

**Interaction of Markedness and Transfer of /r/
in L1 Thai Learners Acquiring L1 Thai and L2 English**

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ABSTRACT

In Thai, prevocalic /r/ shows a range of possible variants. The two standard variants are the prestigious trill [r] and the flap [ɾ], but some speakers may also use the lateral [l], or, in an initial cluster, /r/-cluster deletion [Ø]. In this dissertation, I argue that the phonological modification of rhotics in favour of lateral [l] and deletion [Ø] can be explained by considering the preference for the unmarkedness. Features or structures are distinguished as marked or unmarked features. The lateral [l] and deleted [Ø] variants are considered relatively unmarked features in comparison with rhotics.

The primary aim of the dissertation is to investigate which variable strategies Thai speakers employ when speaking English, alongside their native language. The rhotics in these two languages differ and, in terms of markedness, the English approximant [ɹ] is comparatively more marked than the rhotics in Thai. This study is an overview of L2 phonology in Thai liquids, and this is supplemented by a variationist analysis. It examines the speech production of prevocalic English /r/ by L2 Thai learners of English from the perspectives of markedness and transfer. It investigates if the Markedness Differential Hypothesis (MDH) proposed by Eckman (1977) is able to explain the errors subjects make in learning L2 English.

In the variationist analysis, the quantitative paradigm was adopted to specify which linguistic and extralinguistic factors were of statistical significance in relation to the merger of /r/ and /l/ in L1 Thai and L2 English. Speech data were subjected to mixed logistic regression analysis with syllable stress, preceding segment, age, gender, speech style, and proficiency as based on IELTS speaking score as independent variables along with speakers and words as random effects. Data were collected from ten native speakers of Thai.

The results show that the MDH could predict difficulties in L2 acquisition and which features were more likely to be transferred to L2 English, the results in terms of the relationship between the degrees of difficulty and degrees of markedness did not support the MDH.

In the variationist analysis, the best-fit model shows that preceding segment, age group, and speech style influence the choice of variants in terms of the merger of /r/ and /l/ in both the L1 and L2. Gender is a significant factor in L1 Thai but is found to be insignificant in L2 English. With /r/-/l/ merger in Thai, the declining use of the standard Thai flap [ɾ] and trill [r] in formal speech in the present study seems to follow the trend indicated in previous studies,

but the decline of /r-/l/ merger in informal context is unexpected, given that the existing literature suggests that the frequency of /r-/l/ merger in Thai is increasing.

DECLARATION

I declare that this thesis is my own work. I have correctly acknowledged the work of others and no part of the material offered has been previously submitted by me for any other award or qualification in this or other university.

Name: _____

Date: _____

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LIST OF ABBREVIATIONS

- NL: Native language
- TL: Target language
- L1: First language
- L2: Second language
- SLA: Second language acquisition
- IL: Interlanguage
- CAH: Contrastive Analysis Hypothesis
- MDH: Markedness Differential Hypothesis
- UG: Universal Grammar

TABLE OF CONTENTS

ABSTRACT	i
DECLARATION	i
ACKNOWLEDGEMENTS	iii
LIST OF ABBREVIATIONS	v
LIST OF FIGURES	x
LIST OF TABLES	xiii
Chapter 1. Introduction	1
1.1 Introduction	1
1.2 Rationale of the study	1
1.3 Contribution of the study	3
1.4 Aims of the study	4
1.5 The organisation of the study	5
Chapter 2. L1 Phonology	6
2.1 Introduction	6
2.2 Liquids in Thai and English	6
2.2.1 Liquids in Thai	7
2.2.2 Liquids in English	10
2.3 Phonotactics in Thai and English	12
2.3.1 Tone in Thai.....	12
2.3.2 Word-initial consonant clusters in Thai.....	13
2.3.4 Word-initial consonant clusters in English.....	14
2.4 Influence of linguistic factors on L1 phonology	15
2.4.1 Syllable stress	16
2.4.2 Preceding segments	16
2.5 Influence of extralinguistic factors on L1 acquisition	17
2.5.1 Speech style and socioeconomic status.....	17
2.5.2 Area, home language, sex, and speech style	17
2.6 Production of liquids in L1 Thai by native speakers of Thai	18

