /f/ is labio-dental, Cantonese speakers have a tendency to articulate /f/ in which the place of articulation is close to that of /θ/. Hence, the voiceless labio-dental fricative /f/, which also appears in Cantonese, is easier for Cantonese speakers to pronounce if they are unable to produce /θ/, or when speakers pay less attention to pronouncing this English consonant.

Table 4.7

Findings of the Voiceless Dental Fricative /θ/

/θ/	Word List	Reading Passage	Conversation	Total
Accurate production				
#	346	329	204	879
%	67.2	63.6	70.3	66.5
Feature change				
#	169	187	85	441
%	32.8	36.4	29.3	33.4
Deletion				
#	0	0	1	1
%	0	0	0.4	0.1
Total				
#	515	516	290	1321

The voiceless dental fricative /θ/ was found to have a comparatively low accuracy rate; yet, the accurate production of its voiced counterpart /ð/ was even 20% less than that of /θ/, with 43.1%, and it was the least among all the consonants. While /θ/ was commonly replaced by /f/, /ð/ also underwent frequent feature change and it was usually produced as /d/ and /f/. Among the 15 consonants, /ð/ had the lowest percentage of accurate production at 43.1% and the highest percentage of feature change at 56.9%. Moreover, /ð/ was the only consonant that the percentage of feature change was higher than that of accurate production.

In word-initial and word-medial positions, /ð/ was pronounced as /d/, for instance, *though*, *thousand*, and *brother* were pronounced as /dəʊ/, /daʊ.sənd/, and /brʌd.ə/. In syllable-final position in monosyllabic words, /f/ was substituted for /ð/. For example, *breathe* and *with* were produced as /bri:f/ and /wɪf/. Since the place of articulation of the dental sound /ð/ and the alveolar sound /d/ is close, participants might back their tongue to pronounce /d/ which was easier to articulate than a dental consonant because a dental fricative requires the tip of the tongue being placed between the upper and lower teeth. However, when /ð/ occurred word-finally, it might be considered as its voiceless counterpart /θ/ which was often replaced with /f/. Hence, it is possible that the replacement for /ð/ is /d/ or /f/, depending on the word position of the consonant.

Table 4.8

Findings of the Voiced Dental Fricative /ð/

/ð/	Word List	Reading Passage	Conversation	Total
Accurate production				
#	205	139	5	349
%	48.9	37.2	29.4	43.1
Feature change				
#	214	235	12	461
%	51.1	62.8	70.6	56.9
Deletion				
#	0	0	0	0
%	0	0	0	0
Total				
#	419	374	17	810

Apparently, the dental fricatives /θ, ð/ are difficult for Cantonese speakers because of their absence in Cantonese and difficult articulation compared with other consonants. Although /θ/ had a low accuracy rate, it was higher than that of its voiced counterpart /ð/. Regarding feature change, /f/ was a common replacement for /θ/ in all positions while /d/ was the substitution for /ð/ in word-initial and word-medial positions and /f/ for /ð/ in word-final position.

4.2.3.1.3 Findings of the Alveolar Nasal /n/ and the Alveolar Approximant /l/

In general, the alveolar nasal /n/ had 20% more of accurate production than the alveolar approximant /l/ (see Table 4.4). In the analysis, /n/ and /l/ in word-initial and word-final positions in monosyllabic words and in word-initial and word-medial positions in disyllabic words was taken into account.

The accuracy rate of /n/ was 95.7%, which was the third highest among 15 consonants, and only 4% of /n/ were modified (see Table 4.3). In general, /n/ was more frequently replaced by /l/ than it was deleted. Among all the production of /n/, coda /n/ was more accurately produced than onset /n/ and it was rarely deleted (see Table 4.9b). When /n/ was modified in onset position, it was pronounced as /l/. Occasionally, *net* /net/, *neglect* /nɪ.glekt/, and *brownie* /braʊ.ni/ were pronounced as /let/, /lɪ.glekt/, and /braʊn.li/.

Table 4.9a

Findings of the Alveolar Nasal /n/

/n/	Word List	Reading Passage	Conversation	Total
Accurate production # %	 910 97.3	 947 96.3	 783 93.1	 2640 95.7
Feature change # %	 22 2.4	 35 3.6	 53 6.3	 110 4
Deletion # %	 3 0.3	 1 0.1	 5 0.6	 9 0.3
Total #	 935	 983	 841	 2759

Table 4.9b

Findings of the Alveolar Nasal /n/ in Onset and Coda Positions

/n/	Onset	Coda	Total
Accurate production # %	 1398 92.7	 1242 99.3	 2640 95.7
Feature change # %	 110 7.3	 0 0	 110 4
Deletion # %	 0 0	 9 0.7	 9 0.3
Total #	 1508	 1251	 2759

For the alveolar approximant /l/, the lower accuracy rate at 75.6%, can be explained by /l/ deletion in word-final position in monosyllabic words. Vocalization of /l/ is considered as /l/ deletion in the current study because final /l/ is deleted even though there is a replacement of the high back vowel /u/. When /l/

appeared word-medially in disyllabic words, all data of /l/ were pronounced accurately. In feature change, /l/ was only replaced with /n/ when it occurred word-initially, for example in *lack* and *leader*, but indeed only 1.5% of /l/ was modified in total. However, there was 22.9% of /l/ deletion, which only happened word-finally in disyllabic words. For instance, *feel* /fi:l/, *full* /fu:l/, and *crawl* /krɔ:l/ were pronounced as /fiʊ/, /fu:/, and /krɔ:/. Table 4.10b reveals that final /l/ was deleted more than accurately produced since over half of the final /l/ was omitted. The findings show that vocalization of /l/, which is the use of vowel with the deletion of /l/, happened after a front vowel. Therefore, /l/ in *feel* /fi:l/, *real* /ri:l/, and *grill* /grɪl/ was vocalized and became /fiʊ/, /riʊ/, and /grɪʊ/. When a back vowel preceded /l/, /l/ was totally deleted as in the examples of *full* and *crawl*. Due to the large amount of deletion in word-final position, the accuracy rate of /l/ production was relatively lower.

Table 4.10a

Findings of the Alveolar Approximant /l/

/l/	Word List	Reading Passage	Conversation	Total
Accurate production				
#	491	468	770	1729
%	74.7	71.5	78.9	75.6
Feature change				
#	11	15	9	35
%	1.7	2.3	0.9	1.5
Deletion				
#	155	172	197	524
%	23.6	26.2	20.2	22.9
Total				
#	657	655	976	2288

Table 4.10b

Findings of the Alveolar Approximant /l/ in Onset and Coda Positions

/l/	Onset	Coda	Total
Accurate production			
#	1347	382	1729
%	97.5	42.2	75.6
Feature change			
#	35	0	35
%	2.5	0	1.5
Deletion			
#	0	524	524
%	0	57.8	22.9
Total			
#	1382	906	2288

From the above analysis, the alveolar nasal /n/ and alveolar approximant /l/ were, on occasion, produced interchangeably in word-initial position. Although /n/ was sometimes modified word-medially, this was not the case for word-medial /l/. Participants might not have problems in producing /n/ in general but they possibly had difficulties in articulating /l/ in word-final position in monosyllabic words as final /l/ deletion appeared frequently. Hence, this is the major reason for the relatively less accurate production of /l/ compared with that of /n/. Initial /l/ and /n/ was reported to be in free variation (Bolton & Kwok, 1990; Chan & Li, 2000; Hung, 2000), but the results demonstrate that the substitution of /l/ for /n/ is more common than that of /n/ for /l/ even though the percentages of feature change of both consonants are not great.

4.2.3.1.4 Findings of the Post-Alveolar Approximant /r/

The postalveolar approximant /r/ had 86.9% accurate production and 13% deletion. The percentages of these two types of production were at the middle among all the consonants (see Table 4.3). The results reveal that participants were generally capable of producing this consonant even though it does not appear in Cantonese. When /r/ was modified, /w/ was the replacement for it in all positions, including word-initial and word-medial positions. *Roof* /ru:f/, *regret* /rɪ.gret/, and *coral* /kɔ:.rəl/ were pronounced as /wu:f/, /wɪ.gret/, and /kɔ:.wəl/ when /r/ underwent feature change. As participants rarely pronounced /r/ in word-final position, such production was not considered in the data.

In comparison with other two approximants /n/ and /l/, /r/ was modified more frequently and its accurate production was more than /l/ but less than /n/ (see Table

4.4). Yet, the deletion rates of both /n/ and /r/ were very low.

Table 4.11

Findings of the Post-Alveolar Approximant /r/

/r/	Word List	Reading Passage	Conversation	Total
Accurate production				
#	453	413	504	1370
%	87.1	88.6	85.4	86.9
Feature change				
#	67	53	85	205
%	12.9	11.4	14.4	13
Deletion				
#	0	0	1	1
%	0	0	0.2	0.1
Total				
#	520	466	590	1576

4.2.3.2 Findings of the Consonant Clusters

Four pairs of consonant clusters, including /pl, pr/, /bl, br/, /kl, kr/, and /gl, gr/, are focused on in the present study. All target consonant clusters which appeared word-initially in monosyllabic words as well as word-initially and word-medially in disyllabic words were analyzed.

Table 4.12 shows that accurate production of the consonant clusters with /l/ was more than those with /r/. /bl/ was pronounced most accurately among all the consonant clusters and its accuracy rate was the second highest among all 15 consonants (see Table 4.3) while /gr/ was found to have the least accurate production among the consonant clusters. Although there was almost 20% of difference between the accurate production of /bl/ and /gr/, the accuracy rates of all the consonant clusters were about the average compared with that of the singleton consonants (see Table 4.3).

In feature change, apart from /bl/, /kl/, and /pl/, other consonant clusters had a various level of modification ranging from 4.1% to 19% (see Table 4.12). While /gr/ and /kr/ had the lowest percentages of accurate production, their percentages of feature change were the highest among the consonant clusters. Deletion in consonant clusters refers to the omission of the liquid, /l/ or /r/, in the consonant clusters instead of deletion of the whole cluster. The percentages of deletion of consonant clusters were higher than that of all the singleton consonants, except for /l/ deletion (see Table 4.3). Consonant cluster /pr/, followed by /pl/ and /br/, had a relatively frequent deletion in comparison with other consonant clusters in which /bl/ was the least frequently deleted. The following sections will highlight the results of the four pairs of consonant clusters.

Table 4.12

Findings of the Eight Consonant Clusters

Accurate production (%)							
/bl/	/kl/	/pl/	/gl/	/br/	/pr/	/kr/	/gr/
97	94	92	88.2	85.7	81.6	79.3	78.9
Feature change (%)							
/gr/	/kr/	/gl/	/br/	/pr/	/bl/	/kl/	/pl/
19	15.6	7.4	6.3	4.1	1.1	1.1	0
Deletion (%)							
/pr/	/pl/	/br/	/kr/	/kl/	/gl/	/gr/	/bl/
14.3	8	8	5.1	4.9	4.4	2.1	1.9

4.2.3.2.1 Findings of the Consonant Clusters /pl, pr/

While /pl/ was produced highly accurately at 92%, /pr/ had a lower accuracy rate at 81.6%. Generally, both consonant clusters had more deletion than feature change (see Table 4.13 and 4.14) and the deletion of /pr/ and /pl/ were the most frequent among the consonant clusters (see Table 4.12).

Only /pl/ deletion is discussed as none of the /pl/ production was modified. Although only 8% of /pl/ was deleted, the percentage was the second highest among the consonant clusters (see Table 4.12). Deletion of /pl/ was likely to happen in various environments and word positions, for example, *please*, *plot*, *play*, *platform*, and *complex*, would be pronounced as /pi:z/, /pɒt/, /peɪ/, /pæt.fɔ:m/, and /kɒm.peks/. However, it should be noted that /pl/ in *plot* and *play* had the most frequent deletion compared with other words with /pl/.

Table 4.13

Findings of /pl/

/pl/	Word List	Reading Passage	Conversation	Total
Accurate production				
#	345	349	74	768
%	92	92.8	88.1	92
Feature change				
#	0	0	0	0
%	0	0	0	0
Deletion				
#	30	27	10	67
%	8	7.2	11.9	8
Total				
#	375	376	84	835

In comparison with /pl/ which had no feature change, 4.1% of /pr/ was modified. The finding demonstrates that /pl/ was the common replacement for /pr/, for example, *press* /pres/, *problem* /prɒb.ləm/, and *deprive* /dɪ.praɪv/ were pronounced as /ples/, /plɒb.ləm/, and /dɪ.plaɪv/. However, /pr/ was rarely replaced by /pw/, which were only pronounced twice as /sə.pwaɪz/ for *surprise*. Regarding deletion, /pr/ was deleted at 14.3%, which was the highest among the consonant clusters and was the second highest among 15 consonants. Similar to /pl/, /r/ in /pr/ was deleted in diverse environments, such as in *print* /prɪnt/, *proof* /pru:f/, *precise* /prɪ.saɪs/, and *deprive* /dɪ.praɪv/. Yet, it is interesting to find out that /r/ was deleted in /pr/ relatively more frequently when /pr/ preceded /u:/ or /oʊ/ (/oʊ/ instead of /əʊ/ was articulated by participants), for instance, *proof* /pru:f/ and *progress* /proʊ.gres/ were often produced as /pu:f/ and /poʊ.gres/. In this environment, /r/ in /pr/ was usually deleted than changed to /l/. As the high back vowel /u:/ or the diphthong /ou/, which consists of a high back vowel, are more back than /r/, which is at the postalveolar position, the articulation of /r/ with /u:/ or /ou/ is near to each other that /r/ could be omitted easily. If a participant failed to articulate /r/ in /pr/ which preceded /u:/ or /ou/, it was more likely for them to delete /r/ than replace it with /l/.

Table 4.14

Findings of /pr/

/pr/	Word List	Reading Passage	Conversation	Total
Accurate production				
#	354	347	230	931
%	83.7	82.8	76.9	81.6
Feature change				
#	25	12	10	47
%	5.9	2.9	3.3	4.1
Deletion				
#	44	60	59	163
%	10.4	14.3	19.8	14.3
Total				
#	423	419	299	1141

To conclude, /pl/ was produced more accurately than /pr/ and it was not modified by the participants. In feature change, /pr/ was frequently replaced by /pl/ or rarely by /pw/. Deletion occurred more often than feature change in both consonant clusters. Both /pl/ and /pr/ were deleted in assorted environments and word positions. However, when /pr/ preceded /u:/ or /ou/, it was more likely to be deleted rather than to be substituted by /pl/.

4.2.3.2.2 Findings of the Consonant Clusters /bl, br/

The consonant cluster /bl/ had the highest percentage of accurate production at 97% among all the consonant clusters (see Table 4.12) and it was the second highest in accuracy among all the 15 consonants (see Table 4.3). Compared with /bl/, /br/ had a fair accuracy rate at 85.7%. Similar to /pl/ and /pr/, deletion was more common than feature change in the data of /bl/ and /br/. Besides, the percentage of /bl/ deletion was the lowest among the consonant clusters.

The rate of feature change of /bl/ was only 1.1%, which involved the substitution of /br/ for /bl/ in limited production. The percentage of /bl/ deletion was slightly higher but merely at 1.9% which was the lowest among all the consonant clusters. The lateral /l/ in *black*, *block*, and *blanket* was deleted, and the words were pronounced as /bæk/, /bɒk/, and /bæŋ.kɪt/.

Table 4.15

Findings of /bl/

/bl/	Word List	Reading Passage	Conversation	Total
Accurate production				
#	273	273	30	576
%	97.2	96.8	96.8	97
Feature change				
#	2	5	0	7
%	0.7	1.8	0	1.1
Deletion				
#	6	4	1	11
%	2.1	1.4	3.2	1.9
Total				
#	281	282	31	594

Similar to /bl/, /br/ was also occasionally modified and deleted in various environments. 6.3% of /br/ was replaced by /bl/ and more of it, that is 8%, was deleted. The result shows that words with /br/, such as *bruise*, *bracelet*, and *embrace* were sometimes pronounced as /bluːz/, /bleɪ.slet/, /ɪm.bleɪs/ or /buːz/, /beɪ.slet/, and /ɪm.beɪs/.

Table 4.16

Findings of /br/

/br/	Word List	Reading Passage	Conversation	Total
Accurate production				
#	324	353	199	876
%	86.6	83.6	88.1	85.7
Feature change				
#	28	32	4	64
%	7.5	7.6	1.7	6.3
Deletion				
#	22	37	23	82
%	5.9	8.8	10.2	8
Total				
#	374	422	226	1022

Compared with /br/, /bl/ was generally produced more accurately and it had the most accurate production among all consonant clusters. Also, the percentages of deletion of these two clusters were higher than that of feature change. Both /bl/ and /br/ were not specifically modified or deleted in a particular linguistic environment, which means that all environments were possible for the occurrence of feature change and deletion. When /bl/ and /br/ were modified, they were the counterparts for each other in the replacement.

4.2.3.2.3 Findings of the Consonant Clusters /kl, kr/

The accuracy rate of this pair of consonant clusters varied most widely among the four pairs of consonant clusters, and their difference was 14.7%. On one hand, /kl/ had 94% accuracy, which was the second highest among the consonant clusters. On the other hand, /kr/ had 79.3% accuracy, which was the second lowest among the clusters (see Table 4.12). The previous sections showed that there was more deletion than feature change in /pl, pr/ and /bl, br/. However, it was not the case for /kl, kr/ because /kl/ was deleted more frequently than modified while /kr/ was modified more than deleted.

With a high accuracy, /kl/ only had 1.1% feature change and 4.9% deletion. Feature change rarely occurred in /kl/. *Clap* /klæp/ was the only word in which /kl/ was replaced with /kr/ or /kw/ and was not deleted; therefore, it was pronounced as /kræp/ or /kwæp/. /kl/ deletion was likely to happen in any environments and positions; yet, the deletion rate was low.

Table 4.17

Findings of /kl/

/kl/	Word List	Reading Passage	Conversation	Total
Accurate production # %	 402 95.3	 394 93.4	 112 91.8	 908 94
Feature change # %	 6 1.4	 5 1.1	 0 0	 11 1.1
Deletion # %	 14 3.3	 23 5.5	 10 8.2	 47 4.9
Total #	 422	 422	 122	 966

In contrast to the result of /kl/, /kr/ had more feature change than deletion. 15.6% of /kr/ was substituted and it was the second highest percentage among all consonant clusters. The consonant cluster /kw/ was the common replacement for /kr/, which appeared word-initially and word-medially, for instance, *crab* /kræb/, *credit* /kred.ɪt/, and *increase* /ɪn.kri:s/ were pronounced as /kwæb/, /kwed.ɪt/, and /ɪn.kwi:s/. In addition, /kr/ would also be changed to /kl/, /gr/, and /gw/ in limited production. Among the words with /kr/, *create*, *credit*, and *increase* were found to be replaced with /kw/ the most frequently, with around half of the production being modified. For the pattern of /kr/ deletion, it was likely that deletion happened when /kr/ preceded a back vowel, for example, /u:/ and /ɔ:/. The data reveal that /kr/ was only omitted in *cruise* /kru:z/ and *crawl* /krɔ:l/ but it was still deleted mostly in *cruise*. Similar to /pr/ which had a high possibility to be deleted when it preceded /u:/ or /oʊ/, the articulation of /r/ in /kr/ and the back vowels, especially the high back vowel /u:/, is close that /r/ was easily deleted.

Table 4.18

Findings of /kr/

/kr/	Word List	Reading Passage	Conversation	Total
Accurate production # %	 306 81.8	 285 77	 68 78.2	 659 79.3
Feature change # %	 54 14.4	 67 18.1	 9 10.3	 130 15.6
Deletion # %	 14 3.8	 18 4.9	 10 11.5	 42 5.1
Total #	 374	 370	 87	 831

Participants were generally able to articulate /kl/, which had low percentages of feature change and deletion, but they might have difficulties in pronouncing /kr/. This cluster was rarely replaced by other sounds but was likely to be deleted in both word-initial and word-medial positions. In contrast to /kl/, /kr/ had a relatively high percentage of feature change that it was commonly changed to /kw/ and infrequently to /kl/, /gr/, and /gw/. Deletion of /kr/ tended to occur before a back vowel, such as /u:/ and /ɔ:/, even though the percentage of deletion was fairly low.

