Minimal Contrast Approach and English Error Pronunciation Skills of Thai Parents[1]

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Abstract

The aim of this investigation was to examine the significant differences between pretest and posttest results of the Minimal Contrast Approach (MCA) in enhancing the pronunciation of English error sounds among Thai native parents. Employing a multistage sampling method, fifteen actively engaged Thai native parents in the Home Literacy Environment (HLE) were selected, adhering to specific inclusion criteria. The instruments were the pretest and posttest, with a total of 2,520 minimal contrast tokens, and 7 Minimal Contrast Approach (MCA) lessons, along with corresponding learning materials for the common English error phonemes among Thais (e.g., /r/, /v/, /θ/, /z/, /ʃ/, /tʃ/, and /dʒ/). The Pronunciation Percent of Correct (PPC) was set at 66.67% as the benchmark for accurate pronunciation. The PPC scores from both the pretest and posttest were analyzed using the Paired Sample T-test. The findings revealed a statistically significant difference ($p < .05$) in improvement among the participants' productions. This indicates the potential of being a beneficial approach to improve pronunciation skills at the phoneme level of Thai parents, not solely among children or students. This study serves as preparation for Thai parents interested in implementing Home English Literacy Environment (HELE) for their young children.

Keywords: minimal contrast approach, English pronunciation skills, Thai parents, English phonemes

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Introduction

Systematic reviews indicate that the Minimal Contrast Approach (MCA), also known as the conventional minimal pair approach, is commonly related to two fields of study: clinical and educational studies. Clinical intervention studies focus on Speech Sound Disorders (SSD) in monolingual children aged between 3-7 years old with SSD (Storkel, 2021; Combiths et al., 2019; Dodd et al., 2008; Barlow & Gierut, 2002). Additionally, educational studies involve pronunciation skills in typical children and students across various age groups, from young children to university students (Utkir qizi & Sherali qizi, 2021; Kumprom, 2018; Ketkumbonk & Woragittanont, 2017; Altamimi, 2015). The approach is known by various names in different fields, such as the minimal pair approach in education and the minimal opposition intervention approach in speech-language pathology (SLP).

According to Gierut (1992), and Barlow & Gierut (2002), a minimal contrast refers to a single or only one or two phoneme feature differences which indicate in different meanings. The selection of sound contrast in word pairs is based on three linguistic dimensions: (a) the number of distinctive contrasts, (b) the nature or type of contrasts, and (c) the relation of treated phonemes to the child's pretreatment grammar. The number of distinctive contrasts, firstly, refers to a single or two numbers of places, manners, voices or in non-major class in linguistically featural differences that create a contrast between phonemes of a certain language. For instance, /p/ can generally be paired with /b/ in word pairs such as pin [pɪn] -bin [bɪn] and pan [pæn]- ban [bæn]. This is because there is only a single or a small number of voicings featural distinctions. Secondly, the nature or type of contrast involves major or non-major class distinctions between two contrastive phonemes. Barlow and Gierut uniquely describe and distinguish major class distinctions such as consonants vs vowels, obstruents vs sonorants, and glides vs consonants. The featural distinctions that mark this contrast are obstruents vs sonorants. For example, /t/ can be paired with /s/ in word pairs like tip [tɪp]- sip [sɪp], and toy [tɔɪ]–soy [sɔɪ] because /t/ and /s/ belong to the obstruents class but differ in manners. The minimal pair words (target and treated sounds) must belong to the same major class distinctions, avoiding the crossing of major classes between the two contrastive phonemes. The final description, the relationship of treated phonemes to the child's pretreatment grammar refers to the treated phonemes may be unknown sounds in the child's existing sound system. The unknown and another know sounds are paired which can be either formed minimal, maximal contrasts, and another types of contrast. In English

sounds in this study, the treated or error phoneme is explicitly contrasted with the participant's existing sound system in their native language, such as Thai sounds like /p/, /b/, /t/, /d/, /s/, /n/, and /k/. The treated sounds: /r/, /v/, /Ө/, /z/, /ʃ/, /tʃ/ and /dʒ/, do not exist in the Thai sound system, obstructing the learning of English pronunciation skills.

Thai learners, including a group of parents who are non-native English learners, often encounter pronunciation difficulties, especially at the phoneme level, when trying to support their children's English learning at home. Some English sounds are accurately pronounced by Thai learners due to similarities between the English and Thai sound systems, such as /p/, /b/, /t/, /d/, /s/, /n/, and /k/, representing positive transfer (Altamimi, 2015; Helfenstein, 2005). On the other hand, sounds like /r/, /v/, /Ө/, /z/, /ʃ/, /tʃ/ and /dʒ/, considered errors, are inaccurately pronounced by native Thais because they do not exist in their native language (Tanthanis, 2013). Given these challenges, the MCA is designed to support English pronunciation learners by emphasizing the contrast between sounds that can be pronounced (target sounds) and those that are challenging (error sounds). The approach aims to leverage positive transfer between the two languages.

