A project report entitled

Tackling Phonemic Problems of Hong Kong Secondary ESL Students

through Minimal Pairs: A Quasi-Experimental Study

Submitted by

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Declaration

I, *LAM, Ting Lan Sarah*   , declare that this research report represents my own work under the supervision of *Dr. John Trent*, except where due acknowledgement is made, and that it has not been submitted previously to any other tertiary institution.

Signed _____

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Abstract

This quasi-experimental study investigates the effect of minimal pair approaches in pronunciation remedial teaching in a Hong Kong senior secondary English as second language (ESL) classroom. By comparing the performance on pronunciation of a Secondary 5 class comprised of 26 students, before and after receiving the remediation, this paper reveals the outcome of using minimal pairs for pronunciation teaching. The data for comparison were gathered through an oral pre-test and post-test, in which students read aloud confusable words, or sentences consisted of those words, of Cantonese ESL learners. The data, in the form of test scores, were analysed quantitatively. The results suggested minimal pair approaches brought about significant and prominent positive effect on tackling phonemic problems, with evidence showing the greatest effect on vowels while that on single consonants and consonant clusters being similar. Findings of this study may inspire educators to incorporate the use of minimal pairs in pronunciation remediation in order to improve students' language competence, which is essential for intelligible and effective communication.

Keywords: minimal pair*,* pronunciation, phonemic problem, quasi-experiment

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Tackling Phonemic Problems of Hong Kong Secondary ESL Students

through Minimal Pairs: A Quasi-Experimental Study

1. Introduction

Minimal pair approaches have always been discussed by educators when it comes to improving students' pronunciation, especially in the field of second language acquisition (Lado, 1957). By definition, a minimal pair consists of two words pronounced alike except for a single phonemic difference (D. K. F. Nilsen & A. P. Nilsen, 1973), and it is a pair of words that differ in meanings on the basis of a change in only one phoneme (Avery & Ehrlich, 1995), for example, 'pet' and 'bet' as a result of exchanging the phoneme /p/ for the phoneme /b/. As minimal pairs involve obvious phonemic distinctions, they are typically used to help students distinguish commonly confused sounds. In teaching pronunciation, Chan (2009) suggested that there is a close relation between speech perception and speech production; therefore, a variety of means to teach pronunciation through minimal pairs with respect to these two aspects is available, including the use of dictation exercises by asking students to listen to minimal pairs and the reading aloud of a minimal pair list (Chan, 2009). However, according to Chan (2009), minimal pairs are not solely useful at the instructional stage, they are also applied in pronunciation diagnostic tests which aim to investigate the nature of learners' problems and facilitate lesson planning for tackling the problems accordingly.

To fully utilize the usage of minimal pairs as suggested by Chan (2009), this study incorporates the use of minimal pairs into both the pronunciation diagnostic tests as well as the teaching of pronunciation. This investigation is first supported by highlighting the importance of making distinction between sounds in pronunciation, exploring the

common phonemic production problems encountered by Cantonese ESL learners in Hong Kong, and reviewing the corresponding approaches, especially minimal pair approaches, to tackle the common phonemic problems. Next, a framework of the quasi-experimental study aiming at investigating the effect of using minimal pairs in pronunciation teaching is described, and then applied to find out its effect on senior secondary 'English as second language' (ESL) learners in a Hong Kong classroom context. Implications for educators about the incorporation of minimal pairs in classrooms are then discussed; and lastly, suggestions for future research are considered.

2. Literature Review

2.1. The Importance of Making Sound Distinctions

Although it is still controversial if pronunciation is the most important element leading to successful language competence, many scholars have argued that it is one of the key components of achieving communicative purposes. Jenkins (2000) claimed that the mispronunciation of some phonological features, including all consonants except /θ/ and /ð/, all initial and medial consonant clusters, and the contrast between long and short vowels (e.g., /ɪ/ vs. /iː/), leads to unintelligibility in communication; Celce-Murcia, Brinton and Goodwin (1996) argued that without correct pronunciation, successful communication cannot take place. In other words, it is important for a speaker to produce correct pronunciation in order to facilitate effective and intelligible communication. Therefore, there is a need to address and find ways to tackle Hong Kong ESL learners' common pronunciation problems, which will be discussed in the following section, in order to accomplish communicative purposes.

2.2. Hong Kong ESL Learners' Common Phonemic Problems

A number of English pronunciation problems encountered by Cantonese ESL learners in Hong Kong have been documented in past studies, and these problems may result in unintelligibility (as discussed in the previous section). Most of the studies have related the problems to the distinction between learners' first language (Cantonese) and the target language (English), especially the differences between the two phonological systems (Chan, 2009). For example, when it comes to producing English consonants, it is difficult for Cantonese ESL learners to produce those which are non-existent in Cantonese, such as /tʃ/, /dʒ/ and /θ/ (see Appendix A for an overview of the two consonantal systems); therefore, substitution occurs by replacing consonants with easily confused Cantonese speech sounds (e.g., substituting /w/ for /r/) (Chan & Li, 2000; Hung, 2000), or by replacing voiced obstruents with devoiced sounds (e.g., substituting /s/ for /z/) (Chan & Li, 2000). Other than the problem of substitution, Wong and Setter (2002) pointed out that the confusion between the consonants /n/ and /l/ exists among Cantonese ESL learners as these sounds are often neutralized in Cantonese.

Furthermore, the production of consonant clusters is also one of the difficulties that Cantonese ESL learners often encounter as there are no such sounds in the Cantonese phonological system. Deletion is commonly adopted by Cantonese ESL learners by the reduction of the number of consonants in clusters (e.g., pronouncing "play" as "pay") (Chan & Li, 2000). Another strategy, epenthesis, which is the addition of one or more sounds to a word (e.g., pronouncing the word "English" /ˈɪŋ.glɪʃ/ as "Eng-e-lish" /ˈɪŋ.gəlɪʃ/), is also found to be used to handle the production of consonants clusters by

inserting an additional vowel between a consonant cluster (Chan & Li, 2000; Hung, 2000).

Regarding the production of English vowels, Chan and Li (2000) pointed out the problem of "underdifferentiating the distinction between the long and short vowel pairs", since there are only short vowels in Cantonese (see Appendix B for an overview of the two vowel systems). It is observed that some Cantonese ESL learners may replace a short vowel with a long one, and vice versa. Other than that, Sewell (2009) stated that substitution of a similar Cantonese speech sound occurs in the production of vowels, for example, by substituting /e/ for the vowel /æ/.

By reviewing the literature, the common phonemic problems encountered by Cantonese ESL learners in Hong Kong are generally identified; yet, as the above studies are not specifically related to learners at the secondary school level (e.g., Chan, 2009) or are mostly based on the sole observation of the authors (e.g., Chan & Li, 2000), a further diagnosis of phonemic problems of the participants in this study was needed so as to facilitate the thorough planning of the instructional materials used in the experiment.

2.3. Previous Studies on Using Minimal Pairs in Pronunciation Teaching

Although there are a number of pronunciation problems encountered specifically by Cantonese ESL learners in Hong Kong documented in the previous literature, to the author's knowledge, those studies were mainly addressing the problems without offering suggestions on pedagogy for solving the problems (e.g., Chan, 2011; Chan & Li, 2000), except for Chan's (2009) recommendation on a few remediation strategies. In addition to this, no specific studies that aim to experiment with teaching approaches to resolve the problems have been published as well. Thus, there is a need to start investigating the

suitable pronunciation teaching approaches which can benefit Hong Kong ESL learners. Since the minimal pair approaches are highly affirmed by scholars especially in the field of second language learning, they are chosen in this study as a start.

For many decades, minimal pair approaches, which aim at introducing phonemic distinctions in language (Blache, Parsons & Humphreys, 1981), have been used in second language learning (Lado, 1957) since it is believed that "minimal pairs are the backbone of the teaching of vowel and consonant sounds in ESL pronunciation texts" (Levis & Cortes, 2008). Hansen (1995) pointed out that language teachers can improve their students' pronunciation by drilling minimal pairs to enhance their intelligibility. This view is shared by Rajadurai (2001) when she conducted a case study in Malaysia, that this way of teaching "makes students more conscious of their own pronunciation and aware of ways in which their pronunciation differs from the model offered". These views illustrate the effectiveness of minimal pairs in facilitating pronunciation acquisition.

Although some researchers argued that teaching pronunciation in real contexts is more meaningful than teaching non-contexualised minimal pairs or isolated segments (e.g., Chela-Flores, 2001), many renowned pronunciation resources used by ESL teachers, for instance, Baker (1981), also include minimal pairs in teaching and learning materials for second language learning. This proves that minimal pairs do serve some purposes for improving students' phonemic awareness and the differentiation of easily confused words.

The previous literature has given positive feedback on the effectiveness of the minimal pair approaches; yet, to the author's knowledge, there is no focused research on whether minimal pair approaches bring benefits particularly to ESL students in Hong Kong to help tackle their phonemic problems, which are mainly caused by the first

language influence. Therefore, this research aims to examine the effect brought by teaching pronunciation through minimal pairs in Hong Kong.