2.7 Summary	21
Chapter 3. L2 Phonology	22
3.1 Introduction.....	22
3.2 Theoretical framework for the acquisition of L2 phonetics and phonology	22
3.2.1 Phonological transfer and the Contrastive Analysis Hypothesis (CAH)	23
3.2.2 Universals of phonology and markedness	24
3.2.3 Markedness of /r/ and /l/ in both L1 and L2 acquisition.....	29
3.2.3.1 <i>Child language acquisition</i>	29
3.2.3.2 <i>Articulation</i>	29
3.2.3.3 <i>Neutralisation</i>	30
3.2.3.4 <i>Statistical frequencies and implicational relationship</i>	30
3.3 Theoretical principles of the quantitative paradigm.....	32
3.4 Influence of markedness and transfer on L2 phonology acquisition	33
3.5 Influence of speech style on L2 acquisition.....	36
3.6 Production of liquids in L2 English by native speakers of Thai	37
3.7 Research questions.....	39
3.8 Summary	41
Chapter 4. Methodology	43
4.1 Introduction.....	43
4.2 Methodology	43
4.2.1 Participants	43
4.2.2 Stimuli	45
4.2.3 Procedure.....	48
4.3 Data Analysis	49
4.3.1 Transcription.....	49
4.3.2 Quantitative analysis.....	50
4.3.3 Statistical analysis.....	52
4.4 Summary	53
Chapter 5. Results and Interpretation	54
Quantitative Analysis of Variation: Thai	54
5.1 Introduction.....	54
5.2 Overall distribution of the prevocalic /r/ by speakers.....	54

5.3 Statistical analysis.....	57
5.4 Interacting factors of age group, gender, and speech style.....	60
5.5 Sources of variation	62
5.5.1 Syllable stress	62
5.5.2 Preceding sound.....	65
5.5.3 Age	68
5.5.4 Gender	72
5.5.5 Speech style	75
5.5.6 IELTS Speaking Score	79
5.6 Summary	83
Chapter 6. Results and Interpretation.....	84
Quantitative Analysis of Variation: English.....	84
6.1 Introduction	84
6.2 Overall distribution of the prevocalic /r/ by speakers	85
6.3 Acoustic spectrographic analysis.....	89
6.4 Overall distribution of the prevocalic /r/ by languages	92
6.5 Interaction of markedness and transfer	97
6.6 Implicational markedness.....	100
6.7 Statistical analysis.....	103
6.8 Interacting factors of age group and speech style.....	104
6.9 Sources of variation	106
6.9.1 Syllable stress	106
6.9.2 Preceding sound.....	110
6.9.3 Age	113
6.9.4 Gender	118
6.9.5 Speech style	121
6.9.6 IELTS speaking score	127
6.10 Summary	130
Chapter 7. Discussion and Conclusion.....	132
7.1 Introduction	132

7.2 Discussion	132
7.2.1 Overall distribution of prevocalic /r/ in L1 and L2	132
7.2.2 Interaction of markedness and transfer.....	133
7.2.3 Linguistic and extralinguistic factors as sources of variation	136
7.2.4 Implications of the merger of /r/ and /l/ in Thai.....	142
7.3 Conclusions	147
7.4 Limitations and suggestions for future research	150
APPENDIX A: Stimuli in L1 Thai	151
1. Picture naming	151
2. Passage reading.....	155
3. Word-list reading.....	157
4. Minimal pair reading.....	158
APPENDIX B: Stimuli in L2 English	159
1. Picture naming	159
2. Passage reading.....	163
3. Word-list reading.....	164
4. Minimal pair reading.....	165
APPENDIX C: Questionnaire	166
APPENDIX D: Consent form	167
REFERENCES	168