4.2.3.2.4 Findings of the Consonant Clusters /gl, gr/

The accurate production of /kl/ and /kr/ differed most widely among four pairs of consonant clusters. On the contrary, the variation of the accurate production of /gl/ and /gr/ was the smallest, with 9.3% difference. Although the accuracy rate of /gl/, 88.2%, was at the average, /gr/ had the lowest accuracy rate at 78.9% among the consonant clusters. In contrast to /pl, pr/ and /bl, br/, in which both had more deletion than feature change, /gl/ and /gr/ had more feature change than deletion.

Although the percentage of feature change of /gl/ was only 7.4%, it was the third highest among all the consonant clusters (see Table 4.10). Consonant clusters /gw/ and /gr/ were the common replacements for /gl/ usually in word-initial position, especially when /m/ was present within the same syllable. /gl/ was mostly modified in *gleam* /gli:m/ and *glamour* /glæm.ə/. *Gleam* was pronounced as /gwi:m/ or /gri:m/ while *glamour* was articulated as /gwæm.ə/ or /græm.ə/. Interestingly, /gw/ appeared more frequently in *glamour* while /gr/ was produced more commonly in *gleam*. It is possible that the bilabial nasal /m/ influences the pronunciation of /gl/ as the place of articulation of the bilabial approximant /w/ is close to /m/ that some participants were aware of pronouncing /m/, which caused them to articulate a bilabial consonant instead of /l/. Apart from /gw/ and /gr/, /dʒ/ was occasionally substituted for /gl/ in *neglect* /nɪ.glekt/; yet, this is possible that those participants did not know the accurate pronunciation of *neglect*.

The percentage of /gl/ deletion was lower than that of feature change and it was 4.4%. Similar to /gl/ which was mainly modified in certain words, /gl/ was deleted most frequently in *glory* but uncommonly in other words. Same as /pr/ and /kɤ/, /gl/ was deleted before a back vowel, which was /ɔ:/ in this case.

Table 4.19

Findings of /gl/

/gl/	Word List	Reading Passage	Conversation	Total
Accurate production				
#	284	284	102	670
%	87.1	86.3	97.1	88.2
Feature change				
#	28	27	1	56
%	8.6	8.2	1	7.4
Deletion				
#	14	18	2	34
%	4.3	5.5	1.9	4.4
Total				
#	326	329	105	760

/gr/ had the lowest accuracy rate but the highest rate of feature change, that is 19%, among all the consonant clusters (see Table 4.10). The most frequent substitution for /gr/ was /gw/, followed by /gl/. /gr/ was replaced by /gw/ in a wide range of words in both word-initial and word-medial positions. For example, *grab* /græb/, *grandpa* /grænd.pɑː/, and *regret* /rɪ.gret/ were pronounced as /gwæb/, /gwænd.pɑː/, and /rɪ.gwet/. However, *grab* and *grandpa* were most commonly modified compared with other words. From the data, /gr/ was more likely to be replaced with /gw/ when it appeared word-initially immediately before a low front short vowel /æ/. Another substitution /gl/ was hardly produced word-initially or word-medially in disyllabic words as it mainly replaced /gr/ in the word-initial position in monosyllabic words, for instance, *grass* /grɑːs/ and *groove* /gruːv/ were occasionally pronounced as /glɑːs/ and /gluːv/. Among all the words with /gl/

modification, *grass* was the one which was most frequently replaced with /gl/. Such production might be due to the confusion of *grass* and *glass* for certain participants. Besides /gw/ and /gl/, /kl/, /kr/, and /dʒ/ instead of /gr/ were produced in few cases and /dʒ/ replaced /gr/ particularly in *grieve* and *grill*. With a high rate of feature change, the deletion rate was only at 2.1% which was the second lowest among the consonant clusters. /gr/ was merely deleted in monosyllabic words, primarily in *grill*, *grass*, and *groove* and they were pronounced as /gɪl/, /gɑ:s/, and /gu:v/.

Table 4.20

Findings of /gr/

/gr/	Word List	Reading Passage	Conversation	Total
Accurate production # %	 330 78.4	 336 79.2	 181 79	 847 78.9
Feature change # %	 79 18.8	 82 19.3	 43 18.8	 204 19
Deletion # %	 12 2.8	 6 1.5	 5 2.2	 23 2.1
Total #	 421	 424	 229	 1074

Including /gl, gr/, all pairs discussed above had a higher percentage of accurate production in consonant clusters with /l/ than in /r/; however, the difference of /gl/ and /gr/ accurate production was the smallest among all the consonant clusters.

Moreover, their rates of feature change were greater than those of deletion. The findings show that /gl/ was majorly replaced by /gr/ and /gw/ word-initially and particularly when /m/ appeared after a vowel in the first syllable. Similar to /pr/ and /kr/, /gl/ was commonly deleted before a back vowel, which was /ɔː/ in this instance. Even though /gr/ was frequently substituted by /gw/ in word-initial and word-medial positions, it was changed to /gl/ in a limited condition, often in word-initial position in monosyllabic words. In addition to /gw/ and /gl/, a scattering of substitutes, such as /kl/, /kr/, and /dʒ/, appeared in few cases. While /gl/ deletion happened in both monosyllabic and disyllabic words, /gr/ deletion only occurred in monosyllabic words.

4.2.4 Summary of Descriptive Statistical Results

The descriptive statistical results of the seven factor groups, including gender, age, social class, frequency of oral English language use, speech style, linguistic environment, and syllable/word position, were discussed.

Among all the factor groups, the accuracy rates of the subgroups in gender and speech style were high and they did not differ widely with the difference of only 2% among the subgroups. The accurate production of the subgroups in age, social class, and frequency of oral English language use were also at a high percentage, but the variation among the subgroups was larger since the difference was ranging from 7%

to 15%. For the last two factor groups, the distinction of the subgroups varies at a greater level as the difference of the highest, and the lowest accuracy rate of the subgroups in linguistic environment and syllable/word position were 27% and 20% respectively.

For feature change, the difference among the subgroups in the seven factor groups was relatively smaller than that of accurate production because the highest percentage among all the subgroups was 20.6%, which was the effect of a preceding back vowel on coda, and the percentages of feature change of most of the subgroups were around 10%. The variation of the subgroups was the smallest in gender, age, and speech style due to the small difference of less than 5%. Although the difference of the subgroups in social class and syllable/word position was greater, it was merely 6.2% and 9.2%. Again, linguistic environment had the greatest variation among the subgroups with 13.9% difference, and frequency of oral English language use had the second largest difference, which was 10%.

Regarding deletion, the percentages differed widely only in the subgroups of linguistic environment and syllable/word position as the largest difference among the subgroups of these two factors were 37.7% and14%. For the remaining factor groups, which were age, gender, social class, frequency of oral English language use, and speech style, the variation among the subgroups only ranged from 0.6% to 3.4%.

To conclude, a noticeable variation did not appear in gender and speech style, but in linguistic environment and syllable/word position in the three types of production. For age, there was only a small difference among the subgroups in feature change and deletion while the variation in accurate production was greater. In social class, the difference of the upper middle and the lower middle class in deletion was small while there was a medium variation of these subgroups in accurate production and feature change. Finally, frequency of oral English language use was the only factor group in which the degree of variation of the subgroups was inconsistent in the three types of production since the difference among the subgroups was small in deletion but great in feature change.

Regarding the descriptive statistical results of the 15 English consonants, /f/ was pronounced most accurately by the participants while /ð/ had the least accuracy rate among all the 15 consonants. The voiced dental fricative /ð/ was the most difficult consonant for the participants as it was replaced by another consonant at the highest rate. /ð/ was mainly substituted by /d/ word-initially and word-medially, and /f/ word-finally. While /ð/ was replaced at the highest rate, /pl/ was the only consonant which did not undergo feature change. Although all the consonant clusters generally had a higher rate of deletion than the singleton consonants, /l/ was deleted most frequently among all the 15 consonants and it was the only consonant which had a higher rate of relation than the consonant clusters. Interestingly, /ð/ was substituted most but it was not deleted in any production by the participants.

Among all the singleton consonants, /f/ was produced most accurately, followed by /n/. The accuracy rate of /r/ was the third highest. The production of /θ/ and /v/ were comparatively less accurate, and /ð/ had the lowest accuracy rate with its highest percentage of feature change. Fricatives /v/ and /θ/ followed /ð/ as they had the second and the third highest percentage of feature change. The percentage of feature change of /r/ was much lower than that of /ð/, /θ/, and /v/ while those of /n/, /l/, and /f/ were the lowest because the participants did not encounter difficulties producing these consonants, which also occur in Cantonese. Regarding deletion, only /l/ was commonly deleted, primarily in coda syllable-coda position, while other consonants were not.

Focusing on the eight consonant clusters, the accuracy of the consonant clusters with /l/ was higher than those with /r/. Among all consonant clusters, /bl/ was pronounced most accurately while /gr/ was found to have the least accurate production. In feature change, apart from /bl/, /kl/, and /pl/, other consonant clusters had a various level of modification. /gr/ had the highest rate of feature change, followed by /kr/ among the consonant clusters. /gr/ was replaced by /gw/ in a wide range of words in both word-initial and word-medial position while /kr/

was commonly substituted by /kw/ word-initially and word-medially In deletion, /pr/, followed by /pl/ and /br/, had a relatively more frequent deletion compared with other consonant clusters in which /bl/ was least frequently deleted. The reasons for feature change and deletion of all the consonants will be shown in Section 5.6.

4.3 Results of the VARBRUL Statistics

In this study, a VARBRUL statistical analysis was conducted to determine the significant factor groups for the three types of production. In the VARBRUL analysis, accurate production, feature change, and deletion were the dependent variables while the seven factor groups, comprising gender, age, social class, frequency of oral English language use, speech style, linguistic environment, and syllable/word position, were the independent variables. A VARBRUL analysis was conducted on the data three times. For the first time, accurate production was run against feature change and deletion. Then, feature change was run against accurate production and deletion. Finally, deletion was run against accurate production and feature change. The analysis aimed at generating the significant effect of the seven factor groups on the three types of production. All factor groups were examined for the degree of favorable effect on each type of production. The VARBRUL analyses were run numerous times for each type of production in order to obtain the best model fit of factor groups. The best model fit indicates the best combination of the factor groups which generate the most significant result on the type of production. After each run, factor groups which were found to be statistically insignificant by VARBRUL were eliminated from further VARBRUL analyses for a more significant result.

The effect of a factor group is explained in a continuum that the higher the VARBRUL weight or input probability (p^i), the more the favorable effect of a factor on a particular type of production. Take the factor group of social class in accurate production as an example, the VARBRUL weight of the upper middle class (p^i = .580) was higher than that of the lower middle class (p^i = .434), so it implies that the upper middle class promoted accurate production over the lower middle class. After every run in each type of production, the input probabilities of several subgroups in certain factor groups were so similar that they were collapsed into the same subgroup. For example in syllable/word position, the VARBRUL weights of syllable-onset position in monosyllabic words, word-initial and word-medial position in disyllabic words were .544, .519, and .594 while the weight of syllable-coda position in monosyllabic words was .272. The VARBRUL weights of the three subgroups were so close that they were collapsed into the same group in further VARBRUL runs for the best model fit. It is not necessary to collapse the factors with similar probabilities into one factor but they are occasionally collapsed to yield the best goodness-of-fit which is the most significant for a type of production. Besides, the degree of the effect of the factor groups was measured by range, which is the difference between the highest VARBRUL weight and the lowest VARBRUL weight in a factor group. The higher the range, the stronger the effect of the factor group on a particular type of production.

Table 4.21 shows the VARBRUL statistical results of accurate production, feature change, and deletion. Generally, social class, linguistic environment, and syllable/word position were found significant in all types of production, and frequency of oral English language use was significant for accurate production and feature change while gender, age, and speech style were insignificant for all types of production. Factors which were found to have a significant effect on each type of production will be presented in detail in the following sections.

Table 4.21

VARBRUL Statistical Results of Three Types of Production

Factor Group	Accurate production	Feature Change	Deletion
Total			
N = 19666	**Number (n) = 16308**	**n = 2341**	**n = 1017**
%	**82.9**	**11.9**	**5.2**
Input probability	**.850**	**.108**	**.031**
1.Gender			
Women			
p^i	.528n.s.*	.473n.s.	.481n.s.
#	8410	1126	491
%	51.6	48	48.3
Men			
p^i	.471n.s.	.528n.s.	.520n.s.
#	7898	1215	526.
%	48.4	52	51.7
Range	.057	.055	.039
2. Age			
20 – 30			
p^i	.590n.s.	.444n.s.	.363n.s.
#	5598	734	242
%	34.3	31.3	23.8
31 – 45			
p^i	.432n.s.	.555n.s.	.577n.s.
#	5230	979	452
%	32	41.8	44.4
46 – 60			
p^i	.478n.s.	.500n.s.	.562n.s.
#	5480	628	323
%	33.7	26.9	31.8
Range	.158	.111	.214

Factor Group	Accurate production	Feature Change	Deletion
Total			
N = 19666	**Number (n) = 16308**	**n = 2341**	**n = 1017**
%	**82.9**	**11.9**	**5.2**
Input probability	**.850**	**.108**	**.031**
3. Social class			
Lower middle			
p^i	.434	.559	.569
#	8495	1584	686
%	52	67.7	67.5
Upper middle			
p^i	.580	.429	.416
#	7813	757	331
%	48	32.3	32.5
Range	.146	.130	.153
4. Frequency of Oral English Language Use			
Frequent			
p^i	.639	.360	.381n.s.
#	4225	292	152
%	25.9	12.5	14.9
Intermediate			
p^i	.456**	.545**	.490n.s.
#	5816	717	315
%	35.7	30.6	31
Infrequent			
p^i	.456**	.545**	.577n.s.
#	6267	1332	550
%	38.4	56.9	54.1
Range	.183	.185	.196

Factor Group	Accurate production	Feature Change	Deletion
Total			
N = 19666	**Number (n) = 16308**	**n = 2341**	**n = 1017**
%	**82.9**	**11.9**	**5.2**
Input probability	**.850**	**.108**	**.031**
5. Speech Style			
Word list			
p^i	.499n.s.	.524n.s.	.452n.s.
#	6127	958	318
%	37.6	40.9	31.3
Passage			
p^i	.483n.s.	.528n.s.	.492n.s.
#	6068	961	371
%	37.2	41	36.5
Conversation			
p^i	.527n.s.	.420n.s.	.585n.s.
#	4113	422	328
%	25.2	18.1	32.2
Range	.044	.108	.133

Factor Group	Accurate production	Feature Change	Deletion
Total			
N = 19666	**Number (n) = 16308**	**n = 2341**	**n = 1017**
%	**82.9**	**11.9**	**5.2**
Input probability	**.850**	**.108**	**.031**
6. Linguistic Environment			
Effect of a preceding vowel on coda			
Front			
p^i	.639**	.483**	.385**
#	2233	433	227
%	13.7	18.5	22.3
Back			
p^i	.428**	.565**	.385**
#	1065	333	220
%	6.5	14.2	21.6
Diphthong			
p^i	.313	.483**	.743**
#	120	26	94
%	0.7	1.1	9.2
Effect of a following vowel on onset			
Front			
p^i	.639**	.483**	.385**
#	7139	964	125
%	43.8	41.2	12.3
Back			
p^i	.639**	.483**	.743**
#	3796	293	258
%	23.2	12.5	25.4
Diphthong			
p^i	.428**	.565**	.618
#	1955	292	93
%	12.1	12.5	9.2
Range	.326	.082	.358

Factor Group	Accurate production	Feature Change	Deletion
Total			
N = 19666	**Number (n) = 16308**	**n = 2341**	**n = 1017**
%	**82.9**	**11.9**	**5.2**
Input probability	**.850**	**.108**	**.031**
7. Syllable/Word Position			
Syllable-onset (monosyllabic word)			
p^i	.549**	.473**	.351**
#	6520	807	200
%	40	34.5	19.7
Syllable-coda (monosyllabic word)			
p^i	.278	.629	.888
#	2204	637	541
%	13.5	27.2	53.2
Word-initial (disyllabic word)			
p^i	.549**	.473**	.522
#	3660	470	185
%	22.4	20.1	18.2
Word-medial (disyllabic word)			
p^i	.549**	.473**	.351**
#	3924	426	90
%	24.1	18.2	8.9
Range	.271	.156	.537
Chi-square	36.662	31.368	34.675
df	5	4	5
Significance	p < .001	p < .001	p < .001

* n.s. = not significant

**these factors were collapsed into one factor because of similar input probabilities

in earlier runs

4.3.1 Results of Accurate Production

The significant factor groups for accurate production are highlighted in this section. The tokens of accurate production were run against the tokens of feature change and deletion. 16308 out of 19666 tokens, that is 82.9% of the target consonants, were produced accurately. Among the seven factor groups, social class, frequency of oral English language use, linguistic environment, and syllable/word position were found to be significant for accurate production ($X^2 = 36.662$, 5 df, $p < .001$) (see Table 4.21). The effect of linguistic environment and syllable/word position was relatively stronger than that of social class and frequency of oral English language use as they had a greater variation in their ranges. In fact, social class, linguistic environment, and syllable/word position had a significant effect on all the three types of production, including accurate production, deletion, and feature change. Moreover, social class was the only extralinguistic factor which was significant for all types of production.

Social class was categorized into the lower middle class and the upper middle class. In comparison with other significant factor groups, social class had the weakest effect on accurate production (range .146). The results show that the upper middle class (p^i .580) promoted accurate production over the lower middle class (p^i .434). Although the difference between the two classes was not great, the finding still implies that participants from the upper middle class articulated the target consonants more accurately than those from the lower middle class.

Apart from social class, frequency of oral English language use was another extralinguistic factor which was significant for accurate production. Frequency of oral English language use was categorized into frequent use, intermediate use, and infrequent use of oral English based on the frequency of oral English that the participants used in daily life. Intermediate use (p' .508) and infrequent use (p' .404) were collapsed into the same group as their initial VARBRUL weights were close, and a significant result could not be generated without the collapse. After collapsing the two subgroups, frequent use (p' .639) had a more favorable effect on accurate production over intermediate use and infrequent use (p' .456) (see Table 4.21). Similar to social class, the effect of frequency of oral English language use was not strong; yet, it was relatively stronger than that of social class, with the range of .183. This finding reveals that the frequency of oral English use is important for accurate English pronunciation of Cantonese speakers because participants who spoke English frequently were more capable of pronouncing the English consonants accurately than those who did not speak English very often. Hence, it is likely that Cantonese speakers of English possibly have a better English pronunciation if they speak English frequently.

After the results of the extralinguistic factors, the findings of the linguistic factors are discussed below. Linguistic environment consisted of the effect of a preceding vowel in coda position and the effect of a following vowel in onset position. Front vowels /ɪ e æ i:/, back vowels /ʊ ɒ u: ɔ: ɑ:/, and diphthongs /eɪ aɪ aʊ əʊ/ were focused. Thus, there were a total of six subgroups, including a preceding front vowel, a preceding back vowel, a preceding diphthong, a following front vowel, a following back vowel, and a following diphthong. The effect of a preceding front vowel on coda, a following front vowel, and a following back vowel on onset (p^i .639) favored accurate production over the effect of a preceding back vowel on coda and a following diphthong on onset (p^i .428). Among the six subgroups, the effect of a preceding diphthong on coda (p^i .313) was the least favorable in accurate production. Yet, it should be noted that the number of tokens with a preceding diphthong was so small that the finding may not be very representative. Comparing with other factor groups, linguistic environment had a stronger effect on accurate production as its range was .326.