3. Research Questions

This quasi-experimental study endeavours to investigate the effect of adopting minimal pair approaches in a Hong Kong senior English classroom by analysing the responses to two research questions:

1. What is the effect of teaching pronunciation through minimal pairs on tackling phonemic problems of senior secondary Cantonese ESL students?

2. Will this method result in any difference in the learning of single consonants, consonant clusters, and vowels?

These two research questions are designed in hopes of finding an effective approach to help tackle the common phonemic problems encountered by secondary ESL students in Hong Kong. The second research question has been structured specifically for examining the effect of minimal pair approaches on the three targeted pronunciation domains, as it was documented that the approaches bring remarkable improvement to these domains but without relevant evidence.

4. Methodology

A quasi-experimental study approach, aiming at investigating the effect of using minimal pairs in pronunciation teaching, was adopted in this study for several reasons. Firstly, quasi-experimental designs have long been used to evaluate the effectiveness of certain teaching strategies. Secondly, due to the constraints imposed by the selected classroom setting where randomization was impractical, a quasi-experiment design contributes to a simpler set-up than a true experimental design does (Campbell & Stanley,

1963). Thirdly, after reviewing the literature, it is observed that a considerable amount of quantitative research has been undertaken to investigate ESL learners' progress in learning different domains, such as vocabulary or grammar, while very few have been conducted to investigate their pronunciation acquisition progress with the use of different remedial teaching strategies; therefore, a small-scale quantitative study is required prior to a large-scale investigation. The overall framework of the study is described in the following.

4.1. Setting and Participants

The research was conducted in a secondary school located in Kwai Chung, which ranked in the upper Band Two among the secondary schools in Hong Kong (with Band 1 being the most academically prestigious).

The project class was a Secondary 5 ESL class comprised of 26 native Cantonese speakers, which contributes to a total of 26 participants in this research. Under the streaming policy in English classes at this school, this class was considered as having the lowest level of proficiency in English among all five classes in the whole form. The class consisted of 23 males and 3 females. Having a greater number of male participants than female participants was virtually unavoidable since this was the original classroom setting of the school; thus, its effect might have to be taken into account.

4.2. Data Collection

The participants were asked to take part in a pre-test and a post-test on pronunciation production. Between the two tests, phonological remediation adopting minimal pair approaches was offered to the participants. This research design was intended for comparing students' pronunciation performance before and after receiving

teaching under minimal pair approaches. The detailed flow of the two-month experiment and instruments used are provided below.

4.2.1. Pre-test. A pre-test (see Appendix C) was designed to serve as a means to identify the variables of the participants (Gribbons & Herman, 1997), and as a diagnostic test for investigating the nature of learners' problems for facilitating instructional planning (Chan, 2009). The participants were required to read aloud some words and sentences, and their performance was recorded using a high-quality recorder.

In terms of the content, three production tasks were included in the test: reading isolated words (Task 1), reading minimal pairs (Task 2), and reading sentences with meanings (Task 3). The tasks were constructed with reference to suggestions offered by by the previous literature (e.g., Chan, 2009, 2011), so that the design of the pre-test could be supplemented and more all round. Also, it was comprised of both the traditional non-contextualized minimal pair exercises as well as the contextualized minimal pair exercises, in order that fairer data, which were not affected by the presence of a context, could be collected (Levis & Cortes, 2008). The test involved the general phonemic problems made by Hong Kong ESL learners (covered in the literature review) as well as the frequent phonemic problems observed in the class.

The full mark of the test is 240, with each targeted domain in the second research question (i.e., "single consonants", "consonant clusters", and "vowels") carrying 80 marks.

4.2.2. Remedial teaching. To examine the effect of minimal pair approaches, remedial sessions using minimal pairs were offered to the whole project class by the same researcher on a weekly basis, two times a week. There were altogether twenty remedial

sessions conducted in a conventional Hong Kong classroom setting, with each lasted for five to ten minutes. The entire research took place for two months.

Regarding the remedial teaching strategies and instructional materials, Barlow and Gierut (2002) stated that when adopting conventional minimal pair approaches, a teacher should focus on (a) modifying groups of sounds that are produced in error in a patterned way; (b) highlighting featured contrast; and (c) emphasizing sound use for communicative purposes. Such criteria and the suggestions provided by the previous literature were taken into account during the lesson planning and material production. The common phonemic problems diagnosed from the pre-test were also taken into consideration.

With reference to Chan (2009), both the receptive skills and productive skills in differentiating minimal pairs should be developed so that learners can discriminate between confusable words when listening to others, and produce correct sounds in communication. Therefore, for training the receptive skills, identification exercises involved:

- dictation exercises by asking students to listen to minimal pairs (Chan, 2009);

- listening tasks on minimal pairs without context (see Appendix G);

- listening tasks on minimal pairs in context (Hewings, 2004) (see Appendix H);

- classification tasks (see Appendix I); and

- the "Bingo" game (Celce-Murcia, Brinton, & Goodwin, 1996) (see Appendix J).

For developing the productive skills, awareness-raising production exercises included in the remedial teaching were:

- reading aloud of isolated words;

- reading aloud of minimal pairs (see Appendix K);

- picture-word induction tasks (see Appendix L);

- tongue twister challenge (see Appendix M); and

- short story writing tasks (Wajnryb, 2003) (see Appendix N).

Some other tasks embracing both receptive and productive training were also adopted, for example, the pair practice activity (Celce-Murcia, Brinton, & Goodwin, 1996) (see Appendix O) where the participants took turn with partners to read aloud and listen to the confusable words.

The researcher involved a variety of teaching strategies and activities in order that the remedial sessions could be more interacting and motivating, and could cater for learner diversity as well. During and after each task or activity, the researcher put emphasis on the contrast of words and sounds, so that the importance of the distinction of sounds could be reinforced during the whole remedial teaching process.

4.2.3. Post-test. After receiving two-month remedial teaching, the participants completed the post-test (see Appendix E) by reading aloud some words and sentences, and their performance, again, was recorded using a high-quality recorder.

The content of the post-test was basically the same as that of the pre-test, solely with the sequence of the test items changed, so that it prevented the participants from blindly recalling the sequence of items tested.

4.3. Data Analysis

The participants' performance in the recordings of the pre-test and post-test was analysed by the researcher and another experienced English teacher to ensure the reliability of the marking. In the condition where there was any difference in the marking,

a third marker, another English teacher, was involved to make the final decision. Marking schemes of the pre-test (see Appendix D) and the post-test (see Appendix F) were designed in order to ensure all markers had the same standard in marking. International Phonetic Alphabet (IPA) symbols, which denote pronunciation of English words, were given under each targeted word so that the markers could make reference to them when necessary. The markers marked the tests by putting a tick against the correctly pronounced phonemes but a cross against the incorrectly pronounced phonemes. As each targeted phoneme carries one mark, the number of ticks represented the marks the participant gained. While marking, only the targeted phoneme(s) in a word was(were) considered without taking the pronunciation of other phonemes into account, so that a fair result could be generated. The total mark of the tests, as well as the mark gained in each targeted domain were recorded on the last page of the marking schemes of the pre-test and post-test accordingly.

The results of the pre-test and post-test provided quantitative data for answering the two research questions. The final results of the post-test were compared with those of the pre-test in order to examine whether there was an improvement brought by the adoption of minimal pair approaches. By conducting such analysis, the first research question could be answered; following this analysis, as all the items of the tests were categorized into three domains (i.e., "single consonants", "consonant clusters", and "vowels") with different colour coding (see Appendices D and F for the marking schemes), the second analysis of the data was done by comparing the results of two tests in each domain. By doing so, the second research question could be addressed. In order to

verify whether the observed mean differences between the results of the pre-test and post-test were statistically significant, paired-sample T-tests were conducted in both analyses.

5. Ethical Issues

Throughout the data collection process, some ethical issues might be aroused by the reading aloud pre-test and post-test. As the participants were required to read aloud some English words and their performance was being recorded, their confidence might be affected since they might be discouraged when they were not able to read some of the words in the tests. To reduce their pressure, the researcher emphasized to the participants that the test results would not be counted in their school academic results. Also, in order to protect the recordings against unintended or unauthorized access, all the recorded data collected were kept confidential and would be deleted permanently at the end of the research.

6. Results

6.1. Overall Performance in the Pre-test and Post-test

To begin with, the overall performance of the pre-test and post-test was compared in order to answer the first research question. In Table 1, information about the participants' total scores of pre-test and post-test are shown.

Table 1
Participants' Overall Results

	Pre-test		Post-test			
	M	*SD*	*M*	*SD*	*N*	*t*
Overall results	172.15	5.10	193.50	5.67	26	25.77*

* *p* < .001.
Note. Full mark = 240.

The full marks of both the tests are 240. The range of the pre-test is from 158 to 182 marks while that of the post-test is from 182 to 204 marks. A paired-samples T-test

was conducted to compare participants' overall reading aloud performance before and after receiving the remedial teaching. There was a significant difference ($t = 25.773$, $p <$ .001) between the pre-test ($M = 172.15$, $SD = 5.10$) and the post-test ($M = 193.50$, $SD = 5.67$). Specifically, students' overall scores of the reading aloud test improved by an average of 21 marks. These results suggest that minimal pair approaches seem did have a positive effect on pronunciation acquisition in this study.