With the three dimensions of the MCA outlined by Barlow and Gierut, adults can explicitly and effectively learn the rules of distinctive features. According to Steinberg and Sciarini (2006), individual intellectual factors vary among different age groups. Explication, or the detailed explanation of concepts, plays a significant role in adult learning within the classroom situation, and this ability tends to increase with age. Therefore, adults are expected to find greater ease in understanding abstract and complex explanations related to second language learning in the classroom setting.

As previously mentioned, the majority of the MCA studies have been conducted among children and school-aged groups, both with and without speech impairments, with limited focus on training adults. In Thailand, studies related to parent training are prevalent in various clinical trials and public health areas, but they are less explored in the realms of education or language development. Furthermore, there is a scarcity of studies focusing on English-speaking adults, particularly parents who aim to develop their children's language skills at home. Consequently, the objective of this study is to enhance the English pronunciation skills of Thai parents using MCA, which contributes to their role in supporting the home English literacy environment.

Objectives

The objective was to examine the statistically significant differences between pretest and posttest results in English sound error pronunciation among Thai native parents using the Minimal Contrast Approach (MCA).

Materials and Methods

1. Research Design

This study is the quasi-experimental research of the one group pretest – posttest design. The 2,520 minimal contrast tokens were used to evaluate pronunciation level on the pretest and posttest individuals among the fifteen participants. They were further analyzed in the data analysis based on the linguistics research procedures.

2. Participants

The participants of the study were a group of Thai parents specified as native Thai speakers. They could be a father, mother, or a guardian appointed by the child's parent or legal guardian. Guardians could include grandparents, uncles, aunts, or older siblings. Participants were selected using a multi-stage sampling method. Initially, three primary schools in Muang, Uttaradit province, were targeted through convenience sampling: Uttaradit Demonstration School, Uttaradit Christian Kindergarten School, and Klong Pho Municipal School. A total of 600 parents were included in the primary selection stage. In the 2nd stage, the fifty-five voluntary parents with their children voluntarily enrolled and completed the survey of background information and home literacy environment behaviors by the purposive sampling method. After completing the sampling collection survey with a five-point scale, the fifteen parents met the inclusion criteria at the moderate – highest levels of these following dimensions: (a) background information of SES, e.g., ages, family members, educational levels, occupations, and incomes, (b) The parents' attitudes towards English, (c) parents' self-efficacy of HLE and teaching children at home, (d) HLE activities and frequencies of conducting the activities a week, (e) numbers of home literacy resources, and (f) the abilities of children's native communication, and oral skills. This study was permitted by University of Phayao Human Ethic Committee to protect the participants.

3. Minimal Contrast Tokens (MCTs)

The Minimal Contrast Tokens (MCTs) were selected based on linguistically distinctive feature characteristics. The targeted sounds /r/, /v/, /θ/, /z/, /ʃ/, /tʃ/, and /ʤ/ are commonly identified as problematic in the pronunciation of Thai-English learners by relevant researchers (Tanthanis, 2013). However, the sounds /ð/ and /ʒ/, which also do not exist in Thai, were excluded from the tokens because they are generally found in abstract words such as "that" [ðæt], "than" [ðæn], "usual" [juːʒʊəl], and "pleasure" [pleʒər]. Additionally, the number of tokens pairing these sounds as minimal pairs was limited, and they were deemed too advanced for young children, according to instrument assessment experts specializing in kindergarten students. The selection of target errors using Minimal Contrast Analysis (MCA) follows the framework of linguistically distinctive features proposed by Barlow and Gierut (2002). These features are categorized into major and non-major classes. In this study, each MCA pair consisted of one or two distinctive features that did not cross sound classes. Both sounds of each pair were placed in initial, medial, and final consonant positions, with 17 pairs, 1 pair, and 10 pairs, respectively.