The last factor group which was significant for accurate production was syllable/word position. Syllable/word position was constituted by syllable-onset and syllable-coda positions in monosyllabic words as well as word-initial and word-medial positions in disyllabic words. Except for syllable-coda position, syllable-onset (p^i .544), word-initial (p^i .519) and word-medial position (p^i .594) were collapsed due to the similar VARBRUL weights at the first run. Eventually, it was found that the three subgroups (p^i .549) favored accurate production over syllable-coda position (p^i .278). The effect of syllable/word position, with the range of .271, was weaker than that of linguistic environment but was stronger than that of social class and frequency of oral English language use.

To conclude, social class, frequency of oral English language use, linguistic environment, and syllable/word position were found to be significant for accurate production. Among the four factor groups, linguistic environment, followed by syllable/word position had a comparatively stronger effect than frequency of oral English language use and social class on accurate production. On the contrary, two demographic factors, gender and age, as well as speech style were not significant for accurate production, in addition to feature change.

4.3.2 Results of Feature Change

In this section, four factor groups, which had a significant effect on feature change, were focused on. More than one-tenth of the tokens, that is 2341 tokens, underwent feature change. The tokens of feature change were run against the tokens of accurate production and deletion in the VARBRUL. Same as the findings in accurate production, social class, frequency of oral English language use, linguistic environment, and syllable/word position had a significant effect on feature change ($X^2 = 31.368$, 4 df, $p < .001$) (see Table 4.21). In general, the findings of feature change of social class, frequency of oral English language use, and syllable/word position were contrastive to that of accurate production. The effects of social class, frequency of oral English language use, and syllable/word position were comparable and they were relatively stronger than the effect of linguistic environment, which was found to be very weak.

Opposite to the result in accurate production, the lower middle class (p^i .559) promoted feature change over the upper middle class (p^i .429), and the range was .130. Therefore, the effect of social class on feature change was similar to its effect on accurate production as the effect was not very strong. Still, the result indicates that consonants were modified more frequently by the lower middle class participants than the upper middle class participants.

Among the four factors which were found to have a significant effect on feature change, the effect of frequency of oral English language use, with the range of .185, was the greatest even though it was not very strong. The finding of feature change was contrasting to that of accurate production because intermediate and infrequent use (p^i .545) of oral English had a more favorable effect than frequent oral use of English (p^i .360) on feature change. The finding shows that speaking

English frequently does not only lead to more accurate pronunciation but also less modification on the English consonants. In other words, if Cantonese speakers speak English occasionally or infrequently, their pronunciation is likely to be less accurate and more consonants would be modified.

Linguistic environment was found to be significant for feature change; yet, the effect was the weakest among the four factor groups because the range was only .082. Six subgroups were collapsed into two subgroups due to their similar VARBRUL weights. Finally, the VARBRUL generated a result that the effect of a preceding back vowel on coda and that of a following diphthong on onset (p^i .565) favored feature change over the effect of a preceding front vowel and diphthong on coda, as well as the effect of a following front and back vowel on onset (p^i .483).

The subgroups of syllable/word position in feature change were collapsed in the same way as in accurate production and their findings were contrasting because syllable-coda position (p^i .629) promoted feature change over syllable-onset, word-initial, and word-medial position (p^i .473). The degree of the effect of syllable/word position (range .156) was weaker than that of frequency of oral English language use but stronger than that of social class and linguistic environment.

The results of feature change were similar to that of accurate production that social class, frequency of oral English language use, linguistic environment, and syllable/word position were found to have a significant effect while gender, age, and speech style were still insignificant for the two types of production. Regarding the degree of the significant effect on feature change, the order of the factor groups was distinct from that of accurate production. In feature change, frequency of oral English language use had the strongest effect, followed by syllable/word position, social class, and finally linguistic environment. It should be noted that linguistic environment had the greatest difference because its effect was the strongest in accurate production but the weakest in feature change. Frequency of oral English use was similar to linguistic environment because its effect was the strongest in feature change but ranked the third in accurate production. On the other hand, syllable/word environment was the only factor group which ranked the same for its effect, the second strongest, on both types of production. Social class generally had a relatively weak effect on both accurate production and feature change.

4.3.3 Results of Deletion

The data show that a total of 5.2% of the consonants, that is 1017 tokens, were deleted. The tokens of deletion were run against the tokens of accurate production and feature change in the VARBRUL. In accurate production and feature change, four factor groups, including social class, frequency of oral English language use, linguistic environment, and syllable/word position, were found to be significant. However, only three factor groups, which were social class, linguistic environment, and syllable/word position, were significant for deletion ($X^2 = 34.675$, 5 df, $p < .001$) (see Table 4.21). Except for frequency of oral English language use, all of the three factor groups had a significant effect on the three types of production. The results demonstrate that the effect of syllable/word position on deletion was the strongest while social class was the weakest.

Social class was the only extralinguistic factor which was significant for all types of production despite its comparable and relatively weak effect on each type of production. Same as the result in feature change, the lower middle class (p^i .569) favored deletion over the upper middle class (p^i .416). This finding implies that participants from the lower middle class pronounced the consonants less accurately than those from the upper middle class as consonants were more likely to be modified and deleted by them.

The two linguistic factors were found to be significant for all types of production, and their effect on deletion was the greatest among all factor groups in all types of production. The VARBRUL weight of the effect of a preceding diphthong on coda and the effect of a following back vowel on onset was the highest (p^i .743). These two subgroups had a more favorable effect on deletion over the effect of a following diphthong on onset (p^i .618), followed by the effect of a preceding front vowel, a preceding back vowel on coda, and a following front vowel on onset (p^i .385). The range of linguistic environment was .358, which was smaller than that of syllable/word position but greater than that of social class.

The level of significance was the highest in syllable/word position due to its greatest range of .537 among the three significant factor groups. Syllable-coda position (p^i .888) had the most favorable effect on deletion and it favored over word-initial position (p^i .522) as well as syllable-onset and word-medial positions (p^i .351). Syllable/word position always had the strongest or the second strongest effect on the three types of production; hence. its effect was comparatively stronger than other significant factor groups in general.

In comparison with accurate production and feature change, there were only three factors, including social class linguistic environment, and syllable/word position, found to be significant for deletion while four factors, which were gender, age, frequency of oral English language use, and speech style, were insignificant for this type of production. Syllable/word position had the strongest effect on deletion and it was followed by linguistic environment and lastly social class. Still, frequency of oral English language use, which was significant for accurate production and feature change, was found to be not significant for deletion. Only social class, linguistic environment, and syllable/word position had a significant effect on all three types of production.

4.3.4 Summary of the VARBRUL Statistical Results

Table 4.22 provides a summary of the effect of the seven factor groups, including gender, age, social class, frequency of oral English language use, speech style, linguistic environment, and syllable/word position, on accurate production, feature change, and deletion. All linguistic factors were found to be significant for all types of production while there was only one extralinguistic factor, that is social class, was found to be the same. On the contrary, three out of five extralinguistic factors had no significant effect on any types of production and they were gender, age, and speech style. Also, the linguistic factors generally had a stronger effect than the extralinguistic factors on all types of production.

Social class, frequency of oral English language use, linguistic environment, and syllable/word position had a significant effect on accurate production. The effect of linguistic environment (range .326) was the strongest, followed by syllable/word position (range .271), frequency of oral English language use (range .183), and lastly social class (range .146). Although the above four factors were also significant for feature change, the degree of the effect and the ranking of the factors were not the same. Frequency of oral English language use (range .185) became the strongest factor in affecting feature change while syllable/word position had the same ranking as in accurate production, with the range of .156. Social class even had a weaker effect with the range of .130 and linguistic environment (range .082), which was the strongest effect on accurate production, became the weakest among all. Regarding deletion, the degree of the effect of the significant factor groups varied at a greater level in comparison with accurate production and feature change. Syllable/word position (range .537) had the strongest effect on deletion and the effect of another linguistic factor, which was linguistic environment (range .358), was weaker than that. The weakest effect on deletion was social class, which had the range of .153. The results show that linguistic factors were comparatively more influential in English consonant production by Cantonese speakers of English as they often had a greater range in the production. However, extralinguistic factors were less likely to play a crucial role in different types of production due to the insignificant effect of gender, age, and speech style in the three types of production and a fairly weak effect of social class and frequency of oral English language use on them.

In the three types of production, the significant factors generally had a relatively weak effect on feature change because the range was less than .200. The effects of the factor groups were stronger on accurate production as the ranges in the factor groups differed in a greater level. Still, deletion was mostly influenced by the significant factor groups as the ranges were more widely distributed.

Table 4.22

Summary of the VARBRUL Findings

Factor groups	**Accurate production**	**Feature Change**	**Deletion**
Gender	n.s.*	n.s.	n.s.
Age	n.s.	n.s.	n.s.
Social class	Upper-middle > lower-middle	Lower-middle > upper-middle	Lower-middle > upper-middle
Frequency of oral English language use	Frequent > intermediate, infrequent	Intermediate, infrequent > frequent	n.s.
Speech style	n.s.	n.s.	n.s.
Linguistic environment	Preceding front vowel, following front, following back vowel > Preceding back vowel, following diphthong > Preceding diphthong	Preceding back vowel, following diphthong > Preceding front, preceding diphthong, following front vowel, following back vowel	Preceding diphthong, following back vowel > Following diphthong > Preceding front, preceding back vowel, following front vowel
Syllable/Word position	Syllable-onset, word-initial, word-medial position > syllable-coda position	Syllable-coda position > syllable-onset, word-initial, word-medial position	Syllable-coda position > word-initial position > syllable-onset, word-medial position

*n.s. = non-significant

4.4 Summary

Among all the factor groups, the percentages of the subgroups in gender and speech style did not differ widely in accurate production, feature change, and deletion; hence, significant results were possibly not generated in the VARBRUL analysis. The percentages of the subgroups in age, social class, and frequency of oral English language use in the three types of production had a greater variation among the subgroups. Yet, only social class was found to be significant in all types of production while age was not significant for all types of production. Frequency of oral language use was a significant factor for only accurate production and feature change. The results and the reasons for the effect of these factors will be discussed in the next section. For the last two factor groups, which are linguistic environment and syllable/word position, the distinction of the subgroups varied at a greater level, and it is not surprising that a significant effect was generated in the VARBRUL analysis.

The results of the four research questions based on the descriptive and VARBRUL statistical findings will be presented in Chapter 5.

Chapter 5

Discussion

5.1 Introduction

This chapter will provide a discussion about the four research questions based on the findings in Chapter 4. First, the effect of demographic factors on the three types of pronunciation will be presented. Next, there will be a discussion about the influence of frequency of oral English language use in relation to other factors, such as social class and educational background, on the English pronunciation by Cantonese speakers. The performance of the participants on different speech styles, in addition to the effect of speech style will be shown in the third question. Finally, linguistic factors along with the Markedness Differential Hypothesis (MDH) and the transfer from Cantonese to English will be discussed.

5.2 Research Questions and Discussion

The descriptive and VARBRUL statistical findings were presented in the previous section. This section will aim at discussing the findings in relation to the research questions. The research questions are reiterated follows:

1. What is the effect of demographic factors, including gender, age, and social class, on accurate production, feature change, and deletion?

2. What is the effect of frequency of oral English language use at home, at work, and with friends on accurate production, feature change, and deletion?
3. How do the participants perform in different speech styles? Is speech style significant for accurate production, feature change, and deletion?
4. Does linguistic environment (preceding front vowel, preceding back vowel, preceding diphthong, following front vowel, following back vowel, and following diphthong) and syllable/word position of a consonant affect accurate production, feature change, and deletion?

The research questions will be discussed in relation to the previous reviews and the opinions collected from the participants in order to understand the actual reasons for English phonological variation by Cantonese speakers in Hong Kong. The discussion together with the production and opinions ~~by~~ the participants will be presented in the following sections.

5.3 Research Question 1

What is the effect of demographic factors, including gender, age, and social class, on accurate production, feature change, and deletion?

Regarding the VARBRUL statistical results of the demographic factors, both gender and age were found not to be significant for accurate production, feature change, and deletion. Only social class was a significant factor for the three types of production. The empirical data and the effect of each factor will be presented first and will be discussed in detail.

5.3.1 Gender

The descriptive statistics show that the women produced the 15 consonants relatively more accurately than men, but the accuracy rates of the two groups were comparable, with only a 2% difference (see Table 4.2). In the VARBRUL statistical results, it was found that gender was not significant in accurate production, feature change, and deletion (see Table 4.21). The VARBRUL weights of women and men in the three types of production were around .500, which implies that the effect of women or men did not favor the production over each other. Also, the range of gender in accurate production, feature change, and deletion were .057, .055, .039 respectively. These results also indicate that the difference of each type of production between women and men was so trivial that it was insignificant for all types of production. All the findings of gender are consistent in a way that both the descriptive and VARBRUL statistics suggest gender was not a significant factor for all types of production. The finding suggests that women and men in Hong Kong may have similar English productions since neither women nor men in this study pronounced English sounds much better over another group, and neither one of the groups modified the 15 consonants in a particular pattern.

The finding is contradictory with the general view of women speaking English better than men as expressed by the participants in the interviews. Women and men in Interview Question 9 (see Appendix D) refer to those who are Cantonese speakers in Hong Kong. From the data obtained in the interviews, 34 out of 47 participants agreed that women had better English pronunciation than men, and this was the case among their friends based on their observation. Yet, 10 participants either disagreed with this statement or they believed that the English pronunciation between men and women were similar. Furthermore, three participants replied that they did not notice whether men or women had better English pronunciation because they lacked experience in listening to the English spoken by Cantonese speakers. Compared women with men, a higher number of women agreed with women's better English pronunciation because 20 out of 24 women agreed with the statement while 14 out of 23 men agreed with it. The participants' views expressed in the interviews could be concluded into four categories. They believed that women 1) were more talented in languages or had higher ability in learning languages; 2) were more attentive to or aware of pronunciation; 3) were more presentable and expressive; and 4) paid more effort in learning languages. Apparently, participants generally had a positive view towards women acquiring languages. They believed women's better performance on languages was attributed to the nature and the personalities or characteristics of typical women who are patient, attentive, and expressive.

Some of the previous research studies have shown that gender differentiation due to sociocultural influences plays a significant role in linguistic variation in first language (Marshall, 2003; Milroy & Milroy, 1978; Romaine, 1978; Trudgill, 1972, 1974) and second language use (Adamson & Regan, 1991; Major, 1994; Mougeon & Rehner, 2001; Rehner et al., 2003). All these studies and reviews showed that women or girls frequently used the standard or prestige variants more than men or boys. Women's common use of the standard variants could be largely accounted for by women's consciousness of social status (Chambers, 2009; Romaine, 1978; Trudgill, 1972, 1974), linguistic insecurity (Labov, 2006; Adamson & Regan, 1991), avoidance of being viewed as the lower class (Gordon, 1997), and frequent social networking (Milroy & Milroy, 1978; Cameron, 2009). On the contrary, other studies (Rehner & Mougeon, 1999; Dewaele, 2004; Purcell & Suter, 1980; Suter, 1976) found that there was no correlation between gender and linguistic variation, in which the findings in the present study conform to these studies.

The results in the current study demonstrate that gender is not significant for accurate production, feature change, and deletion of the 15 consonants. It implies that gender has no influence on Cantonese speakers' English pronunciation. First, English may not be the primary language spoken by Cantonese speakers in Hong Kong, and thus the effect of other social or extralinguistic factors, such as frequency of oral English language use, family and educational background, on English phonological variation possibly overrides the effect of gender. Second, women in Hong Kong tend to strive for a higher social position with better education, work performance, and financial independency instead of using standard or prestige English variants. Although it may be argued that higher education and better work performance reflects good mastery of English of Cantonese speakers, high English proficiency of the speakers does not entail better English pronunciation. In reverse, accurate or better English pronunciation of Cantonese speakers possibly indicates high English proficiency. The details regarding the relationship of English pronunciation and general English proficiency will be discussed in Section 5.3.3.

Unlike the studies in New York (Labov, 2006), Norwich (Trudgill, 1972), or

Belfast (Milroy & Milroy, 1978), where English is the first language and linguistic variables are important to reveal speakers' identity or social status, English is the second language of the Cantonese speakers in Hong Kong. Frequency of oral English language use in daily life is likely to be one of the extralinguistic factors that overrides the effect of gender on English phonological variation of Cantonese speakers because it was found to be significant for accurate production and feature change. Its effect on the English pronunciation of Cantonese speakers will be discussed in detail in Section 5.4; yet, frequency of oral English language use could be applicable to the concept of social network (Milroy & Milroy, 1978, 1980, 1992) regarding strong and weak connection with English speakers in the Hong Kong context. A detailed analysis will be provided in Section 5.3.3

Although gender inequality occurs in Hong Kong in that men are dominant in government, politics, and business sectors, there is a tendency that women in Hong Kong strive for a higher social position with better education, work performance, and financial independency. As linguistic symbols are not the key element to reveal women's social status in Hong Kong, the consciousness of social status and linguistic insecurity may not be applicable to the situation in Hong Kong. In fact, the proficiency of oral English language, in terms of fluency and accuracy, is crucial in Hong Kong, but consistent preferred variants may not exist because of the controversy of systematic phonological patterns in the English pronunciation of Cantonese L2 speakers of English. Since English is the second language of Cantonese speakers in Hong Kong, general English proficiency instead of individual pronunciation is considered. English phonological variation in Hong Kong is not as consistent and stable as those found in other studies, such as in Norwich (Trudgill, 1972, 1974) or New York (Labov, 2006) in which English is the first language of the speakers.

Since women are capable of demonstrating their status in different ways in Hong Kong, gender is possibly not influential to the English pronunciation of Cantonese speakers in Hong Kong. Besides, the background and language experience of the participants are so diverse that other extralinguistic factors may outweigh the effect of gender.

5.3.2 Age

Similar to gender, age was not significant for all types of English production. Three age groups, including 20-30, 31-45, and 46-60, were targeted in the factor group of age. The descriptive statistics show that the age groups of 20-30 and 46-60 had the same accuracy rate at 85.2%, and the accuracy rate of the age group 31-45 was only 6.7% lower than that of another two subgroups (see Table 4.2). Although the productions by the age group of 31-45 were modified the most frequently at 14.7%, the difference among the three subgroups was not great because only 11.2% and 9.8% of the production in the age group of 20-30 and 46-60 were modified. The deletion rates of the subgroups did not differ widely, with only 3.1% variation. Based on the descriptive statistics, it is not surprising that age was not found to be significant in all types of production in the VARBRUL statistics (see Table 4.21). Age was not a significant factor for the three types of production was possibly due to the slight variation among the subgroups. This finding is supported by other studies (Dewaele, 2004; Labov, 1972; Romaine, 1978) which report that age has little or no effect on linguistic variation. Hence, age may not play an important role in the production of 15 English consonants by Cantonese speakers of English.

Although it was reported that young speakers are linguistic innovators while older speakers were relatively resistant to change (Labov, 1972), Cantonese L2 speakers of English in various age groups in Hong Kong behaved in a different way as the participants in the three age groups performed similarly in each type of English production.

Due to the British colonization, it may be argued that older Cantonese speakers of English may speak better English, in terms of accuracy, fluency, grammar, and vocabulary, than the young speakers in Hong Kong. Since Hong Kong was a British colony from 1898 to 1997, English was the only official language in Hong Kong. Bolton (2000) discussed the sociolinguistics of Hong Kong and stated that:

> "the English language had the status of the official language of government, the official language of law, and was de facto the most widely-used medium of secondary and university education. Its functions included its use as an official language, its use in education, its use in industry, trade, business, finance, and communications." (p. 270)

Chinese was not recognized as a co-official language along with English across different sectors until the establishment of the Official Languages Ordinance of 1974 (Bolton, 2000). It was expected that the Cantonese speakers of English in the age group of 30-45 and 46-60 seemingly would have more opportunities to listen to and speak English in schools or later at work, and so their English pronunciation should have been better than the speakers in the age group of 20-30 and 31-45. However, the government adopted a *lasissez-faire* approach for the individual school principals to implement the medium of teaching in their schools from 1974. Such policy led to a failure of the implementation of either CMI or EMI secondary schools. Despite English being the official language in Hong Kong, the English language achievement of the older generations was principally contingent upon the school they attended. The English-medium system continued in the early 1990s as a continuum because the teaching medium of prestigious secondary schools was English while that of the lowest ranking schools were Cantonese; yet, the extensive use of a 'mixed code' practice of teaching was common in a majority of schools which lied between EMI and CMI schools. Nevertheless, a number of participants in different age groups studying in EMI schools explained in the interview that although lessons were required to be taught in English in EMI schools, Cantonese was the primary language only when it came to lecturing. Consequently, not only the younger speakers, including those who had studied in EMI schools across the period of the handover of 1997, but also the older speakers who attended secondary schools during the British colonization might lack a fundamental way to improve their English pronunciation as a result of the ineffective language policy implemented by the government in secondary education. Therefore, it was more plausible that the educational background of Cantonese L2 speakers of English or the elite schools the speakers attended (refer to Section 5.3.3) instead of the period that they received their primary and secondary education has a greater influence on their English pronunciation.