To measure the degree of such effect, Cohen's d, which is for finding out the effect size of the standardised difference between the means of the pre-test and post-test, was calculated. The Cohen's d was found to be 3.96; therefore, it demonstrated that minimal pair approaches were effective in tackling the participants' phonemic problems, and the effectiveness was considered as very large.

6.2. Performance in the Three Targeted Domains

Following the overall results, the participants' performance in the three targeted domains (i.e., "single consonants", "vowels", and "consonant clusters") in the pre-test and post-test was compared in order to answer the second research question. Table 2 shows the information about the participants' scores of the pre-test and post-test in terms of the three domains.

Table 2
Participants' Results in the Three Targeted Domains

	Pre-test		Post-test			
	M	*SD*	*M*	*SD*	*N*	*t*
Single consonants	65.12	2.16	71.65	2.19	26	18.36*
Consonant clusters	66.27	1.69	72.31	1.52	26	17.55*
Vowels	40.77	2.82	49.54	4.21	26	14.53*

* $p < .001$.
Note. Full mark in each domain = 80.

6.2.1. "Single consonants" domain.   Regarding the "single consonants" domain, the full mark of this domain is 80. The range of the scores in the pre-test is from 60 to 69 marks while that of the post-test is from 67 to 75 marks. From the results of the T-test, a significant difference ($t = 18.36$, p $< .001$) between the pre-test ($M = 65.12$, $SD = 2.16$) and the post-test ($M = 71.65$, $SD = 2.19$) was found. Specifically, the scores improved by an average of 6.54 marks.

6.2.2. "Consonant clusters" domain. For the "consonant clusters" domain, the range of the scores in the pre-test is from 63 to 69 marks while that of the post-test is from 70 to 75 marks, with 80 marks as the full mark in both the tests. There was a significant difference ($t = 17.55$, $p < .001$) between the pre-test ($M = 66.27$, $SD = 1.69$) and the post-test ($M = 72.31$, $SD = 1.52$). The scores increased by an average of 6.04 marks specifically.

6.2.3. "Vowels" domain. In terms of the "vowels" domain, the full mark of this domain is 80 as well. The range of the scores inthe pre-test is from 36 to 46 marks, whereas that of the post-test is from 43 to 58 marks. The study found a significant difference ($t = 14.53$, $p < .001$) between the pre-test results ($M = 40.77$, $SD = 2.82$) and the post-test results($M = 49.54$, $SD = 4.21$). The scores have improved by an average of 8.77 marks specifically.

6.2.4. Comparison of the improvement in each domain. The aforementioned data show that there was improvement in participants' performance in terms of all the three targeted domains in the reading aloud test. To address whether minimal pair approaches result in difference in the effectiveness on the three domains, as stated in the

second research question, the differences in scores between the pre-test and post-test in

each domain are listed in Table 3 for comparison.

Table 3
Differences in Scores between the Pre-test and Post-test

	Difference between the tests		
	M	*SD*	*N*
Single consonants	6.54	1.82	26
Consonant clusters	6.04	1.76	26
Vowels	8.77	3.08	26

With reference to the data shown in Table 3, improvement was observed in all

the three targeted domains, with the highest average gain in the "vowels" domain ($M =$

8.77, $SD = 3.08$), and similar average gains in the "single consonants" domain ($M = 6.54$,

$SD = 1.82$) and "consonant clusters" domain ($M = 6.04$, $SD = 1.76$). A paired-sample T-

test was done by comparing the gains in the scores in each domain with those of the other

two domains. The results of the paired-samples T-test are provided in Table 4.

Table 4
Comparison of the Difference in Average Scores among the Three Domains

	M	*SD*	*t*
Single Consonants - Vowels	-2.23	3.62	-3.15*
Vowels - Consonant Clusters	2.73	3.07	4.54**
Consonant Clusters - Single Consonants	-0.500	2.69	-0.95***

* *p* = .004. ** *p* < .000. *** *p* = .352.

According to the results of the T-test, it was found that the minimal pair

approaches adopted in this study worked more effectively in the "vowels" domain than in

the "single consonants" domain ($t = 3.15$, $p = 0.004$) and the "consonant clusters" domain

(t = 4.54, p <.001), while the approaches demonstrated similar effectiveness on the "single consonants" and "consonant clusters" domains (t = 0.95, p = 0.352). Such effectiveness can be illustrated by the following diagram.

The effectiveness of minimal pair approaches on tackling phonemic problems of:
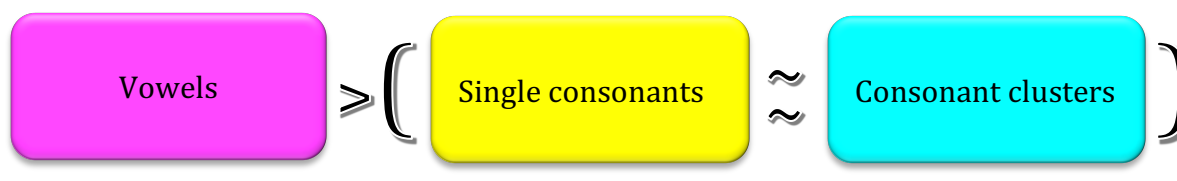
7. Discussion

The design of this study aims at evaluating the effect of minimal pair approaches on Hong Kong secondary ESL students' phonemic problems. The research results indicate that minimal pair approaches do have a positive effect on pronunciation acquisition. In the hopes of finding an effective approach to solve students' pronunciation problems, the effectiveness of this kind of approaches and learners' main difficulties are worth further discussion.

7.1. Effectiveness of Minimal Pair Approaches

7.1.1 Overall effectiveness. The results of the participants' overall performance suggest that minimal pair approaches do have a positive effect on tackling phonemic problems of the participants, who were senior secondary Cantonese ESL students. There was an obvious improvement (an average of 21 marks) in the post-test results as compared with the pre-test results. Not only does this evidence answer the first research question of this study, but it also echoes the literature by Blache, Parsons and Humphreys (1981) and Rajadurai (2001), which state that minimal pair approaches have a positive impact on introducing phonemic distinctions and facilitating pronunciation acquisition.

With the large effect size calculated, it shows that this improvement is significant and noteworthy, and the effectiveness of such approaches was proved to be very prominent.

   7.1.2. Comparison of the effectiveness in the three targeted domains. Evidence shows that this kind of teaching approaches demonstrated effectiveness in all the three targeted domains, which are "single consonants", "vowels", and "consonant clusters", since there was improvement observed in the post-test in all the three domains. However, the data suggest that this kind of teaching approaches did result in different effectiveness in learning various sound production, and this responded to the second research question. The results show that the minimal pair approaches worked most effectively in the "vowels" domain (i.e., an average gain in marks by 8.77) in this study, compared with the "single consonants" and the "consonant clusters" domains (i.e., an average gain in marks by 6.54 and 6.04 respectively) which demonstrated similar effectiveness.

   Regarding the significant improvement in the "vowels" domain, the participants achieved huge progress in the differentiation between long vowels (e.g., /i:/) and short vowels (e.g., /ɪ/). Although these are common confusable sounds of ESL learners (Chan & Li, 2000), the use of minimal pair approaches did help the participants to cope with the phonemic problems. Also, the participants' awareness of the distinction between the vowels /e/ (as in the word "men") and /æ/ (as in the word "man"), which does not appear in the Cantonese vowel system, was increased. This shows that minimal pair approaches undoubtedly benefited the sound distinction in pronunciation acquisition, especially in the "vowels" domain.

7.2. Learners' Challenges

Though there was improvement observed in the "single consonants" and "consonant clusters" domains, the degree of improvement was less noticeable and less significant compared with that of the "vowels" domain. As many consonants (e.g., /r/ and /ð/) and all consonant clusters (e.g., /pl/ and /θr/) are not existed in Cantonese (Chan & Li, 2000; Hung, 2000), it might be hard for the participants to correct them within a short period of time; and hence, the improvement might then be less obvious in these two domains.

In terms of consonants, the participants often failed in producing consonants which do not exist in Cantonese during the tests and the remedial sessions. It was observed that many of them exploited substitution to handle such difficulty by replacing the English consonants with similar Cantonese consonants, for example, they pronounced "they" as "day", and "raise" as "ways". This evidence is resonant with the statements made by Chan and Li (2000) and Hung (2000). Nevertheless, some of the results do not echo with the previous research; for instance, Wong and Setter (2002) claimed that Cantonese ESL learners tend to confuse the consonants /n/ and /l/, however, this difficulty was not observed in this study.

Regarding the "consonant clusters" domain, the participants made use of deletion as well as substitution to deal with the pronunciation difficulties. First, the use ofdeletion, which is a common strategy for Cantonese ESL learners to handle consonant clusters (Chan & Li, 2000), was observed as in the example of pronouncing "shred" as "shed". Second, the use of substitution in consonant clusters was fairly obvious in the participants', for instance, by replacing /dr/ in the word "dream" by /j/, substituting /gw/

for /gr/ in the word "green". Nonetheless, the results do not show any tendency of the participants to exploit epenthesis (i.e., adding an unnecessary sound within a consonant cluster), which is believed to be a common strategy used by Cantonese ESL learners (Chan & Li, 2000; Hung, 2000), when producing consonant clusters.