Table 1 Minimal contrast tokens (MCT)

Phoneme contrasts	Minimal contrasts (4 pairs)			
Lesson 1 /n - r/	nail – rail	nope – rope	nun – run	night – right
Lesson 2 /f - v/	wolf - wolve	fine - vine	fife – five	leaf - leave
Lesson 3 /t - θ /, /s – θ/	tank – thank	part – path	sick – thick	mouse - mouth
Lesson 4 /d - z /, /s – z/	doom – zoom	bus – buzz	lacy – lazy	mace - maize
Lesson 5 /k - ʃ/, /s - ʃ/, /t - ʃ/	cake – shake	book – bush	sock – shock	hut – hush
Lesson 6 /p - tʃ/, /t - tʃ/,	pop – chop	pair – chair	two – chew	cat - catch
Lesson 7 /g - ʤ/, /b- ʤ/	get – jet	goose – juice	bump – jump	boy – joy

The treated and target sounds were selected and paired according to these three specific criteria and limitations: (a) adherence to the framework of linguistically distinctive features proposed by Barlow and Gierut (2002). For instance, /n/ and /r/ were paired because they are sonorants classified under the major class, (b) the MCA tokens had to correspond to concrete nouns presented in three children's storybooks, which were depicted as picture to assist in reading activity in the HELE with young children, and (c) due to the constraints of pairing words,

the sample sound of /n/ and /r/ offered more word choices than /l/ and /r/. This consideration was applied to other sound pairs as well.

Table 2 Minimal contrast tokens (MCTs) and linguistically distinctive features

No	Phonemes	Minimal contrast pairs				Major class		Nonmajor class															voicing		Numbers of distinctive features
						Obstruent	Sonorant	Stop	Fricative	Affricate	Nasal	Liquid	Glide	Bilabial	Labiodent	Interdental	Alveolar	Palato	Palatal	Velar	Glotta	VL	V	
1	/n/	nail	nope	nun	night		√				√*						√**						√	2
	/r/	rail	rope	run	right		√					√*							√**				√	
2	/f/	wolf	fine	fife	leaf	√			√						√							√*		1
	/v/	wolve	vine	five	leave	√			√						√								√*	
3	/t/	tank	part			√		√*									√**					√		2
	/θ/	thank	path			√			√*							√**						√		
	/s/	sick	mouse			√			√								√*					√		1
	/θ/	think	mouth			√			√							√*						√		
4	/d/	doom				√		√*									√						√	1
	/z/	zoom				√			√*								√						√	
	/s/	bus	lacy	mace		√			√								√					√*		1
	/z/	buzz	lazy	maize		√			√								√						√*	
5	/k/	cake	book			√		√												√**		√		2
	/ʃ/	shake	bush			√			√*									√**				√		
	/s/	sock				√			√								√*					√		1
	/ʃ/	shock				√			√									√*				√		
	/t/	hut				√		√*									√**					√		2
	/ʃ/	hush				√			√*									√**				√		
6	/p/	pop	pair			√		√*						√**								√		2
	/tʃ/	chop	chair			√				√*								√**				√		
	/t/	two	cat			√		√*									√**					√		2
	/tʃ/	chew	catch			√				√*								√**				√		
7	/g/	get	goose			√		√*												√**			√	2
	/dʒ/	jet	juice			√				√*								√**					√	
	/b/	bump	boy			√		√*						√**									√	2
	/dʒ/	jump	joy			√				√*								√**					√	

Note: * means the 1st distinction, **means the 2nd distinction

4. The Number of Pairs and Tokens

Twenty-eight pairs, or fifty-six tokens, were pronounced three times by the fifteen participants. This results in a total of 2,520 pronunciations (7 sounds × 8 tokens of each sound × 3 repetitions × 15 participants).

5. Research Instruments

The two research instruments were used in the study: (a) The pretest and posttest of MCA, and (b) The seven MCA lesson plans as these following details.

1) The pretest and posttest of voice recordings were conducted based on the types and number of contrastive differences outlined by Barlow and Gierut in 2002, 1992.

2) The seven MCA lesson plans of the 2W3P teaching method (Warm up, Presentation, Practice, Production, and Wrap up) by Angwatanakul (1994) and learning materials including seven MCA lessons of PowerPoints and exercises, and the MP3 recordings of American English native speaker voices.

The validity of the research instruments was verified by a board comprised of five experts from three different fields. These experts, each with at least five years of experience, included two experts in English linguistics, two experts in early childhood education, and one expert in educational measurement and evaluation.

6. Data Collection

The procedures were designed into two types of training because of the voluntary participants' convenience and their time allocations: (a) two days of onsite training at Uttaradit Demonstration school on the 1st weekend of August 2023 between 9.30 a.m.-3.00 p.m. with eight participants (P2, P5, P6, P7, P8, P13, P14, P15) and (b) seven days of online training by Zoom Meeting programs on the 2nd week of August 2023 between 7.30 a.m.-8.30 p.m. (five days and two days of pretest and posttest (thirty minutes each) with seven participants (P1, P3, P4, P9, P10, P11, P12). The teaching procedures were restricted to the MCA intervention and the 2W3P teaching method, teaching materials, and the instructions were controlled under the similar procedures as the table 3 and 4 illustrated.