As discussed in the section of gender, the effect of other extralinguistic factors, such as frequency of oral English language use , personal experiences, and educational background, possibly overrides that of age. This is illustrated with the backgrounds of two participants who are Frank (pseudonym), a banker, and Ian (pseudonym), a doctor, in the age group of 20-30 and 46-60 respectively. Both participants stated that they speak with a British accent and their frequency of oral English language use is intermediate. They had a very high accuracy of English consonant production, Frank with 96.5% accuracy and Ian with 100% accuracy, and they were also taught the pronunciation of English vowels and consonants at school. The main difference between them is the duration of stay in an English-speaking country. Frank stayed in England for five years for high school and university studies, so it is possible for him to speak with a British accent. However, Ian did not stay in any English-speaking countries for a long period of time but in Britain for a month only. Compared with Frank, Ian had fewer opportunities to speak English but he is still capable of pronouncing the English consonants accurately with a British accent. He responded that he deliberately tried all the time to discard the Hong Kong accent and he was still listening to the British Broadcasting Corporation (BBC) news for the improvement of his spoken English. His spoken English was also under the great influence by the professors and lecturers, who were all British speakers, when he went to the medical school. The examples demonstrate that age may not be a crucial factor for the English pronunciation by Cantonese speakers but attitude towards improving English pronunciation is essential. Five participants in the same age group of Ian admitted that their English pronunciation was not satisfactory in the interviews as they described their pronunciation as "fair", "not good", or "average". Interestingly, they had a desire of improving their English pronunciation but all of them replied that it was difficult for them to improve their English pronunciation because of their age, ability, and limited time.

Besides frequency of oral English language use and educational background, attitude towards better English pronunciation plays a critical role in affecting the production of English consonants by Cantonese speakers.

5.3.3 Social Class

Among the 47 participants, 26 participants were categorized as the lower middle class and 21 participants as the upper middle class. Based on the VARBRUL statistics, social class was the only social factor found to be significant for accurate production, feature change, and deletion while gender and age were not significant factors affecting the production of English consonants by Cantonese speakers. The upper middle class (UMC) participants had 87.8% accurate production, which was 8.9% higher than the lower middle class (LMC) participants (see Table 4.2). In other words, the LMC participants modified and deleted the target English consonants more than the UMC participants. Although the variation of the two groups in the three types of production was not great percentage-wise (see

Table 4.2), social class was found to be statistically significant for accurate production, feature change, and deletion. Due to the low degree of ranges (see Table 4.21), the effect of social class was not strong in the three types of production. Still, it was found that the upper middle class promoted accurate production over the lower middle class while the lower middle class favored feature change and deletion over the upper middle class. The findings imply that social class is possibly influential to the production of English consonants of Cantonese speakers, although it has a relatively weak effect. Therefore, the UMC Cantonese speakers are more likely to articulate English consonants more accurately than the LMC speakers. However, social class is not the sole factor which affects the English pronunciation of Cantonese speakers; it may be other factors relating to social class that play a role. Since educational background, family background, and occupation are the components of social class, these factors may have an influence on the English pronunciation of Cantonese speakers. As frequency of oral English language use was found to be significant for accurate production and feature change, it indicates that oral English language experience is vital for the English consonants production of Cantonese speakers. The data show that participants who speak English frequently are usually from the upper middle class, and those who speak English less frequently are mainly the LMC speakers.

Regarding the opinions obtained from the participants in Interview Question 7 (see Appendix D), 29 out of 47 participants agreed that Cantonese speakers' social status was reflected by their English pronunciation. They believed educational background, family background, occupation, and job position possibly influenced the English pronunciation of Cantonese speakers as they explained that Cantonese speakers having better English pronunciation were more likely to possess higher education level, a middle-class family background, or a more professional job.

From the responses in Interview Question 4 (see Appendix D), 10 participants stated that Cantonese speakers with higher education level pronounced English better than those who had lower education level because they possibly acquired more English at school. Yet, 22 participants expected that English proficiency is positively proportional to educational background instead of education level. They stated that English pronunciation was contingent on whether Cantonese speakers studied in prestigious primary and secondary schools, which are commonly EMI schools, as well as the subject they majored in university because such educational background of Cantonese speakers would offer them more or less opportunities to be exposed to accurate English pronunciation. Although it was uncertain that if the participants went to prestigious primary or secondary schools, 37 out of 47 participants, with 18 out of 21 UMC participants, attended EMI secondary schools.

Among the 37 participants, 14 (seven were from the upper middle class) declared that the EMI schools they attended facilitated their English pronunciation because they had opportunities to be exposed to oral English.

The effect of educational background of the Cantonese speakers on English pronunciation is illustrated by the case of four participants. Ian, a participant in the age group of 46-60, replied that he started to speak English at a tender age when he studied in an EMI school. He stated that "even in the history lessons, we had to be doing stimulation in core exercises, [there were] lawyers and judges talking in English about Medieval Time. So, that was the time when we really had a lot of experience [in speaking and listening to English]." He added that the British professors in his medical school had a great influence on his British accent. This shows that Ian's educational background undoubtedly accounts for his accurate English pronunciation. Ann (pseudonym), another participant in the age group of 46-60 produced the tokens with 95.6% accuracy, pursued her postgraduate studies in the United Kingdom for a year. She lived in Canada for 22 years from the age of twenty and moved back to Hong Kong. She responded that the EMI secondary school she attended emphasized oral English language use because there was an English-speaking day every Monday, and nobody could speak Cantonese on that day or they would be penalized. Speaking English compulsorily at least one out of five days every week was very beneficial to her English pronunciation. The illustrations of the two participants reveal that the schools Cantonese speakers attend may be influential to their English pronunciation if oral English language use is focused on in teaching as well as in the school environment. Both participants are categorized as the UMC speakers in this study since Ian is a doctor and Ann is a merchandising director with monthly salary over $40,000. Not only are they classified as the UMC participants due to their occupation, job position, and salary income, but also their education backgrounds and life experiences show that they are likely from middle-class family backgrounds.

Although Raul (pseudonym), who had 52.3% of accurate production, and Macy (pseudonym), who produced 30% of accurate production, are in the same age group as Ian and Ann, their educational background and exposure to oral English is different. Raul and Mary, who were both categorized as the LMC participants, graduated from secondary school and they are infrequent users of oral English. Their education in secondary school reveals that they had a lack of exposure to oral English. Raul stated that the teaching method in his secondary school was traditional without interactive and communicative teaching but only drilling, so he could merely follow or imitate the teacher to speak English. Macy had a similar experience that she studied in a CMI secondary school which did not provide her any opportunities to speak English, and grammar teaching was the focus at that time. Compared with Ian and Ann, the educational background of Raul and Macy did not allow them to be exposed to oral English as they rarely immersed in an English-speaking environment; thus, the lack of practice in English speaking may hinder their English pronunciation. Moreover, their educational background and level may reveal that they were not born and raised in middle-class families, which in turn may influence their career development, and hence social status.

Since English is regarded as a prestigious language in Hong Kong, English teaching is emphasized in elite schools. Parents in Hong Kong also tend to consider that students from the middle-class or UMC background are more likely to study in elite EMI schools (Bolton, 2000), which possibly offer more opportunities for students to speak and listen to accurate English pronunciation compared to the general EMI schools in which the teaching medium is Cantonese and English. Lai (2010) also stated that the majority of students in elite EMI schools came from better-off middle-class families.

In Hong Kong, everyone should have an equal right to receive education, and it was found that the relationship between socioeconomic status (SES) of students and the quality of education they received was not apparent (Siu, 1988). However, Siu (1988) speculates that students from higher socioeconomic backgrounds have a higher likelihood to be admitted into the elite schools due to the admission system in Hong Kong. The Primary One Admission Scheme introduced in 1983 allows the prestigious schools to favor students from middle-class families for the preservation of their elite status. Once the students were admitted to elite primary schools, it was highly possible for them to be admitted to the secondary schools in a comparable ranking. With reference to Ng's study (2000), there is a strong correlation between social class and education in Hong Kong because "upper middle class people have advantages in choosing high SES schools for their children due to their being capable of having special connection with these schools and the cultural capital they enjoy in their social stratum" (p. 45). Cultural capital refers to family advantages in which the cultural experiences of students would facilitate students' academic performance. Consequently, middle-class students in the prestigious schools do not only have more opportunities to use English in terms of speaking, listening, reading, and writing, but could also receive better education or acquire standard English in these elite schools as the prestigious schools prefer the best qualified teachers who are able to reinforce students learning as well as English language proficiency. In other words, social class is likely to affect Cantonese speakers' education background, which in turn may be influential to their English pronunciation. Being born in higher socioeconomic families, and thus having a better chance to attend elite schools and receive a high quality of education may lead to the Cantonese speakers to be able to speak with accurate and fluent English as well as to increase the likelihood to pursue to a higher ranking at work. A cyclical phenomenon results because Cantonese speakers' possessing better educational and family background leads to higher English proficiency, including English pronunciation, which enables them to obtain a high-rank and well-paid job that can help maintain or upgrade their social class.

In terms of family background relating to frequency of oral English language use, not only the educational background of Cantonese speakers, but also social network, language attitudes, occupation, and job position vary widely in different social classes. There were 37 participants stating that Cantonese speakers who were raised in middle-class families were more likely to have accurate English pronunciation compared with the LMC speakers who possibly had less frequent oral English language use in daily life. First, they pointed out that if parents are able to communicate with the children in English, the children would be able to acquire better English pronunciation at their young age, provided that the English pronunciation of the parents is standard or close to standard. This is supported by the finding of Lai's (2010) study, which investigated the relation between social class and language attitudes of the secondary school students in Hong Kong. Lai report that there are three major advantages for the middle-class group to have closer social distance with English speakers. One of the advantages is stronger parental influence and support for the students in English learning since all of the middle-class parents in her study "had attained senior secondary school education level or above, nearly all of them could speak English" (Lai, 2010, p. 94). Despite not all middle-class parents being able to assist their children in person, middle-class families may facilitate children's English learning in different ways. Participants in the current study responded to Question 4 in the interview and they believed that affluent families were capable of supporting their children in the development of their English proficiency by 1) hiring private tutors to teach them English; 2) employing a domestic helper, usually a Filipino maid, who could look after the children as well as communicate with them in English; and 3) sending them to study abroad, especially in an English-speaking country, such as England, Australia, and the United States, where students were immersed in an English-speaking environment. Hence, Cantonese speakers raised in better-off families with more oral English language exposure and resources for English pronunciation training possibly may develop better English pronunciation. It is also supported by Berstein's (1961, as cited in Robinson, 2001) study that the academic achievement of the students from families of semiskilled or unskilled workers in England is shown to be greatly lower than that of skilled and white-collar workers due to their less life chances of job expectations, housing, health, and longevity. The finding implies that the lack of assistance from the lower-class family may lead to lower school achievement of the students.

As mentioned in Section 5.3.1, social networks, as suggested by Milroy and Milroy (1978) may be applied in the Hong Kong context in relation to social class and the contact of Cantonese speakers with English speakers. Family background, in fact, plays a crucial role in constructing the social network of a speaker. Gibbons (1984) stated that students of the elite schools achieved better English language proficiency because "they were socially close to the English-speaking group and viewed them essentially as political and social equals" (as cited in Lai, 2010, p. 86). In addition, the close social distance of the UMC families with English speakers can be established through intermarriage between the Hongkongers and English speakers, attending the same churches, sharing the same clubs, or living in the same areas (Siu, 1988). In contrast, people from the lower middle or lower class perceive an unequal power relationship with English speakers, Western experts working in the government or multinational companies, and the English-speaking groups are not reachable for them; thus, the social contact between the two groups is distant. Gibbons (1984, as cited in Lee, 1997) point out that direct social contact is a very powerful variable for second language acquisition, so students of working class and lower-middle class have a higher likelihood to encounter failure in learning English due to lack of the social contact with English speakers.

The effect of social class on accurate production, feature change, and deletion of English consonants could be analyzed with the concept of social network regarding social class (Milroy & Milroy, 1992). According to Milroy and Milroy (1992), both loose ties and strong ties of social network can be structured in the life of high professional or managerial employee. On one hand, high social and geographical mobility leads to loose ties when the middle-class or upper-class people pursue their careers. On the other hand, they have a socially close connection in their personal network. The weak ties or extension of social network ensure the dominance of legitimized linguistic code which is influential in a community while the strong ties of their personal network strengthed their resistance to language change.

In the Hong Kong context, if the social network of the UMC Cantonese speakers is tightly connected with the same group of friends, family members, or colleagues who are English speakers with accurate pronunciation, that group of Cantonese speakers are likely to have more accurate English pronunciation than the LMC speakers who lack oral English exposure. Hence, strong ties of social network of the UMC speakers can be norm-enforcing. Still, their weak ties of network, such as their connection with business partners or clients, and extensive travel experience in English-speaking countries, allow them to be exposed to oral English language use and to speak accurate English, which may reflect their social class at the same time. In contrast, the LMC speakers are more likely to have strong ties of social network with Cantonese speakers who hardly speak English in their daily life. This kind of social contact may cause frequent phonological variation in English due to the Cantonese speakers' lack of connection with English speakers, thus less exposure to oral English or accurate English pronunciation. Such strong ties of social network of the LMC speakers with other Cantonese speakers would ultimately lead to linguistic innovation. In this study, 7 out of 11 participants who have frequent oral English language use are the UMC speakers. Among these seven UMC participants, three of them have both strong and loose ties of social network as described above since they often speak English at home, with friends, and at work while the rest mainly speak English at work, in which loose ties of social network are constructed. Among all of the 21 UMC participants, only five of them speak English infrequently. Regarding the LMC participants, 15 out of 26 participants hardly speak English while only four speak English frequently. These 15 participants (see Appendix C, Question 8 of Part C) stated that they rarely had any opportunities to speak English unless they traveled to other foreign countries, met the foreign tourists asking for direction on the street, or occasionally at work with clients who could not speak Cantonese or Mandarin. The distribution indicates that the UMC speakers in Hong Kong possibly have a closer social distance with English speakers than the LMC speakers who lack the ways to connect with English speakers.

The distinct linguistic behaviors of the UMC and the LMC speakers are illustrated by the cases of two participants. Their oral language experiences are possible explanation for the English pronunciation of Cantonese speakers from different social classes, but they are not necessarily representative of other speakers who come from these backgrounds. Zoe (pseudonym), a manager of management consultant, is categorized into the upper-middle class. She has frequent use of oral English and had 95.6% accuracy in the production of English consonants. Besides Cantonese, she often speaks English with her children, other family members, and the domestic helper at home. In addition, Zoe has a number of friends who are from different parts of the world that she has to communicate in English with. Out of the immediate social circle with family members and friends, she also has to speak English at work with her colleagues and business partners or clients. Due to her social status, which allows her to establish a closer social distance with English speakers, there are strong social networks that enforce her accurate English pronunciation. In comparison, Raul, who was in the same age group as Zoe, is an insurance booker and classified as a LMC participant. He speaks English infrequently in his daily life and his production accuracy was 52.3%, which is one of the lowest among all the participants. Cantonese is the primary language he speaks with family member, friends, as well as at work. Raul rarely speaks English unless he travels to foreign countries. In this study, more than half of the LMC participants hardly speak English in their daily life and their oral English language experiences are similar to Raul's. Therefore, it is possible that strong ties of social network with Cantonese speakers hinder the English pronunciation of Cantonese speakers as they lack opportunities to be exposed to oral English.

As discussed in educational and family background, it is clear that Cantonese speakers from middle-class families are more likely to be provided with more opportunities and resources to speak and listen to English because of their extensive exposure to oral English language use; therefore, it is not surprising that the UMC Cantonese speakers of English are more associated with standard or accurate English pronunciation. Not only is the middle-class background of the speakers, but also the UMC speakers' language attitudes, advantageous to their English pronunciation. From the responses of participants in Interview Question 7 (see Appendix D), there were 30 out of 47 participants agreed that Cantonese speakers' social status could be reflected by their English pronunciation. Around 76% of the UMC participants, 16 out of 21, while around 54% of the LMC participants, 14 out of 26, agreed with this statement. They believe that the English pronunciation of Cantonese speakers reveals their family and educational background; yet, they added that English pronunciation is an essential but not the only indication of Cantonese speakers' social class. If the UMC participants consider English pronunciation as an important indication for reflecting the social class of Cantonese speakers, they incline to perceive the social class of other Cantonese speakers or be perceived by other speakers with English pronunciation. That means the UMC Cantonese speakers are more aware of their English pronunciation because they are aware of how others view them. In Hong Kong, accurate English pronunciation with less Hong Kong accent implies good English pronunciation and proficiency, so it is different from the symbolic prestige variants in places, for example, /r/ is the prestige form in New York City. Still, better or accurate English pronunciation of the UMC than the LMC participants of Cantonese speakers is supported by the studies (Irwin & Nagy, 2007; Labov, 1972; Levy, 2010; Rehner & Mougeon, 1999; Rehner et al., 2003) which show that prestige or standard variants is favored by the UMC or the upper class speakers. Compared with the LMC Cantonese speakers, the UMC speakers are more likely to be conscious of their social class or social status.

There are other possible explanations for the attitude of middle-class or the UMC Cantonese speakers having better English pronunciation. Lai (2010) found that the middle-class students, compared with the working-class and the LMC students, were more positively inclined to English. Their positive attitude towards English may be accounted for by their close social distance with English speakers. Due to stronger parental influence and support, middle-class students aspire to learn and use the English language. The assistance of private tutors to their development of English proficiency also foster the enjoyable feeling of students when they learn English. The frequent oral English use reinforces the role of English in the students' life, and thus English language becomes more familiar to them. More importantly, Lai's study (2010) emphasizes that the middle-class groups perceive English is symbolic of Hong Kong identity as the language implies "trendiness and Westernization" (p, 98) and they consider that fluent English speakers are generally educated, intelligent, and affluent. This perception reinforces students' desire to pursue a professional career, which requires a high level of English proficiency. With reference to the previous studies (Elliott, 1995a; Elliott, 1995b; Lori & Al-Ansari, 2001; Purcell & Suter, 1980; Suter, 1976), language attitude and L2 pronunciation are positively related as the higher consciousness of L2 pronunciation result in less degree of L2 foreign accent and better pronunciation. Social class possibly has a positive effect on the language attitudes of Cantonese speakers towards English language, and language attitudes may influence speakers' L2 pronunciation. Therefore, it is likely that social class is influential to English pronunciation of Cantonese speakers in Hong Kong.

Moreover, better English pronunciation seemingly implies that Cantonese speakers are likely to have a well-paid job in a higher position because English proficiency is a crucial criterion for obtaining a desirable job. Although a higher proficiency level of English may not guarantee a better or a well-paid job in Hong Kong, Hong Kong people with a low level of English proficiency tend to come across more difficulties in acquiring a well-paid job. Regarding the English proficiency of Hong Kong people, Cantonese speakers who are able to speak English fluently and accurately are likely to have higher English proficiency in other aspects, such as grammar, reading, writing, and listening. However, speakers who have high English proficiency in other aspects may not be able to pronounce English sounds correctly. Speakers with higher English proficiency would be capable of constructing more complicated sentences, acquiring a larger vocabulary inventory, and understanding English speech. Evans and Green (2007) investigated English language problems, including writing, reading, listening, and speaking, encountered by Cantonese speakers at an English-medium university in Hong Kong. They found that the main difficulties for the students were academic writing and speaking. Among all the difficulties in four language skills, speaking accurately (grammar) was considered to be difficult by almost 60% of the students. 40% of the students expressed that speaking clearly (pronunciation) was difficult. For reading and writing, vocabulary, style, and grammar were challenging to the students since more than 45% of the students found them difficult. In fact, grammatical accuracy was generally considered to be problematic in writing, reading, and speaking by students.