LIST OF FIGURES

FIGURE 2.1: LIQUIDS IN THAI ACCORDING TO STYLISTIC FACTORS.....	8
FIGURE 2.2: LIQUIDS IN ENGLISH	11
FIGURE 5.1: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO SPEAKER....	56
FIGURE 5.2: THAI PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO AGE GROUP, GENDER, AND SPEECH STYLE.....	61
FIGURE 5.3: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO SYLLABLE STRESS.....	64
FIGURE 5.4: THAI PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO SYLLABLE STRESS.....	65
FIGURE 5.5: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO PRECEDING SOUND	67
FIGURE 5.6: THAI PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO PRECEDING SOUND	68
FIGURE 5.7: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO AGE GROUP	70
FIGURE 5.8: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO AGE.....	71
FIGURE 5.9: THAI PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO AGE GROUP	72
FIGURE 5.10: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO GENDER....	74
FIGURE 5.11: THAI PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO GENDER.....	75
FIGURE 5.12: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO SPEECH STYLE.....	78
FIGURE 5.13: THAI PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO SPEECH STYLE.....	79
FIGURE 5.14: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO IELTS SPEAKING SCORE	82
FIGURE 5.15: THAI PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO IELTS SPEAKING SCORE	83
FIGURE 6.1: DISTRIBUTION OF ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO SPEAKER	87
FIGURE 6.2: DISTRIBUTION OF THAI AND ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO SPEAKER	89
FIGURE 6.3: SPECTROGRAMS OF THE WORDS ‘LAY’ AND ‘RAY’, PRODUCED AS [LEi] AND [REi] BY SPEAKER M DURING THE ENGLISH SESSION.	89
FIGURE 6.4: SPECTROGRAM OF THE WORD /RŪ:AN/ ‘HOUSE’ PRODUCED AS [rŪ:AN] BY SPEAKER PA DURING THE THAI SESSION.....	90
FIGURE 6.5: SPECTROGRAM OF THE WORD /RĀ:/ AND /LĀ:/ BOTH PRODUCED AS [LĀ:] BY SPEAKER F DURING THE THAI SESSION.....	90
FIGURE 6.6: SPECTROGRAM OF THE WORDS ‘LAY’ AND ‘RAY’ BOTH PRODUCED AS [LEi] BY SPEAKER F DURING THE ENGLISH SESSION.	91
FIGURE 6.7: SPECTROGRAM OF THE WORD ‘ROAD’ PRODUCED AS [rƏʊD] BY SPEAKER M DURING THE ENGLISH SESSION.	92

FIGURE 6.8: DISTRIBUTION OF PREVOCALIC /R/ VARIANTS ACCORDING TO LANGUAGE.....	96
FIGURE 6.9: DISTRIBUTION OF MARKED AND UNMARKED PREVOCALIC /R/ VARIANTS ACCORDING TO LANGUAGE	100
FIGURE 6.10: DISTRIBUTION OF THAI AND ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO PHONOLOGICAL CONTEXT	102
FIGURE 6.11: THAI AND ENGLISH PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO PHONOLOGICAL CONTEXT.....	103
FIGURE 6.12: ENGLISH PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO AGE GROUP AND SPEECH STYLE	106
FIGURE 6.13: DISTRIBUTION OF ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO ENGLISH SYLLABLE STRESS	108
FIGURE 6.14: DISTRIBUTION OF THAI AND ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO SYLLABLE STRESS.....	109
FIGURE 6.15: ENGLISH PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO SYLLABLE STRESS	110
FIGURE 6.16: DISTRIBUTION OF THAI AND ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO PRECEDING SOUND	112
FIGURE 6.17: ENGLISH PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO PRECEDING SOUND	113
FIGURE 6.18: DISTRIBUTION OF ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO AGE...	115
FIGURE 6.19: DISTRIBUTION OF THAI AND ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO AGE GROUP.....	116
FIGURE 6.20: ENGLISH PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO AGE GROUP	117
FIGURE 6.21: YEARS LEARNING ENGLISH WITH NATIVE SPEAKERS OF ENGLISH ACCORDING TO AGE GROUP.....	118
FIGURE 6.22: DISTRIBUTION OF THAI AND ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO GENDER.....	120
FIGURE 6.23: ENGLISH PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO GENDER	121
FIGURE 6.24: DISTRIBUTION OF THAI AND ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO SPEECH STYLE.....	124
FIGURE 6.25: ENGLISH PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO SPEECH STYLE	125
FIGURE 6.26: ENGLISH PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO SPEECH STYLE	126
FIGURE 6.27: ENGLISH PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO ORDER OF TASKS	127
FIGURE 6.28: DISTRIBUTION OF THAI AND ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO IELTS SPEAKING SCORE.....	129
FIGURE 6.29: ENGLISH PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ ACCORDING TO IELTS SPEAKING SCORE	130