Table 3 Two days of onsite training

Days	Duration	Lessons & activities	Lengths
Day 1	9.30-10.00 a.m.	Pretest	30 minutes
	10.00 – 11.00 a.m.	Lesson 1 /r/	1 hour
	11.00 – 12.00 a.m.	Lesson 2 /v/	1 hour
	1.00 – 2.00 p.m.	Lesson 3 /ɵ/	1 hour
	2.00 – 3.00 p.m.	Lesson 4 /z/	1 hour
Day 2	9.30 – 10.30 a.m.	Lesson 5 /ʃ/	1 hour
	10.30 – 11.30 a.m.	Lesson 6 /tʃ/	1 hour
	1.30 – 2.30 p.m.	Lesson 7 /dʒ/	1 hour
	2.30 – 3.00 p.m.	Posttest	30 minutes

Table 4 Seven days of online training

Days	Duration	Lessons & activities	Lengths
Day 1	7.00 – 7.30 p.m.	Pretest	30 minutes
	7.30 – 8.30 p.m.	Lesson 1 /r/	1 hour
Day 2	7.30 – 8.30 p.m.	Lesson 2 /v/	1 hour
Day 3	7.30 – 8.30 p.m.	Lesson 3 /ɵ/	1 hour
Day 4	7.30 – 8.30 p.m.	Lesson 4 /z/	1 hour
Day 5	7.30 – 8.30 p.m.	Lesson 5 /ʃ/	1 hour
Day 6	7.30 – 8.30 p.m.	Lesson 6 /tʃ/	1 hour
Day 7	6.00 – 7.00 p.m.	Lesson 7 /dʒ/	1 hour
	7.00 – 7.30 p.m.	Posttest	30 minutes

7. The Participants' Voice Recording

There were two types of training in the study, however, for pretest and posttest voice recordings, they were implemented under the same procedures. The participants recorded the pretest and posttest via voice recorder applications (Voice Memos with IOS and Awesome Voice Recorder with Android) and the mono track was applied to create the MP3 voice recording files for both trainings. Each participant recorded the 168 MCA test tokens in the pretest and posttest individually (7 sounds X 4 pairs or 8 words X 3 times pronounced = 168 tokens / a participant).

Consequently, the 2,520 test tokens pronounced by fifteen participants were evaluated in the data analysis process.

The MCA test tokens were displayed on the screen using the Zoom Meeting Program for online training, while the hands-on sheets were utilized for onsite training. In both trainings, the recording instructions and related steps were similarly guided by the researcher.

8. Data Analysis

The data collected from the 2,520 test tokens were assessed by three linguistic experts: an English lecturer from the English Program, and one from the English education program, along with an American English native speaker. Each pronunciation underwent evaluation by three assessors as inter-raters based on the PPC criteria (Percent of Phoneme Correct), set at 66.67%, indicating accurate pronunciation.

The evaluators assessed phoneme accuracy in accordance with the linguistically distinctive characteristics of places, manners of articulation, and voicing as outlined by Barlow and Gierut in 2002. For instance, in the case of the first pronunciation (out of three times of pronunciation) of the word 'run,' The evaluator considered the three characteristics such as place of palatal, manner of liquid, and voiced sound. All three characteristics of 'run' were considered, and one point was assigned. However, if one characteristic was missing, the word 'run' received an evaluation of '0'. Therefore, in this process, each pronunciation or utterance was assigned either one or zero points.

By the three assessors' evaluations, each pronunciation received a total of three points or 100 percent. Based on the criterion of $\geq$ 66.67 PPC, each token's pronunciation was deemed accurate and awarded '1' point. This evaluation process was repeated three times for each utterance, resulting in a total of three points for an individual token.

For the seven treated sounds, each sound's scores added up to twelve points. Similarly, for the target word pairs, the cumulative score was twenty-four points for each individual pair (24 pts. x 7 treated sounds = 168 pts. or times of pronunciation). In total, the entire pronunciation instances for fifteen participants amounted to 2,520 times, which were analyzed for significant differences between the pretest and posttest using a t-test for dependent samples.