The evidence suggests that many of the mispronunciation of sounds was due to the influence from the participants' first language (L1) — Cantonese. Therefore, more work has to be done by educators to address the L1 influence, especially on consonant clusters, in order to avoid unintelligibility in communication in English (Jenkins, 2000).

8. Implications

The study demonstrates that minimal pair approaches are advantageous for tackling the phonemic problems of senior secondary ESL students in Hong Kong. As it is important to resolve students' pronunciation problems so as to raise the intelligibility of a speech, this kind of approaches may also be adopted in other ESL contexts as well, such as in primary classroom settings. There is a variety of teaching and learning activities involved in this study (see Appendices G to O for the instructional materials and explanation on the activities); thus, educators may integrate the suitable activities in their classrooms, according to learners' interest, learning styles and language proficiency.

In addition, some considerations are required to be taken into account during the implementation of teaching through minimal pairs. First, educators may have to perform either formal or informal diagnostic tests with learners, which could be done by asking students to read aloud reading passage involved in everyday classes. By doing so, the teacher can collect evidence of learners' pronunciation weaknesses and design instructional materials accordingly. Second, in the material design and lesson planning,

diverse activities are encouraged to be included in order to increase the exposure of the targeted sounds in various situations. The nature of tasks can be controlled (e.g., listening task in Appendix H) for only focusing on particular pronunciation production, as well as structured (e.g., short story writing task in Appendix N) for enhancing students' creativity and using the knowledge with meaningful purposes (Pennington, 1996).

Furthermore, with the tight teaching schedule in Hong Kong, it is understood that it may not be feasible to arrange a long period of time in a regular classroom for teaching pronunciation with the use of minimal pair approaches. Therefore, if there is a time constraint, the educators may consider only focusing on the remediation of vowels first, since it was proved in this study that minimal pair approaches work better in this domain in a Hong Kong ESL classroom; however, if time allows, consonants and consonant clusters may also be addressed as such approaches are beneficial to the learning of these two domains as well.

9. Limitations

The limitations of the study design should be acknowledged since they could have potentially affected the accuracy of results. First, the experimental group was not randomly chosen because the researcher could not get access to other classes to conduct this research, and hence, convenient sampling was adopted for this study. Second, as there are independent variables existing in such quasi-experimental design, such as gender, as well as the difference in language proficiencies, there may have already been other differences contributing to the research results. Third, the experiment was limited to a small number of participants (i.e., 26 students) and the short duration for remedial

teaching, the relevance of the results may be affected and this might lead to the imprecise estimate of the effect. Lastly, regarding the design of the pre-test and post-test, the words involved might be difficult for some of the participants; the failure of pronouncing an unfamiliar word, rather than the inability to pronounce a certain phoneme, might affect the test results.

Future studies can be done to examine the effect of minimal pair approaches on tackling phonemic problems of Hong Kong ESL learners with different ages and with a more thorough design. Larger sample size and longer duration of remedial teaching can most possibly contribute to a more reliable and significant result. Furthermore, the gender balance of the study may have to be considered. Regarding the design of the instruments, the choice of words used in the pre-test and post-test should be chosen with careful consideration, such as making reference to the participants' culture and proficiency, or using more high frequency content words, so that the tests are solely for testing pronunciation problems without being affected by the insufficient knowledge in English. Apart from that, in terms of the pronunciation acquisition, in this research, only initial single consonants, vowels, as well as initial two-consonant clusters were involved; therefore, future studies can be done by examining other sounds, such as diphthongs, medial consonants, and triple-consonant clusters, so that the study will be more all-round.

Although Fife-Schaw (2006) argues that quasi-experiments should not be always seen as always inferior to true experiments, it is still believed that the quasi-experimental study design are suitable for examining the effectiveness of interventions in daily practice, and therefore may facilitate the implementation of interventions (Gribbons & Herman, 1997). Thus, future studies adopting a quasi-experimental design are

encouraged in hopes of finding an effective approach to help tackle the common phonemic problems of ESL learners in Hong Kong.

10. Conclusion

The benefits brought by the use of minimal pair approaches in English pronunciation acquisition for ESL learners have long been discussed. Nonetheless, the full use of these approaches has not been made in a specific classroom setting in Hong Kong. As observed and analyzed, it was found that minimal pair approaches are compatible with the teaching in a senior secondary ESL classroom setting, and its effectiveness is positive and prominent. Although it is argued that trivial phonemic problems are to be disregarded, they may also bring about misunderstanding and failure at effective communication. Thus, only through tackling the common phonemic problems of Hong Kong ESL learners, the intelligibility in communication can be enhanced.

In conclusion, this experimental study has considerably raise the students' awareness of discrete sounds of English as well as the importance of making the distinction between confusable sounds in communication; and most importantly, it has confirmed the feasibility and advantages of adopting minimal pair approaches in a Hong Kong senior secondary ESL classroom setting.

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Appendix A

An Overview of English and Cantonese Consonants

Method of articulation	Place of articulation								
	Bilabial	Labio-dental	Dental	Alveolar	Palatal-(post-)alveolar	Palatal	Velar	Labio-velar	Glottal
E Plosives/ Stops	p b			t d			k g		
C	p b			t d			k g	kʷ gʷ	
E Fricatives		f v	θ ð	s z	ʃ ʒ				h
C		f		s					h
E Affricates					tʃ dʒ				
C				ts dz					
E Nasals	m			n			ŋ		
C	m			n			ŋ		
E Lateral				l					
C				l					
E Approxi-mants	w				ɹ	j			
C	w					j			

(Chan & Li, 2010)

Appendix B

The English and Cantonese Vowel Systems

English short vowels (7)	/ɪ, e, æ, ʊ, ɒ, ʌ, ə/
Cantonese short vowels (7)	/i, e, y, u, ɔ, œ, a/
English long vowels (5)	/iː, uː, ɔː, ɑː, ɜː/
Cantonese long vowel (1)	/aː/
English diphthongs (8)	/ɪə, eə, ʊə, eɪ, aɪ, ɔɪ, aʊ, əʊ/
Cantonese diphthongs (10)	/ei, ai, aːi, ɔi, ui, au, aːu, iu, ou, œy/

(Chan, 2009)

Appendix C

Pre-test (p.1)

Instructions:

- Read aloud the following words or sentences according to the sequence. You do not need to read out the item numbers.

- You will not be given any preparation time, so you are just required to read aloud the words spontaneously.

- You may self-correct if you find that you mispronounce a word.

- If some words are not familiar to you, you may try to make them up, or you can say 'SKIP' to pass the words.

- Your performance will be recorded, yet, the results will not be counted as your school academic results.

- If you feel uncomfortable, you can withdraw at any time without negative consequences.

Appendix C (Cont'd)

Pre-test (p.2)

Task 1

1. Boy	2. Chair	3. Dog	4. Fight
5. Game	6. Help	7. Jay	8. Ken
9. Low	10. Moon	11. Night	12. Pick
13. Ring	14. Sad	15. Sure	16. Time
17. Thick	18. These	19. Verb	20. Yet
21. Zoom	22. About	23. Cat	24. Red
25. Let	26. Freeze	27. Bought	28. Kid
29. Mat	30. Lock	31. Court	32. Duck
33. Bird	34. Pull	35. Fit	36. Food
37. Dream	38. Trend	39. Queen	40. Cry
41. Cling	42. Pray	43. Free	44. Brain
45. Green	46. Plan	47. Glow	48. Shred
49. Spin	50. Sky	51. Stay	52. Snap
53. Small	54. Throw	55. Friend	56. Slide
57. Grow			

Appendix C (Cont'd)

Pre-test (p.3)

Task 2

58.	Eat	It	59.	Bin	Bean	60.	Pick	Peak
61.	Fool	Full	62.	Look	Luke	63.	Sit	Seat
64.	Wok	Walk	65.	Caught	Cot	66.	Send	Sand
67.	Man	Men	68.	Bag	Beg	69.	Bed	Bad
70.	Set	Sat	71.	Dad	Dead	72.	Fan	Fen
73.	Pool	Pull	74.	Pan	Pen	75.	Live (v.)	leave
76.	Fit	Feet	77.	Mat	Met	78.	Hill	Heal
79.	This	These	80.	Merry	Marry	81.	Gem	Jam
82.	First	Thirst	83.	Thin	Fin	84.	No	Low
85.	Ways	Raise	86.	Sign	Shine	87.	Zip	Sip
88.	Jane	Chain	89.	Pan	Ban	90.	Sell	Shell
91.	Read	Lead (v.)	92.	Wet	Vet	93.	Load	Road
94.	They	Day	95.	Net	Let	96.	White	Write
97.	Brand	Band	98.	Frame	Fame	99.	Drain	Rain
100.	Class	Glass	101.	Play	Pray	102.	Swim	Slim
103.	Grad	Glad	104.	Blow	Brow	105.	Bling	Bring
106.	Glean	Green	107.	Broom	Bloom	108.	Black	Back
109.	Crowd	Cloud	110.	Shrink	Rink	111.	Drum	Jump
112.	Twin	Tin	113.	Praise	Place	114.	Three	Tree