These results indicate that university students in Hong Kong are probably not able to speak English accurately and fluently if they experience problems in grammar because they are possibly not capable of dealing with the formation of sentence pattern, expression of ideas, and accurate pronunciation simultaneously. As suggested by Sato (1985), more attention is not only paid to language form, but also to "other demands on real-time discourse production: recall and encoding of rhetorical structure, lexical items, clause sequencing, etc." (p. 195). Hence, the less attention paid to pronunciation may affect the English pronunciation of Cantonese speakers. Such difficulty is illustrated with the case of Rex (pseudonym), who is a lawyer specialized in Chinese Law and hardly has any exposure to English in writing, reading, listening, and speaking. Even though Rex is a lawyer, a professional occupation, he is considered as the lower middle class speaker since he was an employee in a law firm without a high-rank position or a high income salary. He emphasized that he failed to handle grammar structure and vocabulary when he spoke English. As a result, despite his awareness of his unsatisfactory pronunciation, he merely attempts to express the meaning of the message he intends to convey. The lower social status of Rex could be possibly traced back to his educational and family backgrounds which did not offer him an English-speaking environment for better development of his English pronunciation.

Cantonese speakers who can speak fluent and accurate English are likely to have higher English language proficiency, but not vice versa. Since Cantonese speakers in Hong Kong with better English pronunciation tend to have a higher English proficiency, they are more likely to have a higher chance to be promoted to a higher position at work. Inversely, poor English pronunciation plausibly implies low English language proficiency of a speaker, and they would be less likely to be engaged in professional careers with high-rank and salary income, which require high levels of English proficiency. Therefore, English pronunciation may be an indication for the social class of Cantonese speakers. This demonstrates the possible reasons for the upper middle class promoting accurate production over the lower middle class while the lower middle class favoring feature change and deletion of the English consonants over the upper middle class.

5.4 Research Question 2

What is the effect of the frequency of oral English language use at home, at work, and with friends on accurate production, feature change, and deletion?

In this study, frequency of oral English language use was categorized as frequent, intermediate, and infrequent. All the 47 participants self-evaluated their frequency of oral English based on their language experience in daily life. The questionnaire shows that 20 participants spoke English infrequently, 16 participants had an intermediate oral English use, and 11 participants were frequent English speakers. Among the three groups, frequent English speakers had the highest accuracy, 90.5%, but the lowest rates of feature change and deletion of the production of English consonants while infrequent English speakers had the lowest accuracy with 76.9% but the highest rates of feature change and deletion (see Table 4.2). The VARBRUL statistics demonstrate that frequency of oral English language use is significant for accurate production and feature change, but not deletion. Frequent oral English use (p^i .639) favored accurate production over intermediate and infrequent use (p^i .456) In return, intermediate and infrequent use (p^i .545) promoted frequent oral English use (p^i .360) over feature change (see Table 4.21).

Due to the small ranges in accurate production (.183) and feature change (.185), the effect of the frequency of English language use was not strong on the two types of production. Yet, the range of the frequency of English use in feature change was the greatest among the factors which were found to be significant. Moreover, the same effect of intermediate and infrequent oral English use on accurate production and feature change may imply that if Cantonese speakers do not speak English frequently, there is no great difference between intermediate or infrequent oral English use in affecting the pronunciation of English consonants. The finding generally reveals that the more the frequent use of oral English, the higher the accuracy of English consonants by Cantonese speakers. It conforms to the results of the previous studies (Dewaele, 2004; Mougeon & Rehner; 2001; Mougeon et al, 2003; Rehner & Mougeon, 1999; Suter, 1976) which found that the frequency of the L2 use had a significant effect on second language variation, and it means the more the use of L2, the more that target production can be achieved. The effect of frequent use of oral English on accurate production and feature change indicates that "practice makes perfect." More opportunities to speak English does not necessarily lead to better English pronunciation, but Cantonese speakers who speak English frequently are more likely to improve their English pronunciation than those who do not have a chance to speak English.

In this study, Cantonese is the primary language that all participants use at home, with friends, or at work; yet, 11 participants had frequent oral English language use. Three of them claimed that Cantonese and English are the primary languages they spoke with their family members, friends, and at work. The rest replied that they spoke English frequently at work. In spite of the less or no use of oral English with family members and friends, eight participants considered themselves as frequent English speakers because the time at work, including the communication with coworkers, business clients or partners, could be as much as or even longer than that the time they communicate with their friends and family members. Therefore, their oral English language use can be regarded as frequent even though it is primarily used at work. The data collected from questionnaires of the 20 participants with infrequent oral English use reveals that Cantonese speakers in Hong Kong almost do not speak any English in their daily life since the primary language they use at home, with friends, and at work is Cantonese. For the 16 participants who are intermediate users of oral English, they may occasionally speak English at work, mostly with non-Chinese customers/clients or professors at university. However, the frequency of oral English use is low as the participants mainly communicate with their coworkers in Cantonese. Since the intermediate and infrequent speakers are lack of exposure to oral English use, it may be difficult for them to master grammar, vocabulary, sentence structure, and pronunciation simultaneously. As long as they are able to express themselves and communicate, they may not be aware of the pronunciation which does not greatly influence the meaning that they intend to convey.

In the study, 8 out of 36 intermediate and infrequent English speakers, which is around 22%, stated that they were not aware of their English pronunciation when they spoke English. There are reasons for their unawareness of English pronunciation, 1) communication is most essential and they only aimed at expressing themselves with the meaning they attempt to convey; 2) their jobs do not require them to speak good English; and 3) they want to speak naturally instead of being aware of their English pronunciation in an unnatural way. Compared with intermediate and infrequent English speakers, 2 out of 11 frequent English speakers, that is around 18%, responded that they were not aware of English pronunciation. Although the percentages of the speakers who are aware of English pronunciation in the two groups did not differ widely, the percentage of speakers with frequent oral English use was still higher than that of speakers with intermediate and infrequent oral English use. The findings suggests that frequent oral English use possibly lead to Cantonese speakers' higher awareness of English pronunciation and thus more accurate English pronunciation. This is supported by Purcell and Suter (1980) as well as Suter's (1976) study which report the strength of the speaker's concern about English pronunciation is the best predictor to be correlated with non-native English speakers since the more the speaker's concern about the English pronunciation, the more accurate the pronunciation tend to be. As discussed in Section 5.3.3 with the illustration of Rex, Cantonese speakers who have to pay attention to organizing grammar, sentence structure, vocabulary and so on are more likely to encounter difficulties in English pronunciation. Apart from the English language proficiency which is influential to English pronunciation of Cantonese speakers, the frequency of oral English use may also play a role because Cantonese speakers who do not speak English frequently are not likely to construct their utterances correctly, at the same time with accurate pronunciation. The discussion in educational and family background has shown that Cantonese speakers who are from the UMC with more opportunities to speak and listen to English would have better English pronunciation in general.

Cantonese speakers with frequent oral English language use do not only possess a higher awareness of English pronunciation, their occupation could have an effect on their English pronunciation. Apart from the three participants who speak English frequently with family members, friends, and coworkers, eight participants stated that they had frequent oral English use because of their job. The occupation and position of these participants include guest relations officer, tour guide, English language instructor, product sourcing manager, manager in banking, manager in management consultant, global sales and marketing manager, executive manager, merchandising director, clerk, and consultant. In the tourism industry, a high English level with good pronunciation is required for the staff, especially for those who have to communicate with visitors from all over the world. Hence, it is normal for the guest relations officer and tour guide to speak with accurate English pronunciation so that visitors can understand clearly. For the English language instructor, he undoubtedly has a high level of English proficiency as well as good English pronunciation so as to provide high-quality English teaching to the students. All the managers or director from various sectors stated that they had frequent contacts with clients or customers who could not speak Cantonese or Mandarin. Cantonese speakers at the managerial position possibly have a higher level of English proficiency because good language proficiency is a crucial criterion for the promotion in their career. Their accurate English pronunciation is one of the indications of a high level of English proficiency of Cantonese speakers, as discussed in the previous section. Not only do these participants have frequent oral English use at work, they are also categorized as the UMC speakers who have plentiful opportunities to speak and practice oral English. Consequently, the pronunciation of English consonants of Cantonese speakers who frequently speak English is more accurate or can be facilitated due to the speakers' higher awareness of English pronunciation, their occupation requirement, and social class.

As 'practice makes perfect', the opportunities of speaking English allow Cantonese speakers to practise more as well as improving their pronunciation. Suter's study (1976) demonstrates that the amount of conversation at home, at school, and at work in English with native English speakers is positively correlated with the English pronunciation of non-native speakers of English. The result implies that the more English is used by the L2 speakers with native English speakers, the more accurate the English pronunciation of L2 speakers tend to be. Other studies (Dewaele, 2004; Mougeon & Rehner; 2001; Mougeon et al., 2003; Regan, et al., 2009; Rehner & Mougeon, 1999) also reveal that L2 learners staying in the country of the target language has a positive effect on the acquisition of the variable of the target language because the frequency of French language use and the contact with the target language plays an important role in L2 variation. Regarding the participants with frequent oral English use, 8 out of 11 speakers have lived in English-speaking countries from 1.5 to 28 years for study or immigration, but only one participant declared that English was not the primary language she spoke in the country. However, there are only 7 out of 36 intermediate and infrequent speakers of English having lived in English-speaking countries from one to five years, and two of them replied that English was not the primary language they used throughout the years. This finding shows that the participants with frequent oral English use do not only speak English at their present daily life, but they have also immerged in an English-speaking environment for a long period of time and are experienced in communicating with the native English speakers in English. The background of these participants' staying in English-speaking countries is perhaps one of the reasons for their current occupation and position in which they are less likely to encounter difficulties in communicating with native English speakers or foreigners in English.

Oral English language use does not only imply English speaking but also listening as communication is mutual. Cantonese speakers who have more opportunities to speak English would have the same chance to listen to English. Therefore, the relationship between production and perception of English sounds can be taken into account as an effect on English pronunciation of Cantonese speakers whose frequency of oral English use varies. According to the findings of the previous studies (Chan, 2001; Flege, Bohn, & Jang, 1997; Flege, 1993; Sheldon & Strange, 1982), perception and production of English sounds by non-native speakers are highly correlated. Chan (2001) examined the perception and production of

English consonants by Cantonese speakers and found that they were positively correlated. She explain Cantonese speakers have acquired the complete Cantonese language inventory, so they possibly perceive the English sounds, which are not familiar to them, with the Cantonese sound system. As a result, they may have difficulties in distinguishing English consonants. Insufficient English-speaking environment of the intermediate and infrequent oral English users may hinder their production and perception of English sounds and less inaccurate English pronunciation could result. Macy, a participant with 30% accuracy in the production of the English consonants and speaking English infrequently, admitted that she failed to distinguish between the English consonant clusters, for example, /pl/ and /pr/, because she has not acquired the knowledge of their pronunciation. Without prior knowledge or awareness of the English pronunciation, it is possible that Cantonese speakers lack the ability of differentiating similar sounds in English and hence fail to pronounce them accurately. On the contrary, Cantonese speakers with frequent oral English use may have better perception and production that their English pronunciation is more accurate or is more likely to be improved. Nevertheless, further research regarding perception and production of English sounds by Cantonese speakers has to be conducted to confirm with this suggestion.

The above analysis reveals that frequent oral English use of Cantonese speakers promote accurate production of English consonants because more opportunities to be exposed to oral English allow Cantonese speakers to speak more English and give them a higher chance for improvement because they generally listen to the English pronunciation by native English speakers more than those who rarely communicate with English speakers. Additionally, frequent oral English use may indicate a higher level of English proficiency of Cantonese speakers who are more capable of speaking English naturally and without difficulties. This may be due to the occupations of these frequent speakers of English which require a high level of English proficiency and good pronunciation, as well as their experience of living in English-speaking countries. For the Cantonese speakers with intermediate and infrequent oral English use, it is possible that they lack English-speaking experience and some of them may fail to distinguish the English sounds in which they would modify the sounds to their closer counterparts. Hence, feature change was significantly affected by intermediate and infrequent oral English language use.

5.5 Research Question 3

How do the participants perform in different speech styles? Is speech style significant for accurate production, feature change, and deletion?

Three speech styles, including word list, passage reading, and conversation, were analyzed in this study. Participants performed similarly in all the three speech styles as the accuracy rates ranged from 82.8% to 84.6%, with passage reading the lowest and conversation the highest. Feature change occurred most frequently in passage and the least frequently in conversation but deletion of the consonants was the most common in conversation and the least common in word list (see Table 4.2). Not only did the descriptive statistics show a small difference among the three styles, the VARBRUL results also show that speech style was not a significant factor for accurate production, feature change, and deletion (see Table 4.21). Some previous research (Adamson & Regan, 1991; Bayley, 1996; Dickerson, 1975; Gatbonton, 1978; Labov, 1972; Schmidt, 1987; Tarone, 1982) has shown that speech style had a significant effect on linguistic variation because formal styles, for instance, minimal pair and word list, elicited more standard or target-like variants while less formal styles, such as natural conversation and interview, elicited more vernacular and less target-like variants. Attention paid to speech (Labov, 1972; Tarone, 1979, 1982) was proposed to be a critical reason for this stylistic variation. However, the results of the present study do not conform to the findings of the above research studies, but are supported by the studies by Beebe (1980), Major (2004), Lin (2001), and Sato (1985) as speech style was not found to be significant for the linguistic variation of non-native English speakers.

According to Labov (1972) and Tarone (1979, 1982), more attention would be paid by the speakers when styles shift to be more formal, so the formal styles should elicit more standard or target variants than the less formal styles. Although the accuracy rate of the target English consonants in word list was higher than that of passage, the difference was very small, with only 0.8%. The participants first read the two passages and then the word list, so they should be more familiar with the target words when they read the word list. However, as there were 125 words in the word list, it was possible that some participants did not pay the most attention to reading the list due to fatigue. Even though the words in word list were shown randomly, similar words, such as *glass* and *grass*, could cause confusion when the participants read all the words in a row. Besides, hypercorrection in the word list could be a potential reason for the similar performance of the two speech styles by the participants who seemingly performed less naturally in word list because great attention was required for pronouncing every word and over attention might be paid ultimately. Less accurate pronunciation could result in word list and thus its accuracy rate was similar to that of passage reading in which participants performed more naturally. In the conversational data, only limited target words could be elicited in the answers to a passage while the rest were the words which consisted of the target English consonants and with a particular linguistic environment.

However, most of them were common English words which are produced easily and relatively more accurately, such as *background*, *practice*, *native*, *correct*, and *clever*. As a result, it is not surprising that the conversational data yielded a higher accuracy than the word list and passage reading.

The accuracy rate was the highest in the conversational data, but interestingly it had the lowest rate of feature change and the highest rate of deletion. Fatigue or hypercorrection of the participants in word list could lead to more modification of the English consonants but not for deletion which happened most in conversation. When great attention was paid to reading the word list, it was more likely for the participants to replace a consonant with another one, for instance, /θ/ was replaced by /f/, instead of deleting it. In conversation, less attention was paid and more consonants were possibly deleted than in word list and reading passage. /v/, /θ/, /n/, /r/ were deleted most in the conversational data among all the singleton consonants while all consonant clusters, except /gl, gr/, were deleted most in conversation.

Although it was suggested that formality was an important factor for linguistic variation as more formal style would lead to more standard variants due to the amount of attention paid to it, other factors, such as fatigue or hypercorrection of the speakers, which possibly affect variation should be taken into consideration.

5.6 Research Question 4

Does linguistic environment (preceding front vowel, preceding back vowel, preceding diphthong, following front vowel, following back vowel, and following diphthong) and syllable/word position of a consonant affect accurate production, feature change, and deletion?

5.6.1 Linguistic Environment

Linguistic environment consisted of the effect of a preceding front vowel, a preceding back vowel, and a preceding diphthong in coda position, as well as the effect of a following front vowel, a following back vowel, and a following diphthong in onset position. Front vowels /ɪ e æ iː/, back vowels /ʊ ɒ uː ɔː ɑː/, and diphthongs /eɪ aɪ aʊ ɔʊ/ were taken into account. Linguistic environment was found to be a significant factor for accurate production, feature change, and deletion. The effect of a preceding front vowel on coda, a following front vowel, and a following back vowel on coda (p^i .639) favored accurate production over the effect of a preceding back vowel on coda and a following diphthong on onset (p^i .428). Among all types of vowels, the effect of a preceding diphthong on coda (p^i .313) was the least favorable in accurate production. Compared with other factor groups, linguistic environment had the strongest effect on accurate production. Contrary to accurate production, the effect of a preceding back vowel on coda and that of a diphthong on onset (p^i .565) favored feature change over the effect of a preceding front vowel and diphthong on coda, along with the effect of a following front and back vowel on onset (p^i .483). However, the effect was very weak, with the range of only .082. For deletion, the effect of a preceding diphthong on coda and the effect of a following back vowel on onset (p^i .743) promoted over the effect of a following diphthong on onset (p^i .618), followed by the effect of a preceding front, a preceding back vowel on coda, and the effect of a following front vowel on onset (p^i .385). The findings of the significant effect of linguistic environment on accurate production, feature change, and deletion are supported by the studies (Bayley, 1996; Hung, 2000; Young, 1988) about the English pronunciation of Mandarin and Cantonese L2 speakers of English because linguistic environment is also found to be significant for English variation in general. Since there was a lack of great effect on feature change, the discussion generally focuses on deletion of the target English consonants.

In general, the effect of a vowel which is more favorable to accurate production would be less favorable for feature change and deletion. The effect of a preceding front vowel on coda and the effect of a following front vowel on onset were more favorable to accurate production but less favorable to feature change and deletion (see Table 4.21). However, the effect of a following back vowel on onset was more favorable to accurate production, as well as deletion. It can be concluded that front vowels have a higher likelihood that they lead to more accurate production of consonants, regardless in onset or coda position. Back vowels and diphthongs possibly caused more difficulties for the participants as these linguistic environments were more influential for the feature change and deletion of the target English consonants. In feature change, the effect of linguistic environment was very weak because of the small range between the highest and the lowest VARBRUL weights. In addition, the VARBRUL weights were around .500, which indicates the effect of the factor group is neither very strong nor weak in the continuum. Based on the transcription data, the chance of the English consonants being replaced under different linguistic environments was similar. Due to the weak effect of linguistic environment in feature change, the reason for the more favorable effect of a preceding back vowel on coda and that of a following diphthong on onset is left unknown.