Findings

The findings are presented in accordance with the singular objective of the study, which sought to examine the statistically significant differences between the Mean scores of the Percent of Phoneme Correct (PPC) in both the pretest and posttest using the Minimal Contrast Approach (MCA) with parents who are native Thai speakers. The results are illustrated in the figures.
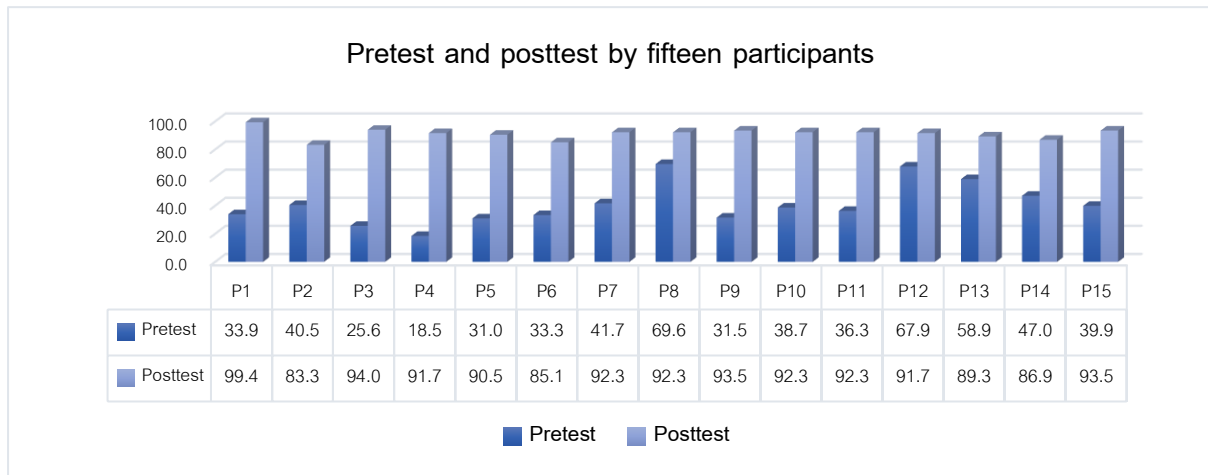

Pretest and posttest by fifteen participants

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
Pretest	33.9	40.5	25.6	18.5	31.0	33.3	41.7	69.6	31.5	38.7	36.3	67.9	58.9	47.0	39.9
Posttest	99.4	83.3	94.0	91.7	90.5	85.1	92.3	92.3	93.5	92.3	92.3	91.7	89.3	86.9	93.5

Figure 1 The PPC of pretest and posttest (Overall)

Figure 1 displays the overall Percent of Phoneme Correct (PPC), based on the pronunciation of 2,520 tokens recorded by fifteen participants. The posttest results are notably higher than the pretest results. The average PPC for the posttest is 91.2%, while the pretest PPC is 40.7%, indicating a disparity of 50.5%.
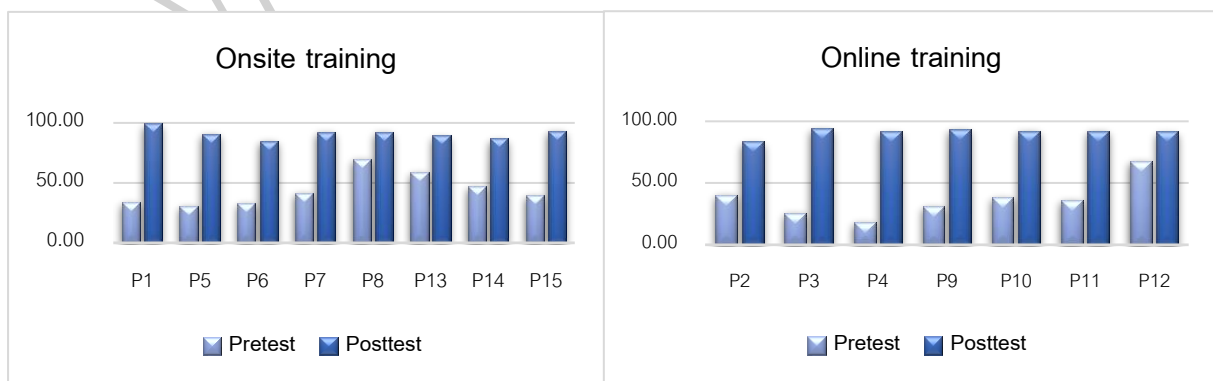
Figure 2 The PPCs' progress of the MCA scores between onsite and online training

Figure 2 illustrates the differences between two types of MCA training: onsite and online training with 8 and 7 participants, respectively. The average PPCs for onsite training between pretest and posttest are 44.42% and 91.15%, while for online training, they are 36.99% and 91.24%. Individually, the pretest and posttest results for onsite training participants are as follows: P1: 33.93% and 99.40%, P5: 30.95% and 90.48%, P6: 33.33% and 85.12%, P7: 41.67% and 92.26%, P8: 69.64% and 92.26%, P13: 58.93% and 89.29%, P14: 47.02% and 86.90%, P15: 39.88% and 93.45%, respectively. Both training methods display increases in vigor from pretest to posttest.