Appendix C (Cont'd)

Pre-test (p.4)

Task 2 (Cont'd)

115. Dwell	Dell	116. Star	Tar	117. Dread	Dead
118. Stick	Slick	119. Skill	Still	120. Click	Crick
121. Bleed	Breed	122. Skit	Kit	123. Fly	Fry
124. Sweep	Sleep	125. Clash	Crash	126. Thread	Fred

Task 3

127. Can you give me the black bag at your back?

128. Don't let the baby jump on the drum!

129. Can you clean the cage of the cat for me?

130. You need to pay your effort in learning! Don't only play.

131. Many classmates are wearing green glasses in my class.

132. What is the possible ways of raising fund?

133. You are chubby! Don't eat too much junk food.

134. If you continue to swim, you will be slimmer.

135. Wendy loves running on Wednesdays, but not on rainy days.

136. The man turned on the fan and took a rest.

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Appendix D

Marking Scheme of the Pre-test (p.1)

Reminders for the markers:

The highlighted phoneme in each word is the targeted sound to be analysed. Please find the key of the colour coding below:

- Yellow → "single consonants"
- Pink → "vowels"
- Blue → "consonant clusters"

If the targeted sound is correct, put a tick in the bracket against it. If not, put a cross there. You may refer to the International Phonetic Alphabet (IPA) under each word for the correct British pronunciation. Please refer to Cambridge Dictionaries Online (http://dictionary.cambridge.org) for detailed the phonetic notation.

Task 1

1. Boy /bɔɪ/	( )	2. Chair /tʃeəʳ/	( )	3. Dog /dɒg/	( )	4. Fight /faɪt/	( )
5. Game /geɪm/	( )	6. Help /help/	( )	7. Jay /dʒeɪ/	( )	8. Ken /ken/	( )
9. Low /ləʊ/	( )	10. Moon /muːn/	( )	11. Night /naɪt/	( )	12. Pick /pɪk/	( )
13. Ring /rɪŋ/	( )	14. Sad /sæd/	( )	15. Sure /ʃɔːʳ/	( )	16. Time /taɪm/	( )
17. Thick /θɪk/	( )	18. These /ðiːz/	( )	19. Verb /vɜːb/	( )	20. Yet /jet/	( )
21. Zoom /zuːm/	( )	22. About /əˈbaʊt/	( )	23. Cat /kæt/	( )	24. Red /red/	( )
25. Let /let/	( )	26. Freeze /friːz/	( )	27. Bought /bɔːt/	( )	28. Kid /kɪd/	( )
29. Mat /mæt/	( )	30. Lock /lɒk/	( )	31. Court /kɔːt/	( )	32. Duck /dʌk/	( )
33. Bird /bɜːd/	( )	34. Pull /pʊl/	( )	35. Fit /fɪt/	( )	36. Food /fuːd/	( )
37. Dream /driːm/	( )	38. Trend /trend/	( )	39. Queen /kwiːn/	( )	40. Cry /kraɪ/	( )

Appendix D (Cont'd)

Marking Scheme of the Pre-test (p.2)

Task 1 (Cont'd)

41. Cling /klɪŋ/	( )	42. Pray /preɪ/	( )	43. Free /fri:/	( )	44. Brain /breɪn/	( )
45. Green /gri:n/	( )	46. Plan /plæn/	( )	47. Glow /gləʊ/	( )	48. Shred /ʃred/	( )
49. Spin /spɪn/	( )	50. Sky /skaɪ/	( )	51. Stay /steɪ/	( )	52. Snap /snæp/	( )
53. Small /smɔ:l/	( )	54. Throw /θrəʊ/	( )	55. Friend /frend/	( )	56. Slide /slaɪd/	( )
57. Grow /grəʊ/	( )						

Task 2

58.	Eat /i:t/ ( )	It /ɪt/ ( )	59.	Bin /bɪn/ ( )	Bean /bi:n/ ( )	60.	Pick /pɪk/ ( )	Peak /pi:k/ ( )
61.	Fool /fu:l/ ( )	Full /fʊl/ ( )	62.	Look /lʊk/ ( )	Luke /lu:k/ ( )	63.	Sit /sɪt/ ( )	Seat /si:t/ ( )
64.	Wok /wɒk/ ( )	Walk /wɔ:k/ ( )	65.	Caught /kɔ:t/ ( )	Cot /kɒt/ ( )	66.	Send /send/ ( )	Sand /sænd/ ( )
67.	Man /mæn/ ( )	Men /men/ ( )	68.	Bag /bæg/ ( )	Beg /beg/ ( )	69.	Bed /bed/ ( )	Bad /bæd/ ( )
70.	Set /set/ ( )	Sat /sæt/ ( )	71.	Dad /dæd/ ( )	Dead /ded/ ( )	72.	Fan /fæn/ ( )	Fen /fen/ ( )
73.	Pool /pu:l/ ( )	Pull /pʊl/ ( )	74.	Pan /pæn/ ( )	Pen /pen/ ( )	75.	Live /lɪv/ ( )	Leave /li:v/ ( )
76.	Fit /fɪt/ ( )	Feet /fi:t/ ( )	77.	Mat /mæt/ ( )	Met /met/ ( )	78.	Hill /hɪl/ ( )	Heal /hi:l/ ( )
79.	This /ðɪs/ ( )	These /ði:z/ ( )	80.	Merry /ˈmer.i/ ( )	Marry /ˈmær.i/ ( )	81.	Gem /dʒem/ ( )	Jam /dʒæm/ ( )
82.	First /f3:st/ ( )	Thirst /θ3:st/ ( )	83.	Thin /θɪn/ ( )	Fin /fɪn/ ( )	84.	No /nəʊ/ ( )	Low /ləʊ/ ( )
85.	Ways /weɪz/ ( )	Raise /reɪz/ ( )	86.	Sign /saɪn/ ( )	Shine /ʃaɪn/ ( )	87.	Zip /zɪp/ ( )	Sip /sɪp/ ( )

Appendix D (Cont'd)

Marking Scheme of the Pre-test (p.3)

Task 2 (Cont')

88.	Jane /dʒeɪn/	( )	Chain /tʃeɪn/	( )	89.	Pan /pæn/	( )	Ban /bæn/	( )	90.	Sell /sel/	( )	Shell /ʃel/	( )
91.	Read /riːd/	( )	Lead /liːd/	( )	92.	Wet /wet/	( )	Vet /vet/	( )	93.	Load /ləʊd/	( )	Road /rəʊd/	( )
94.	They /ðeɪ/	( )	Day /deɪ/	( )	95.	Net /net/	( )	Let /let/	( )	96.	White /waɪt/	( )	Write /raɪt/	( )
97.	Brand /brænd/	( )	Band /bænd/	( )	98.	Frame /freɪm/	( )	Fame /feɪm/	( )	99.	Drain /dreɪn/	( )	Rain /reɪn/	( )
100.	Class /klɑːs/	( )	Glass /glɑːs/	( )	101.	Play /pleɪ/	( )	Pray /preɪ/	( )	102.	Swim /swɪm/	( )	Slim /slɪm/	( )
103.	Grad /græd/	( )	Glad /glæd/	( )	104.	Blow /bləʊ/	( )	Brow /braʊ/	( )	105.	Bling /blɪŋ/	( )	Bring /brɪŋ/	( )
106.	Glean /gliːn/	( )	Green /griːn/	( )	107.	Broom /bruːm/	( )	Bloom /bluːm/	( )	108.	Black /blæk/	( )	Back /bæk/	( )
109.	Crowd /kraʊd/	( )	Cloud /klaʊd/	( )	110.	Shrink /ʃrɪŋk/	( )	Rink /rɪŋk/	( )	111.	Drum /drʌm/	( )	Jump /dʒʌmp/	( )
112.	Twin /twɪn/	( )	Tin /tɪn/	( )	113.	Praise /preɪz/	( )	Place /pleɪs/	( )	114.	Three /θriː/	( )	Tree /θriː/	( )
115.	Dwell /dwel/	( )	Dell /del/	( )	116.	Star /stɑːʳ/	( )	Tar /tɑːʳ/	( )	117.	Dread /dred/	( )	Dead /ded/	( )
118.	Stick /stɪk/	( )	Slick /slɪk/	( )	119.	Skill /skɪl/	( )	Still /stɪl/	( )	120.	Click /klɪk/	( )	Crick /krɪk/	( )
121.	Bleed /bliːd/	( )	Breed /briːd/	( )	122.	Skit /skɪt/	( )	Kit /kɪt/	( )	123.	Fly /flaɪ/	( )	Fry /fraɪ/	( )
124.	Sweep /swiːp/	( )	Sleep /sliːp/	( )	125.	Clash /klæʃ/	( )	Crash /kræʃ/	( )	126.	Thread /θred/	( )	Fred /fred/	( )

Appendix D (Cont'd)

Marking Scheme of the Pre-test (p.4)