In deletion, the effect of a preceding diphthong on coda, along with the effect of a following back vowel and a following diphthong promoted deletion over the effect of other types of vowels. Regarding the effect of a preceding diphthong on coda in deletion, the consonant deleted was mainly the final /l/ and other singleton consonants were rarely deleted. Since the preceding vowel is primarily front or back vowel as designed in the target words, there were a low number of deleted final /l/ with a preceding diphthong and the word *real* /rɪəl/ accounted for the majority of it. As the data of this category was insufficient, it is necessary to have further investigation to explain the reason for the effect of a preceding diphthong on coda. For the deletion of consonants in onset position, consonant clusters, instead of singleton consonants, were deleted most frequently; hence, the deletion of consonant clusters was emphasized. The deletion has been analyzed from Section 4.2.3.2.1 to Section 4.2.3.2.4. Table 4.12 shows that /pr/ and /pl/ were deleted most while /bl/ and /gr/ were omitted the least. However, the deletion of /bl, br/ and /kl/ occurred in various linguistic environments, and /gr/ was mainly modified than deleted. Among all the clusters, /pl, pr/, /kr/, and /gl/ were deleted commonly when they had a following back vowel or following diphthong. Regarding /pl/ and /pr/, /l/ was frequently deleted in the words like *plot* /plɒt/ and *play* /pleɪ/, and /r/ was commonly omitted when it was followed by the back vowel /u:/ or the diphthong /oʊ/, for example, in *proof* /pru:f/ and *progress* /proʊ.gres/. Frequent deletion of /kr/ occurred when there was a following back vowel, such as /u:/ and /ɔ:/, and the data revealed that /r/ was more extensively deleted in *cruise* /kru:z/ and *crawl* /krɔ:l/ than in *crab* /kræb/ and *cream* /kri:m/. For /gl/, deletion happened most in the word *glory* /glɔ:.ri/, also with a following back vowel /ɔ:/, but it was pronounced correctly in words with a following front vowel, such as *glad* /glæd/ and *glance* /glæns/, or rarely deleted in *gleam* /gli:m/ and *neglect* /nɪ.glekt/. The transcription data demonstrate that a following back vowel was more likely to lead to deletion of consonant clusters in onset position than a following diphthong, and it may help explain the relatively stronger effect of a following back vowel than that of a following diphthong on onset position.

Compared with a following front vowel in consonant clusters, the closer place of articulation of the post-alveolar /r/ and a back vowel may cause the deletion of /r/ in consonant clusters. The articulation of /pr/ or /kr/ and a following back vowel, for instance, /u:/ and /ɔ:/, is so close that /r/ may be easily omitted by the participants for the ease of pronunciation in the consonant clusters. Nevertheless, /r/ in /gr/ was frequently replaced by /l/ or /w/ instead of being deleted. For the deletion of /l/ in the consonant clusters, it is possible that /pl/ was easier for the participants to articulate when it was followed by a following front vowel. Since the place of articulation of the alveolar /l/ is close to that of front vowels, the pronunciation of /pl/ and /gl/ with a front vowel, for instance, *please* /pli:z/, would be easier than that of /pl/ and /gl/ with a back vowel in which a larger movement from the front part to the back part of the oral cavity is required. Thus, /l/ is more likely to be deleted when it is followed by a back vowel. In addition, /g/ in /gl/ is a velar sound which is close to the articulation of a back vowel. Therefore, /l/ could be deleted easily as some Cantonese speakers may be inattentive in producing /l/ between /g/ and a back vowel, which are articulated with the back part of the oral cavity. Also, the difference of the standard pronunciation and that with /l/ deletion is not great, for example, *glory* /glɔ:.ri/ and /gɔ:.ri/ sound more similar than words with /gl/ and a front vowel like *gleam* /gli:m/ and /gi:m/; thus, some Cantonese speakers may be lazy to pronounce /l/ in the words with /gl/ and a back vowel.

5.6.2 Syllable/Word Position

Syllable/word position included syllable-onset and syllable-coda position in monosyllabic words as well as word-initial and word-medial position in disyllabic words. Similar to linguistic environment, syllable/word position was found to be significant for accurate production, feature change, and deletion (see Table 4.21). The results reveal that syllable-onset, word-initial and word-medial position favored accurate production over syllable-coda position. On the contrary, syllable-coda position promoted feature change over syllable-onset, word-initial and word-medial position. Syllable-coda position also had a more favorable effect on deletion over word-initial position while word-initial and word-medial position had the least favorable effect. Furthermore, the effect of syllable/word position was very strong because of the high range of .537. In general, syllable-coda position in monosyllabic words was likely to lead to less accurate production but more feature change and deletion of the English consonants. The finding will be discussed based on the Markedness Differential Hypothesis (MDH) (Eckman, 1977).

The MDH (Eckman, 1977) explains L2 learning in relation to the markedness of sounds in various positions in relation to L1 and L2. The MDH predicts the area of difficulties that language learners encounter in L2 learning and the level of difficulties. It suggests that the areas of L1 which are different from the L2 and more marked in the L2 are relatively more difficult. It posits the relative degree of difficulty in the L2 will correspond to the relative degree of markedness. Also, the areas of L1 that are different from the L2 but less marked in the L2 will not be difficult for learners. Regarding the positions of the consonants, Eckman (1977) suggest that a voice contrast exists word-finally implies a contrast word-medially, which implies a contrast word-initially. However, a voice contrast in initial position does not necessarily imply a contrast in medial or final position. Hence, word-initial position is the least marked while word-final position is the most marked. Cross-language studies (Flege & Davidian, 1984; Henly & Sheldon, 1986; Anderson, 1987, as cited in Stockman & Pluut, 1999; Yam, 2004) have shown that final consonants are more difficult to acquire than initial consonants, for instance, errors of consonant clusters are more common in syllable-final position than syllable-initial position by the Mandarin and Cantonese speakers of English (Anderson, 1987; Yam, 2004). The result of the present study confirm these findings as initial position, including syllable-onset and word-initial position, favored accurate production over final position, that is syllable-coda position. Compared with syllable-coda position, word-medial position is also less marked and participants had less difficulty in producing the English consonants in the word-medial position. Therefore, syllable-onset, word-initial, and word-medial positions are less marked and less difficult for the participants than syllable-coda position that consonants in initial and medial positions had a higher level of accuracy.

As word-final position is more marked than word-initial and word-medial positions, consonants in word-final position are relatively difficult for L2 speakers of English. In this study, all the seven singleton consonants /ſ, v, θ, ð, r, n, l/ appeared in syllable-onset, syllable-coda (except /r/), and word-medial positions while the consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/ appeared in syllable-onset, word-initial, and word-medial positions. As syllable-coda position is more marked and favors feature change over the other positions, singleton consonants which appeared in syllable-coda position were the most difficult sounds for the participants. The descriptive statistics show that /ð/, /v/, and /θ/ were the first three consonants being modified the most among all 15 consonants and they were most frequently replaced in the syllable-coda position compared with other positions. This is supported by Hansen's (2001) study which found that the favored production modification of single codas was feature change, which included changes of place and manner. The results also demonstrate that syllable-coda position is especially influential for particular consonants and /f/ was the most common substitute for these three consonants in the syllable-coda position. The replacement of /v/ by /f/ syllable-finally confirms prior research (Chan, 2007; Chan & Li, 2000; Hung, 2000) that the Cantonese speakers of English have a very strong tendency to devoice English voiced obstruents in word-final position and /f/ is commonly substituted for /v/ in word-final position. The dental fricatives /θ, ð/ are also replaced by /f/ word-finally as found by previous studies of the English pronunciation by Cantonese speakers (Bolton & Kwok, 1990; Chan, 2006a; Chan & Li, 2000; Deterding et al., 2008; Hung, 2000). For the voiceless labio-dental fricative /f/, it is not difficult for the participants even it appears in the syllable-final position. As explained by Chan (2007) and Hansen (2001), voiced obstruents are relatively more marked than voiceless obstruents which are less difficult for L2 speakers. Therefore, final /v/ yielded a lower accuracy than final /f/. Furthermore, the replacement of /v, θ, ð/ may account for the Cantonese transfer because these consonants do not exist in

Cantonese language inventory. Hence, some Cantonese speakers replace those consonants with the voiceless labio-dental /f/, which appears word-initially in Cantonese and its place of articulation is close to /v, θ, ð/. Regarding /n/ and /l/, these two sounds, particularly /l/, were deleted rather than replaced by another consonant in the syllable-final position.

Although only syllable-coda position had a more favorable effect on feature change, feature change of certain consonants in onset position is discussed in order to demonstrate the difficulties that Cantonese speakers may encounter. Among the target singleton consonants in onset position, participants were more likely to modify /v, θ, ð, r/, all of which do not appear in Cantonese. All consonants are voiceless in Cantonese so the voiced consonants in English are easily replaced by the voiceless counterpart. It has been reported that voiced fricatives are frequently devoiced by Cantonese speakers of English (Bolton & Kwok, 1990; Chan, 2007; Chan & Li, 2000; Eckman, 1981; Edge, 1991; Hung, 2000). When /v/ was modified by the participants, it was commonly replaced by /w/ in onset position and occasionally by its voiceless counterpart /f/ word-medially. This finding conforms to the studies (Bolton & Kwok, 1990; Chan & Li. 2000; Hung, 2000) which show that Cantonese speakers are likely to substitute /w/ for /v/ in syllable-initial position. The voiceless dental fricatives /θ/, as in syllable-coda position, was articulated as /f/ in other three positions while the voiced dental fricative /ð/ was often replaced by /d/ in syllable/word-initially and word-medially. Prior research studies (Bolton & Kwok, 1990; Chan & Li, 2000; Deterding et al., 2008; Hung, 2000) has shown similar findings regarding the dental fricatives /θ, ð/. Cantonese speakers may also have problems producing /r/ and replaced /r/ with /l/ or /w/ (Chan & Li, 2000; Hung, 2000). In the current study, participants primarily substituted /d/ for initial /r/ but /l/ was rarely used. Besides the four consonants above, /n/ and /l/ were also modified by some participants but the percentages were much lower than that of /v, θ, ð, r/. These two consonants were found to be the substitute for each other but the replacement of /n/ by /l/ was more frequent than that of /l/ by /n/. Even though it has been reported that /n/ and /l/ were often interchangeable or in free variation (Bolton & Kwok, 1990; Chan & Li, 2000; Hung, 2000), Wong and Setter (2002, as cited in Deterding et al., 2008) concluded that "use of [l] in place of [n] is rather more common than the inverse, probably as a result of influence from recent changes in Cantonese where [l] is increasingly used for words that traditionally began with [n]" (p. 160). Regarding the initial consonant clusters, clusters with /r/, including /gr/, /kr/,/br/, and /pr/, had a higher percentage of feature change than that of clusters with /l/ (see Table 4.3). All clusters with /r/ were replaced with /l/, so /pr, br, kr, gr/ were sometimes produced as /pl, bl, kl, gl/. Yet, /kr/ and /gr/ were mostly pronounced as /kw/ and /gw/ instead (details were shown in Section 4.2.3.2). The finding is supported by the studies of Chan (2006) and Deterding et al., (2008) that /l/ is the substitute for /r/ in initial consonant clusters. With reference to Chan (2006), /r/ and /l/ have been neutralized because they are substituted for each other in initial consonant clusters. However, the present study shows that feature change happened much more frequently in /r/ clusters which were replaced by /l/ while /l/ clusters rarely underwent feature change and was changed to /r/. Thus, it is doubtful to conclude whether neutralization of /r/ and /l/ exist in initial consonant clusters.

The result of deletion was similar to that of feature change because of the more favorable effect of syllable-coda position over syllable-onset, word-initial, and word-medial positions. Besides, syllable/word position was found to have a strong effect because the range of it was the highest among other significant factor groups. Yet, word-initial position in disyllabic words was less favorable than syllable-coda position but it promoted deletion over syllable-onset and word-medial position. The MDH (Eckman, 1977) suggests that consonants in word-final position are more marked than that of word-initial position, so it is not surprising that the participants encountered more difficulties in acquiring final consonants. Hence, syllable-coda position was favored both deletion and feature change over other positions. The more marked position may lead to less attention paid to the consonants in the word-final position than that of the word-initial and word-medial positions. Six singleton consonants /f, v, θ, ð, n, l/ appeared syllable-finally in the study, and it was discussed that /f/ had a high accuracy while /v, θ, ð/ were mainly replaced by /f/; thus, only /n/ and /l/ underwent deletion in the syllable-coda position. In fact, /n/ was rarely deleted by the participants in the syllable-coda position, and it was final /l/ which was deleted most. The descriptive results reveal that /l/ had the highest percentage of deletion, 22.9%, among all the 15 target consonants and the /l/ deletion only occurred in the syllable-coda position. It has been documented by previous studies (Bolton & Kwok, 1990; Chan, 2006a; Chan, 2007; Chan & Li, 2000; Deterding et al., 2008; Hung, 2000) that dark /l/ is deleted when there is a preceding back vowel, for instance, *call* /kɔːl/ was pronounced as /kɔː/ while vocalization, which means the use of a vowel, happens when there is a preceding front vowel, for example, *grill* /grɪl/ is produced as /grɪu/. Compared with final /n/, which also exists word-finally in Cantonese, final dark /l/ does not appear in Cantonese and thus is more difficult for Cantonese speakers who would frequently delete /l/ in the word-final position. Apart from the relatively more marked word-final position, it is possible that final consonants are modified or deleted more than initial and medial consonants because less attention was paid to the final consonants. Initial singleton consonants were not deleted because there must be a consonant in the words with the target consonants so they would be only substituted instead of deleted. Despite the higher rate of deletion of /l/ and /r/ in the consonant clusters than the singleton consonants in syllable-initial, word-initial and word-medial positions (see Table 4.3), these positions did not lead to a very high degree of consonant deletion overall. The details of the deletion of the consonant clusters have been discussed in Section 4.2.3.1 as well as the part of the effect of linguistic environment on deletion above.

Both linguistic environment and syllable/word position were significant for accurate production, feature change, and deletion of English consonants. Generally, the effect of syllable/word position can be explained based on the Markedness Differntial Hypothesis (Eckman, 1977) which predicts the areas and the degree of difficulty that L2 speakers may experience. Cantonese may also play a role in influencing the English pronunciation of Cantonese speakers due to the absence of /v, θ, ð, r/ in Cantonese. Cantonese speakers may attempt to pronounce the target sounds with the voiceless counterpart or the sounds with similar articulation.

5.7 Summary

The findings of the current study show that only social class was significant for accurate production, feature change, and deletion while gender, age, and speech style had no significant effect on any types of production. Besides, frequency of oral English language use was significant for accurate production and feature change. Both of the linguistic factors were found to be significant for all types of production and they generally had a stronger effect than the extralinguistic factors.

The finding of the effect of gender in the present study conforms to the previous research (Rehner & Mougeon, 1999; Dewaele, 2004; Purcell & Suter, 1980; Suter, 1976) which report that gender and linguistic variation are not correlated. Despite women's preference for standard variants because of their consciousness of social status (Chambers, 2009; Romaine, 1978; Trudgill, 1972, 1974) and linguistic insecurity (Labov, 2006; Adamson & Regan, 1991), English pronunciation is not the only way to reflect one's social status in Hong Kong and women in Hong Kong tend to strive for a higher social position with better education, work performance, and financial independency instead of using standard or prestige English variants. Since English is not the primary language spoken of the majority of Cantonese speakers in Hong Kong, the effect of other social or extralinguistic factors, such as frequency of oral English language use, family and educational background, on English phonological variation possibly outweigh the effect of gender.

Similar to the effect of gender, the effect of age may be also overridden by other extralinguistic factors, such as the frequency of speaking English, personal experiences, and educational background. It may be expected that the British colonization led to better English pronunciation of older Cantonese speakers of English than the young speakers in Hong Kong. However, the English language achievement of the older generations was possibly affected by the school they attended. Indeed, the frequency of oral English language use, educational background, and attitude towards English pronunciation may be more critical for the production of English consonants by Cantonese speakers.

Social class was an important factor for the English pronunciation of Cantonese speakers and the result implies that the higher the social class of a Cantonese speaker, the better the pronunciation which he or she has. Educational and family background may have a great influence on Cantonese speakers' English pronunciation because Cantonese speakers from middle-class families are more likely to be provided with more opportunities and resources to speak and listen to English. Due to their extensive exposure to oral English language use, the UMC Cantonese speakers of English are more associated with accurate English pronunciation. If the social network of the UMC Cantonese speakers is tightly connected with the group of friends, family members, or colleagues who are English speakers with accurate pronunciation, those speakers are likely to pronounce English more accurately than the LMC speakers who lack oral English exposure. Apart from the middle-class background, language attitudes of the speakers are influential in affecting their English pronunciation. If the UMC Cantonese speakers regard English pronunciation as an important indication of reflecting the social class, they are possibly more aware of their English pronunciation.

Besides social class, frequency of oral English language use was found to be significant and frequent use of oral English possibly led to more accurate pronunciation. Not only social class, but also occupation or job position of Cantonese speakers may also affect speakers' awareness of and attitudes to English pronunciation. Cantonese speakers with frequent oral English language use do not only possess a higher awareness of English pronunciation, their occupation could also have an effect on their English pronunciation because the participants who are required to speak English at work have plentiful opportunities to speak and practice oral English. As a result, the English pronunciation of Cantonese speakers who frequently speak English is more accurate or can be facilitated due to the speakers' higher awareness of English pronunciation, occupation, and social class. Cantonese speakers with frequent oral English use have more opportunities to be exposed to oral English and their English pronunciation could be enhanced because they generally listen to the English pronunciation by English speakers more than those who rarely communicate with English speakers. However, Cantonese speakers with intermediate and infrequent oral English use possibly lack English-speaking experience and thus some of them may fail to distinguish English consonants in which speakers may have confusion over the similar sounds. Lower ability of English sound perception may be a reason for the more favorable effect of intermediate and infrequent oral English language use on feature change.

Speech style was another factor which was not found to be significant for all types of production and the results conform to that of the studies by Beebe (1980), Major (2004), Lin (2001), and Sato (1985) since speech style was not significant linguistic variation of non-native English speakers. In spite of the importance of formality on linguistic variation with more attention paid to formal style, other factors, such as fatigue or hypercorrection of the speakers, should be considered for their effect on the performance of Cantonese speakers.

The two linguistic factors, linguistic environment and syllable/word position, were found to be significant for accurate production, feature change, and deletion of English consonants. In linguistic environment, the effect of a preceding front vowel on coda and the effect of a following front vowel on onset were more favorable to accurate production but less favorable to feature change and deletion. The effect of a following back vowel on onset was more favorable to accurate production, as well as deletion. In general, front vowels possibly lead to more accurate production of consonants, regardless in onset or coda position. On the contrary, back vowels and diphthongs might cause more difficulties in producing English consonants for Cantonese speakers as these linguistic environments were more influential for the feature change and deletion. Further research should be conducted to examine the reasons for the effect of linguistic environment on feature change. Still, this factor had a great influence on the deletion of consonant clusters in particular. Furthermore, the effect of syllable/word position is explained based on the Markedness Differntial Hypothesis (Eckman, 1977) which shows that word-coda position is more marked than word-initial and word-medial position, and hence consonants in coda position are more difficult for the Cantonese speakers of English. Cantonese transfer may also play a role in the English pronunciation of Cantonese speakers who encounter more difficulties in articulating /v, θ, ð, r/, which are absent in Cantonese.

Chapter 6

Conclusion

6.1 Introduction

The final chapter will aim at presenting the summary of the research, the pedagogical implication based on the findings of the research, the limitations of the study, as well as the suggestions for further research in English phonological variation of Cantonese speakers.

6.2 Summary of the Study

The present study examines the pronunciation of 15 English consonants by Cantonese L2 speakers of English from the sociolinguistic perspective. Among the demographic factors, only social class was found to be significant for accurate production, feature change, and deletion while gender and age were not significant for all types of production. Despite the weak effect of social class on the three types of production, the findings revealed that this factor is important for the English pronunciation of Cantonese speakers. The interrelationship of social class with family background, educational background, and frequency of oral English use of Cantonese speakers was shown to be crucial for better English pronunciation due to more exposure to oral English use. It is supported by the findings of the significant effect of oral English language use on accurate production and feature change because frequent use of oral English led to more accurate production and less feature change of the English consonants. The extralinguistic factor groups, including social class and the frequency of oral English language use, which were found to be significant, possibly play a more important role than speech style, which was not significant for any types of production. Finally, linguistic environment and syllable/word position had a relatively stronger effect on all three types of production. In general, the effect of a front vowel favored accurate production over other types of vowels while the effect of a back vowel and diphthong was more likely to lead to feature change and deletion of the English consonants. The results show that the participants encounter more difficulties in pronouncing the English consonants /v/, /θ/, /ð/, /r/ which do not appear in the Cantonese language inventory, but /f/ and /n/ were not found to be problematic because they also exist in Cantonese that Cantonese speakers were capable of articulating them. For /l/, the participants were able to articulate correctly in the onset position but they had a strong tendency to delete /l/ when it occurred syllable-finally. The deletion of /r/ or /l/ in the consonant clusters generally happened more frequently in /pl/, /pr/, /kr/, and /gl/ with a following back vowel or diphthong. Additionally, the Markedness Differential Hypothesis (Eckman, 1977) explains the reasons for the higher accuracy of the

English consonants in the syllable-initial and word-initial position which are less marked and less difficult compared with the more marked syllable-final position.