On the other hand, the online training results between pretest and posttest individually are as follows: P2: 40.48% and 83.33%, P3: 25.60% and 94.05%, P4: 18.45% and 91.45%, P9: 31.55% and 93.45%, P10: 38.69% and 92.26%, P11: 36.31% and 92.26%, and P12: 67.87% and 91.67%, respectively. The disparities between the pretest and posttest of onsite and online training are 46.73% and 54.25%, respectively.
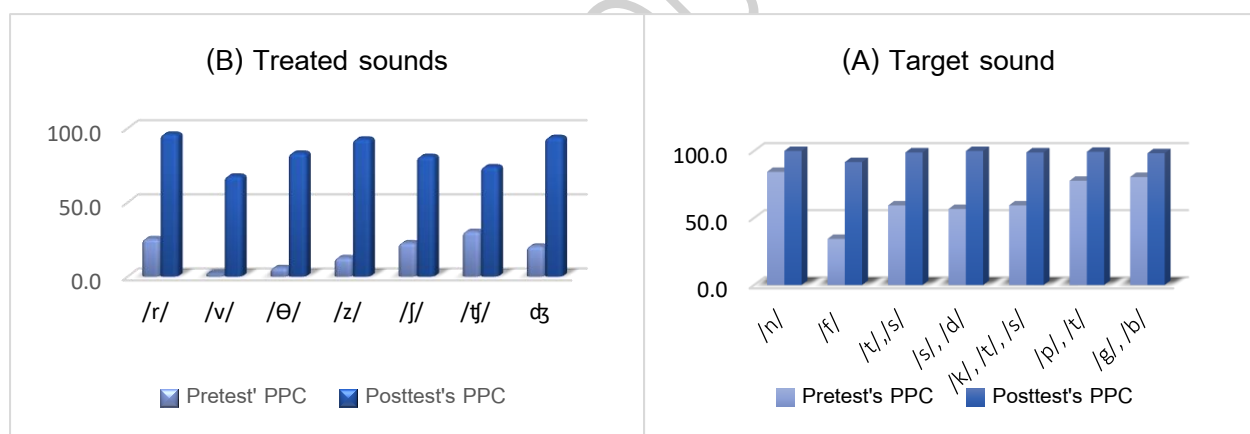
Figure 3 The PPCs' progress of the MCA scores between target sounds and treated sounds

Figure 3 displays the differences between two groups of sound classifications in MCA tokens. The 2,520 tokens were divided into two categories: the target sounds (1st words of a pair) with 1,260 tokens (A) and treated sounds (2nd words) with 1,260 tokens (B). As indicated in the figures (A and B), the posttest results for both groups are consistently higher than the pretests. For the target sounds, the posttest PPC is notably higher at 98.2 averagely compared to the pretest average of 64.7. The most significant disparities between the pretest and posttest, reflecting substantial progress among the participants, were observed in the following target

sounds: /n/, /f/, /t/ & /s/, /s/&/d/, /k/& /t/&/s, /p/&/t/, and /g/&/b/ (57.3%, 43.3%, 39.5%, 39.5%, 21.6, 17.7, and 15.6, respectively). Conversely, the treated sounds exhibit an average PPC of 82.5 in the posttest, a significant improvement from the pretest average of 17.2. The most significant disparities between the pretest and posttest were also observed in the following treated sounds: /z/, /ɵ/, /dʒ/, /r/, /v/, /ʃ/, and /tʃ/ (80.0%, 77.2%, 73.3%, 70.5%, 65.6, 58.3, and 43.6, respectively).

Table 5 The PPCs' pretest and posttest results across three sound positions

The initial sounds (34 tokens)				The medial sounds (2 tokens)				The final sounds (20 tokens)			
Target words		Treated words		Target words		Treated words		Target words		Treated words	
Pretest	Posttest	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
81.96	98.95	22.75	88.37	33.33	96.67	7.78	76.00	71.11	100.00	15.56	95.56

Table 5 presents additional results related to the position of sound contrasts (initial, final, and medial sounds), showing disparities of pretest and posttest of each 16.63% and 65.62%, 28.89% and 80.00%, and 63.34% and 68.22%. These findings suggest the effectiveness of the MCA; however, they do not indicate statistical significance due to the imbalance in the number of pairs and adherence to the inclusion criteria required for MCA tokens.

Table 6 Paired sample T-test result of the 2,520 MCA tokens produced by the fifteen participants

		Paired Samples Test							
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	pretest - posttest	-98.26667	30.61388	7.90447	-115.2201	-81.31327	-12.432	14	.000

Based on the results of the paired-samples test examining the correlation between the pretest and posttest scores of the 2,520 tokens pronounced by the fifteen participants, the significance value (.000) is less than .05, indicating a statistically significant difference. This

indicated that the 2,520 MCA tokens pronounced by Thai parents or adults, who were participants in the study, showed a distinct improvement in the posttest compared to the pretest.