FIGURE 7.1: PREVOCALIC /R/: THE MERGER OF /R/ AND /L/ IN THAI AND ENGLISH ACCORDING TO SPEAKER..... 143

LIST OF TABLES

TABLE 2.1: FIVE CONTRASTING TONES IN THAI.....	13
TABLE 2.2: PERMISSIBLE INITIAL CLUSTER IN THAI.....	14
TABLE 2.3: PERMISSIBLE INITIAL CLUSTER IN ENGLISH	15
TABLE 4.1: PARTICIPANTS ACCORDING TO GENDER, AGE, AND IELTS SPEAKING SCORE.....	45
TABLE 4.2: INDEPENDENT VARIABLES ACCORDING TO FACTOR AND FACTOR GROUP	46
TABLE 4.3: BOUNDARIES OF THE PREVOCALIC /R/ VARIANTS ACCORDING TO RESEARCH QUESTIONS	52
TABLE 5.1: THE BEST MODEL INCLUDING NUMBER OF TOKENS (N). POSITIVE NUMBERS REFLECT MORE MERGER, NEGATIVE NUMBERS REFLECT MORE DISTINCTION. RANDOM EFFECTS OF WORD (SD = 0.7381) AND SPEAKER (SD = 2.2574). AIC = 954.4	60
TABLE 5.2: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO SYLLABLE STRESS	63
TABLE 5.3: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO PRECEDING SOUND	66
TABLE 5.4: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO AGE GROUP..	69
TABLE 5.5: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO GENDER	73
TABLE 5.6: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO SPEECH STYLE	77
TABLE 5.7: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO IELTS SPEAKING SCORE	81
TABLE 6.1: DISTRIBUTION OF THE PREVOCALIC /R/ VARIANTS ACCORDING TO LANGUAGE....	93
TABLE 6.2: DISTRIBUTION OF MARKED AND UNMARKED PREVOCALIC /R/ VARIANTS ACCORDING TO LANGUAGE	98
TABLE 6.3: DISTRIBUTION OF ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO PHONOLOGICAL CONTEXT.....	101
TABLE 6.4: THE BEST MODEL INCLUDING NUMBER OF TOKENS (N). POSITIVE NUMBERS REFLECT MORE MERGER, NEGATIVE NUMBERS REFLECT MORE DISTINCTION. RANDOM EFFECTS OF WORD (SD = 0.9902) AND SPEAKER (SD = 1.5917). AIC = 1176.7	104
TABLE 6.5: DISTRIBUTION OF ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO SYLLABLE STRESS	107
TABLE 6.6: DISTRIBUTION OF ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO PRECEDING SOUND	111
TABLE 6.7: DISTRIBUTION OF ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO AGE GROUP	114
TABLE 6.8: DISTRIBUTION OF ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO GENDER	119
TABLE 6.9: DISTRIBUTION OF ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO SPEECH STYLE	122
TABLE 6.10: DISTRIBUTION OF ENGLISH PREVOCALIC /R/ VARIANTS ACCORDING TO IELTS SPEAKING SCORE	128