Task 3

127. Can you give me the black bag at your back?

/blæk/ /bæg/ /bæk/

( ) ( ) ( )

128. Don't let the baby jump on the drum!

/dʒʌmp/ /drʌm/

( ) ( )

129. Can you clean the cage of the cat for me?

/kæn/ /kliːn/ /keɪdʒ/ /kæt/

( ) ( )( ) ( ) ( )( )

130. You need to pay your effort in learning! Don't only play.

/niːd/ /peɪ/ /pleɪ/

( ) ( ) ( )

131. Many classmates are wearing green glasses in my class.

/ˈklɑːs.meɪts/ /griːn/ /glɑːsɪs/ /klɑːs/

( ) ( ) ( ) ( )

132. What is the possible ways of raising fund?

/weɪz/ /ˈreɪ.zɪŋ/

( ) ( )

133. You are chubby! Don't eat too much junk food.

/ˈtʃʌb.i/ /iːt/ /tuː/ /mʌtʃ/ /dʒʌŋk/ /fuːd/

( )( ) ( ) ( ) ( ) ( ) ( )

134. If you continue to swim, you will be slimmer.

/swɪm/ /wɪl/ /ˈslɪm.əʳ/

( )( ) ( ) ( )( )

135. Wendy loves running on Wednesdays, but not on rainy days.

/ˈwen.di/ /ˈrʌn.ɪŋ/ /ˈwenz.deɪ/ /ˈreɪ.ni/

( )( ) ( )( ) ( ) ( )

136. The man turned on the fan and took a rest.

/ðə/ /mæn/ /tɜːnd/ /ðə/ /fæn/ /tʊk/ /rest/

( ) ( ) ( ) ( ) ( ) ( ) ( )

Appendix D (Cont'd)

Marking Scheme of the Pre-test (p.5)

Marker: A   /   B

Participant Number:_____

Pre-test Score Table	
Total marks for correct pronunciation of **single consonants**:	( ) / **80**
Total marks for correct pronunciation of **vowels**:	( ) / **80**
Total marks for correct pronunciation of **consonant clusters**:	( ) / **80**
Total marks: ( ) + ( ) + ( ) = ( ) /240	

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Appendix E

Post-test (p.1)

Instructions:

- Read aloud the following words or sentences according to the sequence. You do not need to read out the item numbers.

- You will not be given any preparation time, so you are just required to read aloud the words spontaneously.

- You may self-correct if you find that you mispronounce a word.

- If some words are not familiar to you, you may try to make them up, or you can say 'SKIP' to pass the words.

- Your performance will be recorded, yet, the results will not be counted as your school academic results.

- If you feel uncomfortable, you can withdraw at any time without negative consequences.

Appendix E (Cont'd)

Post-test (p.2)

Task 1

1. Ring	2. Jay	3. These	4. Moon
5. Game	6. Help	7. Chari	8. Yet
9. Zoom	10. Fight	11. Night	12. Pick
13. Boy	14. Sad	15. Sure	16. Verb
17. Thick	18. Dog	19. Time	20. Ken
21. Low	22. Fit	23. Pull	24. Red
25. Food	26. Lock	27. Bird	28. Kid
29. Mat	30. Freeze	31. Court	32. Duck
33. Bought	34. Cat	35. About	36. Let
37. Cry	38. Glow	39. Shred	40. Dream
41. Friend	42. Small	43. Free	44. Brain
45. Green	46. Plan	47. Snap	48. Queen
49. Spin	50. Sky	51. Throw	52. Trend
53. Pray	54. Stay	55. Cling	56. Slide
57. Grow			

Appendix E (Cont'd)

Post-test (p.3)

Task 2

58.	Look	Luke	59.	Bin	Bean	60.	Bed	Bad
61.	Fool	Full	62.	Eat	It	63.	Sit	Seat
64.	Dad	Dead	65.	Pool	Pull	66.	Send	Sand
67.	Man	Men	68.	Bag	Beg	69.	Fit	Feet
70.	Gem	Jam	71.	Wok	Walk	72.	Fan	Fen
73.	Caught	Cot	74.	Pan	Pen	75.	Merry	Marry
76.	Pick	Peak	77.	Mat	Met	78.	Hill	Heal
79.	This	These	80.	Live (v.)	leave	81.	Set	Sat
82.	Sign	Shine	83.	Zip	Sip	84.	Ways	Raise
85.	No	Low	86.	First	Thirst	87.	Thin	Fin
88.	Wet	Vet	89.	White	Write	90.	They	Day
91.	Read	Lead (v.)	92.	Jane	Chain	93.	Load	Road
94.	Sell	Shell	95.	Net	Let	96.	Pan	Ban
97.	Swim	Slim	98.	Praise	Place	99.	Drain	Rain
100.	Class	Glass	101.	Dwell	Dell	102.	Brand	Band
103.	Grad	Glad	104.	Blow	Brow	105.	Skill	Still
106.	Glean	Green	107.	Broom	Bloom	108.	Black	Back
109.	Crowd	Cloud	110.	Shrink	Rink	111.	Drum	Jump
112.	Twin	Tin	113.	Frame	Fame	114.	Three	Tree

Appendix E (Cont'd)

Post-test (p.4)

Task 2 (Cont'd)

115. Play	Pray	116. Stick	Slick	117. Dread	Dead
118. Star	Tar	119. Bling	Bring	120. Click	Crick
121. Bleed	Breed	122. Thread	Fred	123. Fly	Fry
124. Sweep	Sleep	125. Clash	Crash	126. Skit	Kit

Task 3

127. You need to pay your effort in learning! Don't only play.
128. Wendy loves running on Wednesdays, but not on rainy days.
129. Can you clean the cage of the cat for me?
130. Can you give me the black bag at your back?
131. Many classmates are wearing green glasses in my class.
132. Don't let the baby jump on the drum!
133. You are chubby! Don't eat too much junk food.
134. What is the possible ways of raising fund?
135. If you continue to swim, you will be slimmer.
136. The man turned on the fan and took a rest.

References

Chan, A.Y.W. (2009). Helping Cantonese ESL learners overcome their difficulties in the production and perception of English speech sounds. English Language Teaching World Online: Voices from the Classroom, 1.

Chan, A.Y.W. (2011). The perception of English speech sounds by Cantonese ESL learners in Hong Kong. TESOL Quarterly, 45(4), 718-748.

Appendix F

Marking Scheme of the Post-test (p.1)

Reminders for the markers:

The highlighted phoneme in each word is the targeted sound to be analysed. Please find
the key of the colour coding below:

- Yellow → "single consonants"
- Pink → "vowels"
- Blue → "consonant clusters"

If the targeted sound is correct, put a tick in the bracket against the word. If not, put a
cross there. You may refer to the International Phonetic Alphabet (IPA) under each word
for the correct British pronunciation. Please also refer to Cambridge Dictionaries Online
(http://dictionary.cambridge.org) for detailed the phonetic notation.

Task 1

1. Ring /rɪŋ/	( )	2. Jay /dʒeɪ/	( )	3. These /ði:z/	( )	4. Moon /mu:n/	( )
5. Game /geɪm/	( )	6. Help /help/	( )	7. Chair /tʃeəʳ/	( )	8. Yet /jet/	( )
9. Zoom /zu:m/	( )	10. Fight /faɪt/	( )	11. Night /naɪt/	( )	12. Pick /pɪk/	( )
13. Boy /bɔɪ/	( )	14. Sad /sæd/	( )	15. Sure /ʃɔːr/	( )	16. Verb /vɜ:b/	( )
17. Thick /θɪk/	( )	18. Dog /dɒg/	( )	19. Time /taɪm/	( )	20. Ken /ken/	( )
21. Low /ləʊ/	( )	22. Fit /fɪt/	( )	23. Pull /pʊl/	( )	24. Red /red/	( )
25. Food /fu:d/	( )	26. Lock /lɒk/	( )	27. Bird /bɜ:d/	( )	28. Kid /kɪd/	( )
29. Mat /mæt/	( )	30. Freeze /fri:z/	( )	31. Court /kɔ:t/	( )	32. Duck /dʌk/	( )
33. Bought /bɔ:t/	( )	34. Cat /kæt/	( )	35. About /əˈbaʊt/	( )	36. Let /let/	( )
37. Cry /kraɪ	( )	38. Glow /gləʊ/	( )	39. Shred /ʃred/	( )	40. Dream /dri:m/	( )

Appendix F (Cont'd)

Marking Scheme of the Post-test (p.2)

Task 1 (Cont'd)

41. Friend /frend/ ( )	42. / Small /smɔːl/ ( )	43. Free /friː/ ( )	44. Brain /breɪn/ ( )
45. Green /ɡriːn/ ( )	46. Plan /plæn/ ( )	47. Snap /snæp/ ( )	48. Queen /kwiːn/ ( )
49. Spin /spɪn/ ( )	50. Sky /skaɪ/ ( )	51. Throw /θrəʊ/ ( )	52. Trend /trend/ ( )
53. Pray /preɪ/ ( )	54. Stay /steɪ/ ( )	55. Cling /klɪŋ/ ( )	56. Slide /slaɪd/ ( )
57. Grow /ɡrəʊ/ ( )			