6.3 Pedagogical Implications

The present study reveals that certain extralinguistic factors, including social class and frequency of oral English language use, were significant for English pronunciation of Cantonese speakers. Within these two extralinguistic factors, English-speaking environment is the most crucial issue which should be taken into account because the higher accuracy of the upper middle class participants and the frequent use of oral English are due to the exposure of oral English of Cantonese speakers. This group of Cantonese speakers possibly comes from middle-class families and has higher-quality of educational background, which allows them to speak English frequently or to engage in an occupation which requires high level of English proficiency, particularly in oral English. As it is more common for the middle-class families than the lower middle class or lower class families to provide their children with an English-speaking environment, the middle-class background of Cantonese speakers is advantageous for better English pronunciation. Apart from the families, schools play a vital role in the English pronunciation of Cantonese speakers as the time that Cantonese speakers spend most on learning English is possibly during the school time. Therefore, students may also be able to speak better English even they are not from the middle class, provided that their schools offer sufficient opportunities for them to learn and practise.

Indeed, 17 participants stated that they did not receive any English pronunciation training in school but merely followed their teachers' pronunciation. Only five participants declared that they have learnt about English phonetics and phonology in university or language center. For the rest, they mainly learnt about phonics or simple English pronunciation in primary or secondary schools. Therefore, it is necessary for the schools in Hong Kong to emphasize English pronunciation along with other English skills. In fact, an integrative and communicative approach of pronunciation teaching (Burgess & Spencer, 2000; Chela-Flores, 2001) as well as the education and training of language teachers (Burgess & Spencer, 2000; Hung, 1993) are crucial in the pedagogical issues of English phonology. Tizzano (1997, as cited in Burgess & Spencer, 2000) pointed out that learners understands the importance of monitoring their progress of learning when learning pronunciation; yet, they expect the language teachers assist them by anticipating their problems and offering them learning strategies. Hence, professional training and education of pronunciation are important for language teachers.

In order to implement effective ways of pronunciation teaching in language courses, purposes of and difficulties in pronunciation teaching should be considered. Spencer's (1996, as cited in Burgess & Spencer, 2000) study examined the teaching of English phonological features through pronunciation practice in ESOL (English for Speakers of Other Languages) courses in the U.K. It was found that one of the difficulties of pronunciation teaching for teachers is students' confusion of perceiving and producing problematic sounds. The teachers stated that various phonological features were taught, for example, distinction between voiced and voiceless phonemes, consonant clusters, word stress, utterance stress, intonation, and so forth. The pronunciation teaching was also commonly integrated with other skills by the teachers. The findings of the study imply that pronunciation practice should be integrated with other skills, especially to strengthen the skills of listening and speaking, that is perception and production. Moreover, teachers consider the controlled practice of speaking is essential because attention can be paid to pronunciation.

Based on these findings, Burgess and Spencer (2000) suggested two levels of integration of pronunciation practice. At the lower level of integration, practice is integrated into a communicative way of language learning. Pronunciation practice can fit into speaking activities for production practice and listening activities for perception practice. The integration of pronunciation with reading and writing should be also taken into account. At the higher and broader level of integration, not only is pronunciation integrated with the above skills, but also with other aspects of language, such as discourse-grammar features and vocabulary. All practices should be designed as communicative tasks with meaningful use of language that occurs in authentic situations. Practice may begin with listening or reading sophisticated discourse which involves authentic features so that the learners' development of listening skills can be enhanced. Besides the meaning-focused and communicative listening, learners are able to have a productive practice of pronunciation through controlled speaking practice, for example, retelling of the story which they have listened. Since the features which were said have been established "through the use of the ideational framework to structure the reading/listening tasks" (Burgess & Spencer, 2000, p. 203), learners are able to practise how to speak and pronounce them. Controlled speaking is a pronunciation practice or drilling associated with meaningful discourse which assists learners to transform their pronunciation practice into their linguistic behavior in the reality. Production and perception practice with meaningful context possibly assists learners' phonological development.

Chela-Flores (2001) also suggested that aural-oral intelligibility should be focused and the related instruction with meaningful units should be taught from a beginner-level. Due to the interconnection of listening, speaking, and pronunciation, pronunciation can be integrated into different language activities. Traditionally, phonological features were first selected for teaching and they were explained explicitly by language teachers. Articulatory practice with the features occurred in words, phrases, or sentences were then provided. However, there would be problems in controlling the difficulty of vocabulary and grammar structures which were only suitable for learners at a certain level of proficiency. Instead, there is another method to integrate pronunciation teaching into language activities in other aspects. Unlike the conventional approach in which phonological features were first chosen, aural-oral activities should be conducted so that language teachers can observe the pronunciation problem encountered by learners and thus emphasize the particular phonological features. Chela-Flores pointed out that the integration of pronunciation with grammar structures and vocabulary can be mutually reinforcing when pronunciation is practised with grammar and vocabulary exercises in meaningful discourse. When learners understand the connection between meaningful aural-oral communication and pronunciation, activities, they would recognize the immediate need for pronunciation after the listening activities. This awareness possibly helps learners to pay more attention to pronunciation and improve it. Apart from other lexical, semantic, and syntactic structures which are often the main focus in second language acquisition, the integration of pronunciation may enhance the learning of various aspects, especially in listening and speaking.

Besides the importance of integration into activities with meaningful discourse, various phonological features can be repeated in the instruction process so as to strengthen learners' phonological development as well as lower their anxiety of acquiring new features before the mastery of the new features. Sufficient learning time would help learners to overcome the affective problems, such as a lack of empathy, related to second language acquisition (Guiora, 1972, as cited in Chela-Flores, 2001). Based on the findings of the 15 target singleton consonants and consonant clusters, perception and production activities may be given to learners since these activities allow learners and teachers to realize learners' pronunciation problems. As the present study reveals that Cantonese speakers may fail to produce /v/, /θ/, /ð/, /r/, and dark /l/, English words with these sounds may be introduced more in authentic discourse for listening, speaking, and pronunciation practice so that learners will be familiar with the sounds and thus produce them without difficulties. Such integration of pronunciation aids learners to practise pronunciation and to acquire the meaning of the vocabulary as well as the skill of reading. These activities should be provided in school from the primary-school level so that learners' awareness of English pronunciation may be raised early during the learning process. Although the social class of learners may influence their English pronunciation, the growth of sensitivity to English pronunciation possibly help learners who are even from the lower class to receive more opportunities in pronunciation training and thus improve their pronunciation.

As suggested above, integration of activities of English production and perception in other skills can be provided for students to improve their awareness as well as sensitivity to English sounds. Listening to the speech of native English speakers or being taught by native English teachers could also assist students' perception to English sounds. Yet, these suggestions are based on the premise that there should be an adequate number of high-quality and well-trained English teachers. Although it is not necessary to have teachers who are native English speakers, English teachers should receive the training of English phonetics and phonology as well as acquiring the knowledge of the contrast in Cantonese and English pronunciation and realize Cantonese speakers' difficulties of articulating certain English sounds or consonants as discussed in this study. Besides proposing the teaching approach of English pronunciation, Burgess and Spencer (2000) mentioned that intelligibility of speech, which is a crucial consideration for language learners, has to be focused on in teaching. Since the teacher's accent is likely to be the target for the language learners, it is important for the teacher to understand his or her own accent. Both native and non-native speakers who are English teachers may compare their own accent with the reference accent, such as RP, General American, or other well-described accents, so as to demonstrate learners the similarities and differences of various segmental features in the two accents. When language teachers and practitioners teach students the accurate English pronunciation with a reference accent at school and introduce them to the other varieties of English, students are more likely to be able to distinguish phonological variation of different English varieties, which in turn may facilitate their English pronunciation.

In Hong Kong, teachers who are not native English speakers should address the similarities and differences of their own accent and the reference accent during instruction. In addition, it is necessary for the teachers and practitioners to demonstrate the language system of Cantonese and English to the learners. Based on the Markedness Differential Hypothesis (MDH) (Eckman, 1987) which help compares the differences between the native and target languages and explain the relative degree of difficulty, teachers may explain a voice contrast occurs in word-initial, word-medial, and word-final position in English while there is no voice contrast in all positions in Cantonese. The MDH states that "those areas of the target language which differ from the native language and are more marked than the native language will be difficult" (Eckman, 1987, p. 61). Therefore, all the English voiced consonants which appear in all positions are more marked and difficult for Cantonese speakers. Also, /θ/, /ð/, /r/, and final /l/ do not appear in Cantonese and hence Cantonese speakers may have difficulties in acquiring these marked sounds as expected by the MDH. As Cantonese only allows single consonant in syllable-initial and syllable-final positions, consonant clusters in English are more marked and difficult for Cantonese speakers. When teachers are familiar with the sound systems of English and Cantonese, they may emphasize the pronunciation of those sounds so that learners can understand the actual pronunciations of the difficult sounds and have a higher awareness. As a result, they should be able to distinguish them and have less difficulty with English pronunciation in general.

Based on the findings of the effect of the two linguistic factors on the three types of English production, some pedagogical implications are presented so as to hopefully improve the teaching and learning of English consonants in Hong Kong. The significant results of the effect of linguistic environment generally show that a front vowel led to more accurate production but less feature change and deletion of the target consonants while a back vowel and a diphthong possibly caused more difficulties for the participants to produce particular consonants. Although the effect of a preceding back vowel on coda and that of a diphthong on onset favored feature change over the effect of a preceding front vowel and diphthong on coda, along with the effect of a following front and back vowel on onset, the weak effect of linguistic environment on feature change implies that there may not be a particular linguistic environment being more influential to the replacement of the consonants. However, the effect of a preceding diphthong on coda, along with the effect of a following back vowel and a following diphthong promoted deletion over the effect of other types of vowels. As discussed in Section 5.6.1, only the deletion of consonant clusters instead of singleton consonants in onset position was emphasized. Hence, language teachers and practitioners may focus on teaching the pronunciation of consonant clusters with a following back vowel and a following diphthong.

Among the eight consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/, /pl, pr/, /kr/, and /gl/ were deleted commonly when they were followed by a back vowel or a following diphthong. Since /r/ may be easily omitted for the case of pronunciation in the initial consonant clusters because of the close articulation of /pr/ or /kr/ with a following back vowel, such as, /u:/ and /ɔ:/, language teachers should emphasize the difference between /r/ and back vowels when they appear together. They may also first teach learners the pronunciation of the word without the initial consonant in clusters, for example the pronunciation of /ru:f/ in *proof* and /ru:z/ in *cruise*. When learners are able to master the pronunciation after a series of practice, the initial consonant, /p/ and /k/, could then be added to the sound of /ru:f/ and /ru:z/ respectively for further practice. This method may help the learners to arouse their awareness of articulating every single consonant in English words even though the pronunciation of a consonant and a following vowel is similar. For the pronunciation of /l/ in consonant clusters with a following back vowel and diphthong, the same method can be used to teacher the learners. Instead of only teaching the pronunciation of words like *plot* /plɒt/ and *play* /pleɪ/, which may be perceived as *pot* /pɒt/ and *pay* /peɪ/, a comparison of the words with similar pronunciation should be provided. Teachers and practitioners should pinpoint the difference between the pairs of English or coined words with and without /r/ and /l/ in the consonant clusters, for example, *play* and *pay*, so that English learners can pay attention to different pronunciations of the similar words. For the replacement of /r/ with /w/ or /l/ in the consonant clusters, such as /gr/ and /kr/, the teachers should focus on the pronunciation of /r/, regardless in singleton consonant or consonant clusters. The substitution of /w/ and /l/ for initial /r/, which is absent in Cantonese language inventory, is common in the English speech by Cantonese speakers. Hence, when the accurate pronunciation of initial /r/ is highlighted, English learners of English should not have any problem articulating /r/ in consonant clusters.

Despite the weak effect of linguistic environment on feature change, there is a relatively stronger effect of syllable/word position on it. Among the four positions, syllable-coda position had the most favorable effect on feature change. Compared with other singleton consonants, /v, θ, ð/ were replaced most frequently in the syllable-coda position and they were all substituted by /f/, which appears in Cantonese. Due to the absence of /v, θ, ð/ in Cantonese, English learners of Cantonese possibly pronounce the sound which is similar to these sounds and is easier to articulate, that is /f/. Hence, the teaching of the distinctive pronunciation of these four consonants is essential so that learners may acquire the ability to distinguish these consonants and thus pronounce them correctly. Regarding deletion, a strong effect of syllable/word position was found and syllable-coda position favored most in this type of production. Final /l/ was most commonly deleted in the syllable-coda position. In spite of the presence of initial /l/ in Cantonese, the English dark /l/ in the word-final position is absent in Cantonese. This consonant should be particularly emphasized in pronunciation teaching by demonstrating the difference between the words like *few* and *feel* in which the vocalization of /l/ often happens in the speech by Cantonese speakers. Learners should be instructed how to rise the back of the tongue to articulate the final /l/. Also, English learners may pay less attention to the pronunciation of the final consonants as the coda position is more marked than the onset position. Therefore, it is vital for the teachers and practitioners to emphasize the pronunciation of an individual consonant in every word position.

Besides teaching English pronunciation, schools should offer more opportunities for students to speak English, such as, English-speaking days, English debate, and English language speech competition. There should be sufficient practices for students after learning English pronunciation because there seem to be a lack of English-speaking environment for them if English is not spoken in their daily life.

The findings of this study will not only lead to some implications of language pedagogy, but also a future discussion of English pronunciation by Cantonese speakers of English.

6.4 Limitations of the Present Study

The present study investigates seven single consonants, /f, v, θ, ð, r, n, l/ and eight consonant clusters /pl, pr, bl, br, kl, kr, gl, gr/ from the sociolinguistic perspective. However, other consonant clusters which were found to be problematic for Cantonese speakers should be considered. Regarding to the research design, the number of participants engaged in this study may not be sufficient; yet, a larger pool of participants may generate more significant results in extralinguistic factor groups. Since participants were divided only into two classes, the upper-middle and the lower-middle class, the effect of social class was not shown to be very strong. Regarding to the data collection, there may not be adequate qualitative data to be considered in the analysis. As this is a more quantitative study, the general qualitative data were only used to support the quantitative findings but not analyzed in detail. Also, the questionnaire regarding oral English use and language attitude may be designed more comprehensively in order to understand more about the personal language experience of the participants.

The findings reveal that there may not be a very systematic pattern of English phonological variation by Cantonese speakers. Since Hong Kong is a heterogeneous community with the mixture of western and eastern cultures and people from diverse backgrounds have a great exposure to various kinds of experience, it is hard to find a systematic pattern of phonological variation. Still, the current study may contribute to the area of English pronunciation of Cantonese speakers, who may encounter difficulties pronouncing certain English consonants, from the sociolinguistic perspective which helps second language speakers and practitioners understand the influence from social factors.

6.5 Suggestions for Further Research

In future studies, more English consonants which were found to be difficult for Cantonese speakers and other two-member or three-member consonant clusters in both onset and coda position can be studied in detail so as to find out whether particular patterns of phonological variation may exist.

In order to generate a more representative finding of phonological variation, not only more participants should be invited to the study, but also more categories of social class can be comprised when there are an adequate number of participants and the people from the upper class are accessible. Although the opinions and background of the participants helped explain the English pronunciation of Cantonese speakers in the present study, more detailed information about participants, for instance, parents' occupation and detailed family background, may be obtained for in-depth analyses or case studies in further research. Since there is a lack of sociolinguistic studies on English pronunciation of Cantonese speakers, scholars may aim at conducting not only quantitative but also qualitative research which provides a comprehensive explanation for the English production of Cantonese speakers. Case studies may be also included as individual differences are crucial for phonological variation, especially in the Hong Kong context. Additionally, other extralinguistic factors which are particularly unique in Hong

Kong can be examined in the future, for example, the level of English proficiency, the educational background related to L2 English learning, and the exposure to English language.

In terms of pedagogical issues, research studies about perception and production of English consonants may be conducted so as to explore the English consonants which are difficult for Cantonese speakers to produce and perceive. To the extension of the study, particular consonants which are found to be difficult in production and perception tests may be focused in pronunciation instruction. An experiment may be carried out to find out whether the pronunciation practice and instruction presented in Section 6.3 help improve the English pronunciation of Cantonese speakers.

6.6 Conclusion

The present research will hopefully shed light on the phonology of English by Cantonese speakers in Hong Kong. As there is a lack of phonological study from a sociolinguistic perspective in Hong Kong context, the current study may shed the light on the area of English linguistic variation of Cantonese speakers in Hong Kong. As social class and frequency of oral English language use were found to be significant for accurate production, feature change, and deletion, the influence of educational and family background on Cantonese speakers' English pronunciation is considerable since Cantonese speakers from middle-class families could be provided with more opportunities and resources to use oral English. Although the personal background of Cantonese speakers varies, schools may take the initiation to assist students to be more exposed to aural and oral English with the integration of English pronunciation practice into other language activities in class. Furthermore, speech style was not found to have a significant effect on any types of production and this result may imply that the range of formality in the English production of Cantonese speakers is narrow. Although attention paid to speech (Labov, 1972; Tarone, 1979, 1982) was proposed to be a critical reason for stylistic variation, the English pronunciation of Cantonese speakers in various styles may be habitual and is not affected by the formality of style. Therefore, practicing English pronunciation in different styles may not be important but learners' involvement in communicative tasks in meaningful discourse would be more beneficial to their phonological development than reading English texts.

This research study also provides some pedagogical implications for English pronunciation teaching in Hong Kong. Not only is the integration of pronunciation practice into listening and speaking activities crucial, but also practices of English production and perception should be provided for learners in the instruction process.

Before the selection of phonological features in the instruction, it is necessary to conduct aural-oral activities to find out the features in which learners may have difficulty with acquiring them. With the communicative practices in meaningful discourse, the development of grammar and vocabulary aspects as well as the phonological development of learners can be possibly fostered. In fact, language teachers who are not native English speakers in Hong Kong should also focus on their own accent with the reference of Received Pronunciation or General American in pronunciation instruction. The effect of linguistic factors does not only help explain the English pronunciation of Cantonese speakers, but also suggests some ways of pronunciation teaching for language teachers and practitioners and arouses learners' awareness of particular consonants which are difficult for them. A study of phonological variation from a social perspective can possibly explain the accurate production, feature change, and deletion of English consonants by Cantonese speakers of English even though language transfer has been mostly found to play a role in English pronunciation.