Discussion

The objective of this quasi-experimental research, utilizing a one group pretest–posttest design, was to statistically analyze significant differences between pretest and posttest results through the application of the minimal contrast approach with 2,520 tokens pronounced on among the fifteen Thai participants who met the inclusion criteria at the moderate – highest levels of the HLE background and behaviors. The main findings of the study were notably positive, revealing significant improvement among participants in the production of both error and target sounds across all lessons. The results suggest that the Minimal Contrast Approach (MCA) holds promise as a beneficial method for enhancing oral English proficiency among parents in English as a Foreign Language (EFL) contexts. These outcomes align with previously mentioned findings students (Utkir qiziand & Sherali qizi, 2021; Ketkumbonk & Woragittanont, 2017; Kumprom, 2018; Altamimi, 2015), emphasizing that, despite being Thai native adults or parents, their English pronunciation skills exhibited substantial improvement comparable to the progress observed in young children and student groups among both the fields of education and Speech-Language Pathology (Combiths et al., 2019; Dodd et al., 2008; Bowen & Cupples, 2006).

Interestingly, the efficacy of the approach becomes apparent through the noticeable disparities between the pretest and posttest, indicating substantial progress among the participants in both the target and treated or error sounds, as depicted in the diagrams and tables. Even though there was a concerning issue regarding two different types of training: onsite and online, mainly due to parents' time allocation, there were no statistically significant differences. Regardless of the format, both trainings were designed with the parallel teaching procedures of the 2W3P teaching method (Warm up, Presentation, Practice, Production, and Wrap up) and employed the same learning materials and activities. Furthermore, participant selection was meticulously managed through direct and indirect control of variables. This included a survey using a five-point scale to gather background information and assess home literacy environment behaviors, focusing particularly on parents' self-efficacy and attitudes. A higher score indicated better outcomes. and (2) the implementation of sampling methods, encompassing convenient

sampling, voluntary sampling, and purposive sampling, to control extraneous factors that could potentially impact the outcomes.

According to the results, the observations will be further discussed in two different parts: the selection of sound contrasts, and intellectual differences between adults and children in the classroom situation. It is essential to consider the selection of sound contrasts developed for the target sounds. According to Gierut's generalization in 1992 and 2002, sound contrast selection is related to three dimensions: the number of distinctive contrasts, the nature of feature distinctions, and the relationship to the child's pretreatment grammar.

The first issue to discuss is the limited number of linguistic characteristics in the selection of sound contrasts using the conventional minimal pairs approach. This approach employs a limited number of distinctive linguistic features—typically one or two—within a pair. Additionally, the pairs are chosen for their similarity to facilitate English pronunciation skills. This results in improved production by making only a few changes within the same environment.

Maximal contrast, the intervention opposes to minimal contrast, is a phonemic difference that cuts across many featural dimensions and differentiated from other major class properties (Barlow & Gierut, 2002). Both minimal and maximal contrasts, whether limited or numerous, show similar progress, indicating greater improvement in different groups of participants but with different learning or therapy materials (Dodd et al., 2008). For instance, participants with mild or moderate phonological delay may exhibit greater improvement with minimal pairs than those with severe cases, and vice versa (Storkel, 2021). In this study, the participants, without any phonological delays or impairments, derived greater benefits from a limitation in the number of distinctive features and positive transfer of their mother tongue's phonemes through minimal contrast. For example, the contrast between /f/ and /v/ in the pair 'fine' – 'vine' differs a single feature (voiceless – voiced) which resulted in the disparities the average PPC for /f/ in the pretest and posttest is at 57.3%. Similar increase, the /v/ sound is at 65.5% This number limitation facilitated progress more effectively than maximal contrast, which involves several differences and affects those severe participants or children with fewer phonological experiences and multiple errors across various sound classes.

In essence, both minimal and maximal pairs facilitated participants differently. Participants learned and practiced phonemic differences through explicit contrasts between two

sounds in both words, while the similar features of L1 and L2 sound systems were positively transferred to the error sound which facilitated L2 learners' pronunciation learning.

Gierut's second dimension is the nature of feature distinctions (non-major and major class distinctions). In this study according to the formalized linguistic frameworks for English phonemes by Barlow and Gierut (2002), the obstruents vs sonorants (differing from their acoustic properties and airflow production) were primarily considered as a criterion of this sound contrast selection. Minimal contrast does not cut across the major class distinctions, but maximal pair does. The error sounds of /v/, /ɵ/, /z/, /ʃ/, /ʧ/, and /ʤ/are in the obstruents while /r/ sound is in the sonorant. When the participants pronounced the target sounds in obstruents occurring a turbulent airflow and major constrictions in the vocal tract. This turbulent airflow is also transferred to the error sounds. For example, the contrast pair between /n/ and /r/ in the pair 'night' – 'right' belongs to sonorant. The participants produced continuous and non-turbulent airflow among the pair.