Task 2

58.	Look /lʊk/ ( )	Luke /luːk/ ( )	59.	Bin /bɪn/ ( )	Bean /biːn/ ( )	60.	Bed /bed/ ( )	Bad /bæd/ ( )
61.	Fool /fuːl/ ( )	Full /fʊl/ ( )	62.	Eat /iːt/ ( )	It /ɪt/ ( )	63.	Sit /sɪt/ ( )	Seat /siːt/ ( )
64.	Dad /dæd/ ( )	Dead /ded/ ( )	65.	Pool /puːl/ ( )	Pull /pʊl/ ( )	66.	Send /send/ ( )	Sand /sænd/ ( )
67.	Man /mæn/ ( )	Men /men/ ( )	68.	Bag /bæg/ ( )	Beg /beg/ ( )	69.	Fit /fɪt/ ( )	Feet /fiːt/ ( )
70.	Gem /dʒem/ ( )	Jam /dʒæm/ ( )	71.	Wok /wɒk/ ( )	Walk /wɔːk/ ( )	72.	Fan /fæn/ ( )	Fen /fen/ ( )
73.	Caught /kɔːt/ ( )	Cot /kɒt/ ( )	74.	Pan /pæn/ ( )	Pen /pen/ ( )	75.	Merry /ˈmer.i/ ( )	Marry /ˈmær.i/ ( )
76.	Pick /pɪk/ ( )	Peak /piːk/ ( )	77.	Mat /mæt/ ( )	Met /met/ ( )	78.	Hill /hɪl/ ( )	Heal /hiːl/ ( )
79.	This /ðɪs/ ( )	These /ðiːz/ ( )	80.	Live /lɪv/ ( )	Leave /liːv/ ( )	81.	Set /set/ ( )	Sat /sæt/ ( )
82.	Sign /saɪn/ ( )	Shine /ʃaɪn/ ( )	83.	Zip /zɪp/ ( )	Sip /sɪp/ ( )	84.	Ways /weɪz/ ( )	Raise /reɪz/ ( )
85.	No /nəʊ/ ( )	Low /ləʊ/ ( )	86.	First /fɜːst/ ( )	Thirst /θɜːst/ ( )	87.	Thin /θɪn/ ( )	Fin /fɪn/ ( )

Appendix D (Cont'd)

Marking Scheme of the Post-test (p.3)

Task 2 (Cont'd)

88.	Wet /wet/	( )	Vet /vet/	( )	89.	White /waɪt/	( )	Write /raɪt/	( )	90.	They /ðeɪ/	( )	Day /deɪ/	( )
91.	Read /riːd/	( )	Lead /liːd/	( )	92.	Jane /dʒeɪn/	( )	Chain /tʃeɪn/	( )	93.	Load /ləʊd/	( )	Road /rəʊd/	( )
94.	Sell /sel/	( )	Shell /ʃel/	( )	95.	Net /net/	( )	Let /let/	( )	96.	Pan /pæn/	( )	Ban /bæn/	( )
97.	Swim /swɪm/	( )	Slim /slɪm/	( )	98.	Praise /preɪz/	( )	Place /pleɪs/	( )	99.	Drain /dreɪn/	( )	Rain /reɪn/	( )
100.	Class /klɑːs/	( )	Glass /glɑːs/	( )	101.	Dwell /dwel/	( )	Dell /del/	( )	102.	Brand /brænd/	( )	Band /bænd/	( )
103.	Grad /græd/	( )	Glad /glæd/	( )	104.	Blow /bləʊ/	( )	Brow /braʊ/	( )	105.	Skill /skɪl/	( )	Still /stɪl/	( )
106.	Glean /gliːn/	( )	Green /griːn/	( )	107.	Broom /bruːm/	( )	Bloom /bluːm/	( )	108.	Black /blæk/	( )	Back /bæk/	( )
109.	Crowd /kraʊd/	( )	Cloud /klaʊd/	( )	110.	Shrink /ʃrɪŋk/	( )	Rink /rɪŋk/	( )	111.	Drum /drʌm/	( )	Jump /dʒʌmp/	( )
112.	Twin /twɪn/	( )	Tin /tɪn/	( )	113.	Frame /freɪm/	( )	Fame /feɪm/	( )	114.	Three /θriː/	( )	Tree /θriː/	( )
115.	Play /pleɪ/	( )	Pray /preɪ/	( )	116.	Stick /stɪk/	( )	Slick /slɪk/	( )	117.	Dread /dred/	( )	Dead /ded/	( )
118.	Star /stɑːʳ/	( )	Tar /tɑːʳ/	( )	119.	Bling /blɪŋ/	( )	Bring /brɪŋ/	( )	120.	Click /klɪk/	( )	Crick /krɪk/	( )
121.	Bleed /bliːd/	( )	Breed /briːd/	( )	122.	Thread /θred/	( )	Fred /fred/	( )	123.	Fly /flaɪ/	( )	Fry /fraɪ/	( )
124.	Sweep /swiːp/	( )	Sleep /sliːp/	( )	125.	Clash /klæʃ/	( )	Crash /kræʃ/	( )	126.	Skit /skɪt/	( )	Kit /kɪt/	( )

Appendix F (Cont'd)

Marking Scheme of the Post-test (p.4)

Task 3

127. You need to pay your effort in learning! Don't only play.

/niːd/ /peɪ/ /pleɪ/

( ) ( ) ( )

128. Wendy loves running on Wednesdays, but not on rainy days.

/ˈwen.di/ /ˈrʌn.ɪŋ/ /ˈwenz.deɪ/ /ˈreɪ.ni

( )( ) ( )( ) ( ) ( )

129. Can you clean the cage of the cat for me?

/kæn/ /kliːn/ /keɪdʒ/ /kæt/

( ) ( )( ) ( ) ( )( )

130. Can you give me the black bag at your back?

/blæk/ /bæg/ /bæk/

( ) ( ) ( )

131. Many classmates are wearing green glasses in my class.

/ˈklɑːs.meɪts/ /griːn/ /glɑːsɪs/ /klɑːs/

( ) ( ) ( ) ( )

132. Don't let the baby jump on the drum!

/dʒʌmp/ /drʌm/

( ) ( )

133. You are chubby! Don't eat too much junk food.

/ˈtʃʌb.i/ /iːt/ /tuː/ /mʌtʃ/ /dʒʌŋk/ /fuːd/

( )( ) ( ) ( ) ( ) ( ) ( )

134. What is the possible ways of raising fund?

/weɪz/ /ˈreɪ.zɪŋ/

( ) ( )

135. If you continue to swim, you will be slimmer.

/swɪm/ /wɪl/ /ˈslɪm.əʳ/

( )( ) ( ) ( )( )

136. The man turned on the fan and took a rest.

/ðə/ /mæn/ /tɜːnd/ /ðə/ /fæn/ /tʊk/ /rest/

( ) ( ) ( ) ( ) ( ) ( ) ( )

Appendix F (Cont'd)

Marking Scheme of the Post-test (p.5)

Marker: A   /   B

Participant Number:_____

Post-test Score Table	
Total marks for correct pronunciation of **single consonants**:	( ) / **80**
Total marks for correct pronunciation of **vowels**:	( ) / **80**
Total marks for correct pronunciation of **consonant clusters**:	( ) / **80**
Total marks: ( ) + ( ) + ( ) = ( ) /**240**	

References

Chan, A.Y.W. (2009). Helping Cantonese ESL learners overcome their difficulties in the production and perception of English speech sounds. English Language Teaching World Online: Voices from the Classroom, 1.

Chan, A.Y.W. (2011). The perception of English speech sounds by Cantonese ESL learners in Hong Kong. TESOL Quarterly, 45(4), 718-748.

Appendix G

Instructional Material: Listening Task without Context

Explanation about the listening task

1. The students have to first practise reading the minimal pairs with their partner.

2. They then have to listen to the teacher and circle the correct word.

3. The teacher will go through the answers with students by picking students to read aloud the answers. The teacher will also point out the distinction between each pair and ask the whole class to read aloud each pair.

The worksheet for the listening task

Instructions:
1) Practise each pair of words with your partner.
2) Listen to the teacher. Circle the words read by the teacher.

1.	Thick	Sick
2.	Ferry	Very
3.	They	Day
4.	Lot	Not
5.	Ride	Wide
6.	Tank	Thank
7.	See	She
8.	Wheel	Reel
9.	Best	Vest
10.	Think	Fink

Appendix H

Instructional Material: Listening Task with Context

Explanation about the listening task

1. The students have to first practise reading the minimal pairs in each question with their partner.

2. They then have to listen to the teacher and circle the correct word.

3. The teacher will go through the answers with students by picking students to read aloud the answers. The teacher will also point out the distinction between each pair and ask the whole class to read aloud each pair.