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APPENDIX A

Word List

1. Monosyllabic words

	Front vowels		Back vowels	
	Onset	Coda	Onset	Coda
/f/	Fan Feel	Thief Leaf Cliff	Full Forth Fast	Roof Proof Cough
/v/	Vet Van	Live Grieve	Vase Vault	Groove Prove
/θ/	Thief Thin	Breath With	Thought Thorn	Fourth North
/ð/	This That	Breathe		
/r/	Real Ran	Year Care	Roar Roof	Roar Nor Car

	Front vowels		Back vowels	
	Onset	Coda	Onset	Coda
/n/	Need	Fan	Nor	Thorn
		Van	North	Noon
	Net	Thin	Noon	
		Ran		
		Plan		
		Clean		
/l/	Leaf	Feel	Look	Full
	Live	Real	Last	
	Lack	Grill		Crawl
/pr/	Press		Prove	
	Print		Proof	
/pl/	Plan		Plant	
	Please		Plot	
/br/	Breath		Broad	
	Breathe		Bruise	

	Front vowels		Back vowels	
	Onset	Coda	Onset	Coda
/bl/	black Bless		Block Bluc	
/kr/	Crab Cream		Crawl Cruisc	
/kl/	Cliff Clean Clap		Class Clock	
/gr/	Grill Grieve Grab		Groove Grass	
/gl/	Glad Gleam		Glass Glancc	

2. Disyllabic words

	Word-initial	Word-medial
/f/	Fifty Ferry	Coffee Perfect
/v/	Value Vanish	Cover Clever
/θ/	Thankful	Healthy Filthy
/ð/	Thousand Therefore	Weather Brother
/r/	Rapid Romance	Coral Parade
/n/	Neither Noodle	Canon Many
/l/	Layer Leader	believe Shallow

	Word-initial	Word-medial
/pr/	Problem Progress Precise	Surprise Deprive
/pl/	Plateau Platform	Complex Complete
/br/	Bracelet Brownie	Cobra Embrace
/bl/	Blanket Blockade	
/kr/	Credit Create	Increase Concrete
/kl/	Clothing Clever	Include Disclose
/gr/	Greedy Grandpa	Progress Regret
/gl/	Glamour Glory	Neglect

APPENDIX B

Reading Materials

1. Passage Reading

Passage 1

I'm Kathy and I **live** with my dog, Brownie. Brownie is my brother who I have to take **care** of. Although he **looks thin**, he has a balanced diet which keeps him healthy and away from the **vet**; yet, cup noodle is his favorite. He always keeps himself **clean** and glooms his hair after dinner. His glamour even attracts Bliss, a girl dog, in my neighborhood. He would neglect me when he **needs** Bliss to play with him. Brownie is a clever but a careless dog. He would **dare** fight with a **thief** and he caught a **thief** in our **vault last year**. Whenever he wants me to play with him, he is **glad** to go for a roll in the **grass** in the garden and **grab** his ball to me. **This** gets into a **groove** especially in nice weather. However, he may bump into **glass** and **bruise** his head because of his rapid run!

A clever dog is always naughty. Brownie has once broken my **blue vase** and **ran** away **fast** and vanished. He would tear his filthy blanket and even **ran** up to the **roof** of our house when he was young. He would **feel** innocent, take a deep **breath**, and just **glance** over when I **roar** at him.

I neither deprive his right to embrace nature **nor** a chance to enjoy a perfect trip. My grandpa is the leader in our home. When he comes, I drive them to the nearby beach **that** is **full** of surfers **with** my **van**. Sometimes, we even take a ferry to an island. We **need** to head to the **north** and pass by a plateau but once it took us three hours to there as there was a blockade for a parade! It does not help even we increase our speed! We normally arrive at **noon** and I would first **grab** a coffee and sunbathe. Brownie likes to **look** at a **crab** in shallow water and play with many other dogs. He may also stare at a coral as if he wants to **grieve** for the death of the **plant**. Grandpa and I like to **grill** some food and I would **clap** to call greedy Brownie to have some. Grandpa usually feels thirsty after having grilled food. Therefore, he prefers an ice-**cream** but he always ends up having a **cough**.

God **bless** me to have Brownie. I value him as a friend and I am thankful to the loyal **fan** who would disclose his heart to me. All credit to him, because there is no **lack** of happiness when being with him!

Passage 2

This is a com<u>plex</u> but funny **plot**. Kate always comes across adventures and this time it happened on a cruise on a **black** Friday. She actually did not have any **plan** to spend her vacation on a cruise but it was her friend, Bess, who asked her to go for a trip **last** week. **This** morning, she had a co<u>ffee</u> and a <u>brownie</u> for breakfast. When she **looked** at the **clock**, she knew that she had to rush to the pier by train. On the <u>plat</u>form, she took out a new <u>bra</u>celet that was made of **real** jade and planned to give it to Bess. Suddenly, a man **with broad** shoulders stood in front of her and she **thought** "**Please** go away and don't **block** my vision or I cannot see Bess". At **that** moment, Bess called and told Kate a staff from the **cruise** would come to take her since they were the first-**class** guests. Though she did not be<u>lieve</u> it, she could do nothing but follow him as she forgot to **print** out the map to the location. She requested the staff to show her a **proof** and they left. When they arrived at the pier, there was **press** reporting the first journey of the cruise named "Kason" and she was thrilled! Kate met Bess on board and their room was on the **fourth** floor.

After sailing for a night, the **cruise** stopped at a coast and they got off with their thick <u>clothing</u>. They headed to a **cliff** to take a com<u>plete</u> view of the sea and they could not wait to **breathe** in the fresh air. Then, they discovered a ca<u>nnon</u> with a rose in it. Kate picked it up but was hurt by the **thorn** on it and a **leaf** dropped.

"Does it involve a curse?" she **thought**. They suddenly saw a cobra which tended to **crawl** towards them. They wanted to create an easy moment but they failed. Indeed, the cobra aimed at looking for a concrete cover as a shelf because the **net** that the cobra had was not favorable. Kate believed it was definitely a **black** Friday but Bess explained everything was only a coincidence. When they returned to the cruise, Kate was very surprised to see her boyfriend, Anson, standing on board with a three-layer wedding cake and a diamond ring which cost fifty thousand dollars on top of the cake. "Kason" is actually a cruise for Kate by Anson as he would like to include their names into the cruise so as to **prove** his love to Kate. Everything that Kate encountered was actually arranged by Anson as he intended to let her **feel** unlucky on black Friday but suddenly the happiest thing ever happened! Anson has been hoping to have a smooth progress and has no problem during the proposal. After a precise oath to Kate, both of them have no regret of being with each other. The love curse is like a **gleam** shining for their glory!

Questions for Passage 1

1. Do you think Brownie is a clever dog? Why?
2. What thing that Brownie did impress you most?
3. Is Brownie naughty? Why?
4. Does Brownie have chances to embrace nature? Where does he go?
5. What does Brownie usually do when he goes to the beach?
6. What kind of food does grandpa like? What will happen on grandpa after eating that kind of food?
7. What does Kathy think about Brownie?
8. Why do you like this story rather than another one?

Questions for Passage 2

1. What day was it when the event happened? Where did it happen?
2. What was the gift that Kate planned to give it to Bess?
3. Did Kate go to the cruise by herself? How did she get there?
4. Which floor did she stay on board?
5. What happened when Kate picked up the rose in the canon?
6. Which animal did Kate see? Was she afraid of it?
7. What was the surprise that Kate had? What gifts did she receive from Anson?
8. What had Anson been hoping during the proposal?
9. Why do you like this story rather than another one?

Word List

coffee	perfect	vanish	cover	healthy
fourth	cough	precise	fast	value
thankful	vase	thought	lack	roar
plan	roof	car	last	need
net	full	press	breathe	leaf
print	vault	cannon	grass	nor
look	prove	please	north	broad
noon	bruise	cliff	problem	grieve
black	plot	glass	bless	crab
thorn	cream	live	plant	brother
cruise	grill	filthy	grab	thousand
glad	block	crawl	noodle	clock
gleam	create	leader	believe	shallow
groove	clean	glance	fifty	therefore
clap	weather	coral	parade	rapid
surprise	blue	ferry	class	romance
breath	many	neither	layer	complete
progress	feel	deprive	plateau	complex

platform	vet	bracelet	thin	brownie
cobra	fan	glory	van	thief
greedy	this	clothing	blockade	though
include	real	ran	care	that
with	embrace	blanket	credit	increase
concrete	clever	disclose	grandpa	regret
year	dare	glamour	neglect	proof

APPENDIX C

Questionnaire

A) Biographical Information

Name: ______________________ Gender: M / F

Age: 20-25 26-30 31-35 36-40 41-45 46-50 51-55 55-60

Place of living (District):_______________

Occupation: ______________ Job Position: __________

Job duties:____

Monthly salary: below $10000

$10000 - $19999

$20000 - $29999

$30000 – $39999

above $40000

B) Educational Background and English-Language Learning Experience

1. Secondary school

Chinese-medium school/ English-medium school

2. Level of qualification

secondary school / associate degree/ undergraduate / postgraduate

Major: ___________

3. What grade did you obtain in English in the HKCEE and HKAL (particularly in oral)?

HKCEE: ________ HKAL: ________

4. Have you taken TOEFL/IELTS? Yes / No

If yes, how many points did you get?

5. When did you start learning English?

6. How many years (approximately) have you learnt English at school?

7. Do/Did you continue to study English after graduation?

If yes, when? For how long?

8a. Have you been to any English-speaking countries? Yes / No

If yes, where?

For what purpose? For how long?

8b. Was English the primary language you spoke in that country?

C. Language Use

1. What is your mother tongue?

A. Cantonese B. Mandarin C. English

D. Others, please specify________

2. Generally speaking, what is the primary language you speak?

A. Cantonese B. Mandarin C. English

D. Others, please specify ________

3. What is the primary language you speak at home?

A. Cantonese B. Mandarin C. English

D. Others, please specify ________

4. What is the primary language you speak to other family members or relatives?

A. Cantonese B. Mandarin C. English

D. Others, please specify ________

5. What is the primary language you speak when talking with your friends?

A. Cantonese B. Mandarin C. English

D. Others, please specify ________.

6a. What is the primary language you speak at work? (please go to Q.6b if you choose English)

A. Cantonese B. Mandarin C. English

D. Others, please specify ________

6b. Do you speak English to your boss or subordinates or both?

7. How often do you speak English in general?

A. Frequent B. Intermediate C. Infrequent

8. If English is not the primary language you speak at home, at work or with friends, on what kind of occasions will you use it?

9. By which kind of means are you able to get the exposure to English?

10. In what way do you think the amount of exposure to English may affect one's English pronunciation? Is it necessary to have more exposure for better English?

D. Language Attitude

1. Which variety of English do you like the most?

A. British English B. American English C. Australian English

D. Other varieties, please specify ____ ___

Why?

2. Have you tried to imitate this variety?

Why?

3. Which variety of English do you think you speak?

A. British English B. American English C. Australian English

D. Other varieties, please specify ________

Why?

4. Are you proud of speaking such variety of English? Why?

5. Do you think you speak English with a Hong Kong accent? Any examples?

6. How do you feel about English spoken with a Hong Kong accent? Do you think you are able to identify a speaker as a Hongkonger according to his/her Hong Kong accent?

7. Will you speak the same variety/accent when you talk to a native English speaker?

8. Will you adjust your accent if you talk to other speakers who are not native English speakers?

If yes, how?

9. Have you ever thought of discarding your Hong Kong accent if you think you have this accent? Why?

If yes, what did you do or would you like to do to get rid of it?

APPENDIX D

Interview Questions

1. What do you think about your English pronunciation in general? Do you want to have any improvement?
2. Are you aware of your pronunciation when you speak English to different people?
3. Have you ever learnt English pronunciation (in school or language center)?
4. What do you perceive about the relationship between speaker's personal background (e.g. family and educational) and his/her English pronunciation? Any positive or negative effect?
5. To what extent do you think the instruction in your CMI/EMI school plays a role in your English pronunciation as you have more/fewer chance to speak English over the years?
6. Do you think that people who studied in EMI schools before the handover speak better English (in terms of accurate pronunciation and fluency) than those studying in EMI schools after the handover?
7. Do you agree that one's social status is reflected by his/her English pronunciation? Why do you think so?

8. If a Hongkonger speaks English without Hong Kong accent (e.g. with American or British variety), would you regard him/her having high social status?

9. Based on your observation, do you think women speak better English than men in Hong Kong?

APPENDIX E

Background of the Participants

Participants in the age group of 20-30

Name (Psedonym)	Gender	Occupation	Job Position	Salary	Education Level (Major)	Duration of Stay in English-Speaking Countries
Brett (F*)	M	Guest Relations	Guest Relations Officer	$10000-19999	Master (General Management)	3.5 years Australia
Frank (N+)	M	Banker	Vice President	$30000-39999	Bachelor (Finance and Global Business)	5 years England
Jim (F)	M	Banking	Manager	>$40000	Bachelor (Computer Science)	1.5 years U.S.A.
Jake (I^)	M	Interior Design	Interior Designer	$10000-19999	Associate degree (Social Science in Community Services Management)	1 week U.S.A.
Nick (I)	M	Real Estate	Project Executive	$10000-19999	Bachelor (Chemistry)	3 weeks Australia

Name (Psedonym)	Gender	Occupation	Job Position	Salary	Education Level (Major)	Duration of Stay in English-Speaking Countries
Lloyd (F)	M	Instructor	Language Instructor	$30000-39999	Master (English)	1 month England
Wayne (I)	M	Clerk	Project Assistant	$10000-19999	Bachelor (International Studies)	None
Vance (I)	M	Environmental Consultant	Consultant	$10000-19999	Master (Environmental Technology)	1 year England
Ally (N)	W	Research Assistant	Research Assistant	$10000-19999	Master (English)	5 weeks (England) 2 weeks (U.S.A.)
Belle (N)	W	Teacher	Teacher	>$40000	Postgraduate Diploma (Education)	4 months Australia
Eve (I)	W	Teacher	Teacher	$20000-29999	Postgraduate Diploma (Education in Chinese Language)	1 weeks England
Emmy (I)	W	Information Technology	Programmer	$10000-19999	Bachelor (Information system)	3 weeks Australia

Name (Psedonym)	Gender	Occupation	Job Position	Salary	Education Level (Major)	Duration of Stay in English-Speaking Countries
Faye (N)	W	Media	Research Writer	$10000-19999	Bachelor (Cinema and Television)	1 month Australia
Rose (N)	W	Human Resources	Officer	$10000-19999	Bachelor (Psychology)	1 week - 2 months Australia, U.K., U.S.A.
Ruth (I)	W	Welfare Worker	Welfare Worker	$10000-19999	Associate degree (Social Science in Social Welfare)	None
Vera (I)	W	Auditor	Auditor Trainee	<$10000	Bachelor (Accounting)	None

Participants in the age group of 31-45

Name (Psedonym)	Gender	Occupation	Job Position	Salary	Education Level (Major)	Duration of Stay in English-Speaking Countries
Aiden (I)	M	Money Changer	Director	$30000-39999	Bachelor (General Business)	5 years Canada
Bob (F)	M	Tour Guide	Tour Guide	$20000-29999	Bachelor (Business Management/Plants and Animals)	6 years Canada
Jay (F)	M	Product Sourcing	Sourcing Manager	$30000-39999	Secondary School	1 week U.S.A.
Koen (N)	M	Money Exchange	Clerk	$10000-19999	Associate Degree (Economics)	5 years Canada
Leo (I)	M	Correctional Services Department Officer	Officer	$30000-39999	Master (Physics)	None
Otto (N)	M	Trading	Self-employed	$10000-19999	Bachelor (German)	2 weeks Canada
Phil (F)	M	Consultant	Consultant	$20000-29999	Master (Management)	1 year U.K.

Name (Psedonym)	Gender	Occupation	Job Position	Salary	Education Level (Major)	Duration of Stay in English-Speaking Countries
Rex (I)	M	Lawyer	Lawyer	$20000-29999	Master (Chinese Law and Comparative Law)	None
Becky (N)	W	Marketing	Public Relations Manager	$30000-39999	Master (Communication)	2 months Canada
Ella (I)	W	Human Resources	Assistant Human Resources Manager	$20000-29999	Bachelor (Accounting)	3.5 years Australia
Fion (I)	W	Research Assistant	Research Assistant	$10000-19999	Master (English)	2-3 weeks each U.K.,U.S.A.
Rena (I)	W	Doctor	Medical Officer	>$40000	Bachelor (Surgery and Medicine)	2 weeks U.K.
Sara (N)	W	Education	Counselor	$20000-29999	Master (Social Work)	2 weeks each England, New Zealand
Tina (N)	W	Information Technology	Senior Analyst Programmer	$20000-29999	Diploma (Programming Technology)	3 months Canada

Name (Psedonym)	Gender	Occupation	Job Position	Salary	Education Level (Major)	Duration of Stay in English-Speaking Countries
Sofia (N)	W	Executive	Executive	>$40000	Diploma (Business Management)	2-3weeks each Australia, U.K., U.S.A.
Tonia (I)	W	Marketing	Course Supervisor	$10000-19999	Bachelor (Communication)	Several months each Australia, Canada, England

Participants in the age group of 46-60

Name (Psedonym)	Gender	Occupation	Job Position	Salary	Education Level (Major)	Duration of Stay in English-Speaking Countries
Ian (N)	M	Doctor	Doctor	>$40000	Master (Medicine)	1 month U.K.
Jeff (I)	M	Merchandiser	Officer	$20000-29999	Master (Textile)	4 years Australia
Kiel (I)	M	Utility	Manager	>$40000	Master (Engineering)	1 – 2 weeks each Australia, U.S.A., New Zealand
Kelvin (F)	M	Marketing Manager	Global Sales and Marketing Manager	>$40000	Bachelor (Business and Economics)	28 years Canada
Oscar (N)	M	Solicitor and Notary	Partner in a law firm	>$40000	Master (History and Political Science)	6 months (England) few weeks (U.S.A.)
Perry (N)	M	Security	Security Officer	$30000-39999	Associate Degree (Management)	10 days each England, U.S.A.
Raul (I)	M	Insurance Booker	Self-employed	$20000-29999	Secondary School	1 – 2 weeks each Canada, U.K., U.S.A., New Zealand

Name (Psedonym)	Gender	Occupation	Job Position	Salary	Education Level (Major)	Duration of Stay in English-Speaking Countries
Leah (F)	W	Executive	Manager	>$40000	Bachelor (Business Management)	7 years Canada
Ann (F)	W	Apparel Industry	Merchandising Director	>$40000	Master (Business Management)	22 years Canada
Alice (N)	W	Teacher	Teacher	>$40000	Master (Education)	2 – 3 weeks each Canada, England
Bonnie (I)	W	Administrator	Executive Assistant	$30000-39999	Master (Textile)	4 years Australia
Jade (N)	W	Secretary	Senior Personal Secretary	$30000-39999	Diploma (Executive Secretarial Studies)	None
Lily (F)	W	Clerk	Clerk	$20000-29999	Secondary School	1 week each Australia, England, U.S.A.
Macy (I)	W	Clerk	Clerk	$10000-19999	Secondary School	1 month U.S.A.
Zoe (F)	W	Management Consultant	Manager	$30000-39999	Master (Marketing)	2 years England

*(F) = Frequent use of oral English

+(N) = Intermediate use of oral English

^(I) = Infrequent use of oral English

APPENDIX F

Consent Form

Participant's Name: __________ **Participant's Code Number:** ______

1. Introduction and Background Information

The study is being conducted by Grace LEUNG Ming Ming, a PhD student in Applied English Linguistics at the Chinese University of Hong Kong. The study will focus on the use of English in Hong Kong and the opinions towards English by native Cantonese speakers of English. It is hoped a better understanding of the use of English and the attitudes towards the use of English in Hong Kong could be obtained through this study.

2. Procedures

Your participation in this study will last for approximately one hour. In this study, you will be asked to complete two reading tasks, a questionnaire, and to participate in an individual interview.

3. Privacy

The study may involve the revealing of some personal information, but your information provided would only be used for research purpose of this study; and will be kept confidential. To respect and to protect your privacy, pseudonyms will be used in this study.

4. Benefits

The information collected may not benefit you directly. The information learned in this study may be helpful to others, in the way that it may help to provide a better understanding of the use of English and the attitudes towards the use of English by native Cantonese speakers in Hong Kong.

5. Questions

You acknowledge that you have been explained about the research purpose and procedure, and all your questions have been answered. If you have any questions about the study, please contact Grace LEUNG Ming Ming at 6017 0297.

If you have any questions about your rights as a research participant, concerns or other questions, you may contact Grace LEUNG Ming Ming. If for any reasons that you do not wish to enquire the researcher about these, you may also contact the Graduate School of the Chinese University of Hong Kong at 2609 8976/ gradschool@cuhk.edu.hk

6. Consent Form

You will be given a copy of this consent form for reference.

Your participation in this research study is voluntary (your personal choice). You are free to withdraw your consent at any time without penalty or losing benefit to which you are otherwise entitled. Please sign below if you agree to participate.

Participant's Signature: ____________________ Date: ______________

Researcher's Signature: ____________________ Date: ______________

* This consent form is adapted from *Subject Informed Consent Form Template*. Retrieved 5 August, 2005 from research.louisville.edu/ UHSC/consent-template_specimen.pdf

* Participants in the research will be given the Chinese version of this consent form