The final dimension, the criteria for the selection primarily considered the pretreatment experiences of the participants. That is; the treated phoneme is unknown phoneme and paired with another known phoneme from the parents' knowledge. With the similarity of linguistic characteristics between the English and Thai sound system, such as /p/, /b/, /s/, /n/, /t/, /d/, /k/, /g/, and /f/, aiming to facilitate effective learning and practice for Thai native parents. Conversely, sounds that do not exist in the Thai sound system resulted in error productions. This aligns with the concept of positive transfer in language learning. When L2 learners have experiences with sounds existing in their native language, they encounter less difficulty in practicing their L2 skills (Altamimi, 2015). Besides the effective MCA, the positive transfer strategy by Helfenstein (2005) dealing with L2 learning, many L2 leaners adopted this strategy when the certain sounds matched in their L1. This explains why the disparities between the pretest and posttest of the target sounds showed less difference when compared to those treated sounds. However, based on the negative transfer by Helfenstein, it is worth noting that the potential cause of errors may arise from negative transfer of Thai sounds, a phenomenon commonly observed among individuals learning L2 or other languages.

Besides the sound contrast selection, a few possible reasons of the intervention effectiveness are observed from the intellectual differences in learning by using inductive and explicative methods between adults and children in the classroom situation (Steinberg & Sciarini, 2006). The participants as adult learners of a second language (L2) can demonstrate exceptional

proficiency in classroom settings compared to young children because the MCA lessons not only involve practice but also provide explanations of linguistic feature differences and the MCA increases the speaker's sensitivity and awareness between two contrasting sounds with the time limitation in classroom setting. These results aligned to several minimal pair studies in older students to adults. For example, the studies by Altamimi, 2015 found that a second language learner awareness of contrasting sounds through rule's explanations can greatly help the speakers improve their oral communication.

In addition, a pedagogical perspective based on the notions of social situations influencing second-language learning, as proposed by Steinberg and Sciarini (2006). The two situations— natural and classroom situations —that an individual experiences can significantly impact the learning of a second language. Natural and classroom situations affect the language proficiency of children, adults, or parents differently.

Conclusion

The results of this current study affirm the effectiveness of implementing the minimal contrast approach, with the emphasis on target sound selection. The findings suggest that within a specific group of parents or adult English learners who can explicitly learn through rules and practices, their ultimate performance and intentions were reflected in their proficiency throughout the MCA training.

Furthermore, the significance of this study lies in its expansion of the scope of minimal pairs, traditionally considered for children or student groups, to also include adults, especially parents. This is particularly relevant to a group of parents who aspire to teach and support their children at home despite lacking sufficient English literacy skills.

Limitation of the Study

One limitation of this study is the selection process of sound contrasts. The sound contrasts of the picture words or concrete words were specifically chosen with consideration for young children in subsequent research studies. Factors such as their ages, abilities, readiness, intelligence, and Thai oral and communicative skills were taken into account. Consequently, the number of MCA tokens was limited in the selection process, resulting in inconsistency in the sound position numbers of the tokens.

Another limitation lies in the participants, which was susceptible to interference from uncontrolled factors such as unexpected job tasks, other businesses, or the illness of their children, for example. To address this challenge, well prepared substitution trainings, both onsite and online trainings, should be readily available to fulfill their needs.

Recommendations of the Study

1. The Implications of the Study

Based on the study's findings, the English error sounds /r/, /v/, /θ/, /z/, /ʃ/, /tʃ/, and /dʒ/ commonly made by Thai native speakers learning English showed significant improvement after the MCA intervention, wherein the selection of target sounds in two-word pairs played a crucial role. Through paired practice, participants enhanced their sensitivity to sound contrasts, effectively distinguishing between two sounds. Consequently, this finding can directly benefit parents seeking to improve their English pronunciation skills, particularly in the HELE setting.

Furthermore, related organizations dealing directly with parents and caregivers can develop alternative education curricula or training programs for parents' English skills in urban and local communities, as well as in schools, to encourage parental involvement in Thai communities. This can enhance parental knowledge, which directly influences children's English language development.

2. The Recommendations for further Study

Due to limitations in the process of word pair selection, most sounds were positioned in the initial rather than the final or medial positions. This suggests that further studies could benefit from focusing on specific positions to thoroughly assess the approach's effectiveness and understand its potential more comprehensively. Furthermore, investigating the correlation between parents' attitudes, self-efficacy in English learning, and other related factors, in conjunction with the MCA intervention, would provide valuable insights for future studies.

Acknowledgement

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