The worksheet for the listening task

Instructions:
1) Practise each pair of words with your partner.
2) Listen to the teacher. In each question, circle the word read by the teacher.

|		A	B
1.	I can't _____ without it.	live	leave
2.	He _____ me on the leg.	bit	beat
3.	There's nothing to _____.	eat	it
4.	I can't find the _____ anywhere.	lid	lead
5.	He emptied the _____ all over the floor.	bins	beans
6.	I wanted _____ in the garden.	to sit	a seat
7.	Peter had the _____.	list	least
8.	Don't _____ on the floor.	slip	sleep

(Hewings, 2004, p.57)

Appendix I

Instructional Material: Classification Task

Explanation about the classification task

1. The teacher first asks the students to differentiate the difference between 'seat' and 'sit'.

2. When the activity starts, the teacher reads aloud a list of words: eat, it, peak, pick, feet, fit, read, rid, feel, fill, beat, bit, deed, did, lead and lid.

3. The students have to listen to the words carefully and put the words into the correct group (long vowels vs. short vowels) on the worksheet.

4. The teacher will go through the answers with students by picking students to read aloud the answers. The teacher will also point out the distinction between each pair and ask the whole class to read aloud each pair.

The worksheet for the classification task

Instructions:
Listen to the teacher. Put the words you hear into the correct groups below by identifying whether they have **a long or short vowel**.

seat

sit
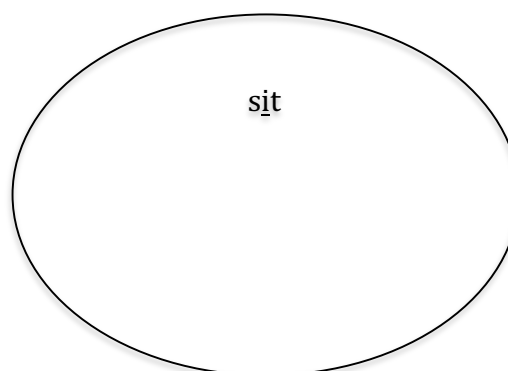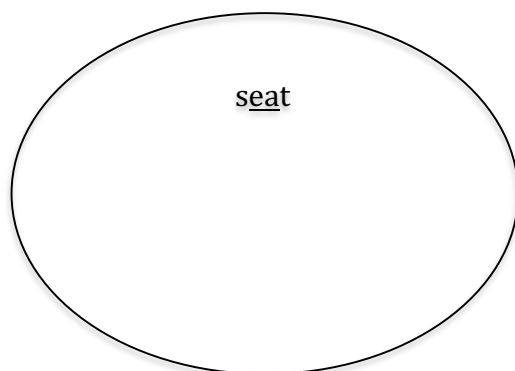
Appendix J

Instructional Material: Bingo Game

Explanation about the "Bingo" game

1. The teacher selects some words in the following list and reads aloud those words one by one, twice for each. For example, the teacher may say *'Number one, "fund", "fund". Number two, "lock", "lock"...'*

- hill vs. heel   - luck vs. lock

- letter vs. litter   - fill vs. feel

- work vs. walk   - nut vs. not

- sit vs. seat   - fund vs. fond

- desk vs. disk   - pest vs. past

- so vs. saw   - Reach vs. rich

- ship vs. sheep

2. The students have to circle the word they hear and mark down the item number next to it.

3. If a student has circled five words horizontally, vertically or diagonally, he/she has to shout out "Bingo".

4. The teacher will invite that student to read aloud the circled words according to the item numbers.

5. The teacher has to check whether the student read the words correctly, if yes, a small gift will be given as positive reinforcement.

Appendix J (Cont'd)

Remedial Teaching Material – Bingo Game

The "Bingo" card for the activity

Listen carefully!				
not	heel	seat	ship	sheep
rich	pest	nut	reach	feel
disk	walk	letter	desk	past
fond	sit	hill	work	litter
fill	lock	so	saw	fund

Each student will receive a "Bingo" card with different word arrangement.

Appendix K

Instructional Martial: PowerPoint for Minimal Pairs Reading Task

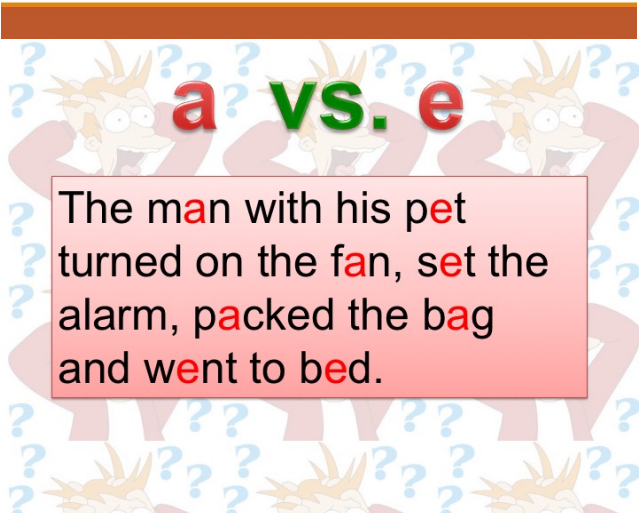|	
a vs. e 1. Jacky Jecky 2. Jerry Jarry 3. Kelvin Kalvin	**<u>Explanation about the minimal pairs reading task</u>** 1. With the use of the PowerPoint slides (see an example on the left), the teacher demonstrates how to read the minimal pairs, and asks students to follow to make correct pronunciation. 2. The teacher also points out the difference in sounds in the minimal pairs explicitly. 3. The minimal pairs used are related to students' daily life, so that they will be more motivated to learn. 4. This example on the left makes use of students' names to illustrate the difference in sounds. The students may find it interesting and started to be aware of the pronunciation when they are calling others' names.

Appendix L

Instructional Material: Picture-word Induction Task

Explanation about the picture-word induction task

5. With the use of the PowerPoint slides (see examples on the left), the teacher shows the pictures to students, without showing the words.

6. The teacher picks students to describe the pictures in each slide.

7. The teacher shows the name of the items in the pictures and guides students to read aloud the minimal pairs.

8. The teacher also has to explicitly points out the difference between the distinct sounds in the two words.

Appendix M

Instructional Material: Tongue Twister Challenge

Thirty-three Finns found thirty free things. Did thirty-three Finns find thirty free things? If thirty-three Finns found thirty free things, How many free things did thirty-three Finns find? Retrieved from http://www.musicalenglishlessons.org/sayings/trickytonguetwisters.htm a vs. e The man with his pet turned on the fan, set the alarm, packed the bag and went to bed.	**<u>Explanation about the tongue twister challenge</u>** 1. With the use of the PowerPoint slides (see two examples on the left), the teacher shows some tongue twisters which involve confusable sounds. 2. The students practise with their partner. 3. The teacher holds a small competition. The students have to read aloud the twister accurately. The student who can read aloud the tongue twister most accurately and in the shortest time will win the competition. 4. A small gift will be rewarded to the winner as positive reinforcement.

Appendix N

Instructional Material: Short Story Writing Task

Explanation about the short story writing task

1. The students have to work in groups of four.

2. Each group will be given a slip of paper with some minimal pairs written on it.

3. Each group will receive a different slip. They have to make up a short story (about 50 words) by making use of all the words on the slip.

4. Each group will be invited to read aloud the story for the whole class.

5. By showing the story under the visualizer, the whole class can read aloud the work done by all the groups.

6. The teacher gives guidance and suggestions throughout the whole activity. He or she also points out some distinction between words when necessary.

Slips of paper for the writing task

1	bag, beg, pick, peek
2	well, yell, ride, wide
3	bell, ball, map, mop
4	bean, bin, full, fool
5	fly, fry, bloom, boom
6	crave, cave, please, peace

Appendix O

Instructional Material: Pair Practice Activity

Explanation about the pair practice activity

1. The students have to work in pairs.

2. Each student in each pair, namely "Student A" and "Student B", receive a
   different worksheet.

3. They have to follow the instructions on the worksheet and work with their partner.

4. At the end, they can review the answers to their partner.

5. During the activity, the teacher walks around to check if students are producing
   correct pronunciation, or circling the correct words.

Appendix P (Cont'd)

Remedial Teaching Material – Pair Practice Activity

Worksheet for the pair practice activity

STUDENT A	STUDENT B
Part 1	**Part 1**
Read sentences 1-5 to your partner.	Circle the word that your partner reads.
1. He gave me a hug.	1. He gave me a _____.
2. Hand me the pin.	(a) hug
3. The room is full of cats.	(b) hog
4. It's very withered.	
5. The men will come soon.	2. Hand me the _____.
	(a) pen
	(b) pin
Part 2	
Circle the word that your partner reads.	3. The room is full of _____.
	(a) cots
6. I'd like to see that _____.	(b) cats
(a) chick	
(b) check	4. It's very _____.
	(a) withered
7. That's my _____.	(b) weathered
(a) luck	
(b) lock	5. The _____ will come soon.
	(a) man
8. They _____ around.	(b) men
(a) spun	
(b) spin	**Part 2**
	Read sentences 6-10 to your partner.
9. I fell over the _____.	
(a) rock	6. I'd like to see that chick.
(b) rack	7. That's my lock.
	8. They spun around.
10. They _____ weights at the gym.	9. I fell over the rock.
(a) lift	10. They left weights at the gym.
(b) left	

(Celce-Murcia, Brinton, & Goodwin, 1996, p. 117)