TABLE 7.1: SUMMARY OF RESULTS ACCORDING TO THE PREDICTION OF THE MARKEDNESS DIFFERENTIAL HYPOTHESIS (MDH)	136
TABLE 7.2: SUMMARY OF RESULTS ON THE MERGER OF /R/ AND /L/ ACCORDING TO FACTORS	141
TABLE 7.3: DISTRIBUTION OF THAI PREVOCALIC /R/ VARIANTS ACCORDING TO SPEECH STYLE	144
TABLE 7.4: THAI MERGER OF /R/ AND /L/: COMPARISON OF /R/ PRODUCTION ACCORDING TO SPEECH STYLE	145

Chapter 1. Introduction

1.1 Introduction

This chapter explains the rationale, contribution, aims of the study, and the organisation of this thesis.

1.2 Rationale of the study

The present study is mainly about the theoretical phonological and L2 aspects of Thai. It aims to investigate the speech production of prevocalic /r/ by L2 Thai learners of English. It describes how rhotics and lateral interact with each other phonetically and phonologically within Thai, the national language of Thailand. Thai has a prevocalic contrast in its liquids, which are disallowed from occurring postvocally. To put it simply, the contrast between rhotics and lateral appears only in the initial and initial cluster positions in Thai. There is a wider range of possible phonetic realisations of /r/ than /l/ in Thai as it has rhotics with two manners of articulation which are either flapped or trilled. Phonologically, neither of these rhotics appear contrastively, as in [r̄ā:] or [r̄ā:] ‘fungus’. That is to say, a single phoneme /r/ can be realised in two phonetically different forms in the same environment: a flap [ɾ] and a trill [r]. Although both flap [ɾ] and trill [r] are standard rhotics in Thai according to Tingsabath and Abramson (1993) and Harris (1996), it is commonly found that the flap [ɾ] and the trill [r] convey different stylistic meanings. The trill [r] is emblematic of a very formal register, whereas the flap [ɾ] is in ordinary use by Thai speakers. While the two sounds of /r/ are associated with sound variants, the lateral [l] does not show variation, comprising a single allophone [l]. An initial /l/ is thus not stylistically conditioned (Treyakul 1986; Chunsuvimol 1996), while /r/ rests on phonologically free yet stylistically contrastive variation.

There exists a meaningful phonemic distinction between /r/ and /l/, which is sometimes merged and pronounced as [l] in informal or fast speech leading to a loss of distinction between the two separate phonemes of /r/ and /l/. For instance, [l̄ā:] ‘donkey’ and [r̄ā:]/[r̄ā:] ‘fungus’ are distinct in formal context or higher register but tend to be merged and pronounced homophonously as [l̄ā:] referring to either ‘donkey’ or ‘fungus’ in informal or casual speech. Thus, a lateral [l] becomes an allophone of a rhotic phoneme because the contrast between rhotics and lateral is not preserved. Thai speakers therefore recognise the trill [r] as a prestigious standard feature and use it in very formal contexts, and the flap [ɾ] as a standard /r/ used in normal contexts, while the realisation of /r/ as [l], which is the same to the realisation of the lateral phoneme, in the lower register is regarded as non-standard variant. However, the rhotic and lateral sounds are still two separate phonemes and thus are

represented orthographically by two separate forms; that is, ‘ร’ for /r/ and ‘ล’ for /l/ in Thai.

It is also commonly found that, in complex onsets, /r/ as a consonant cluster is substituted with /l/, as in /klɔ̃ːŋ/ for /krɔ̃ːŋ/ ‘to filter’. In addition, both /r/ and /l/ as second members of an initial cluster, which are preserved in the higher register, are likely to disappear altogether in colloquial speech or lower register, as in [kɔ̃ːŋ] for either /krɔ̃ːŋ/ ‘to filter’ or /klɔ̃ːŋ/ ‘drum’. It is thus the case in Thai that the phonological process of /r/-/l/ merger takes place when the initial /r/ is lateralised or both the /r/ and /l/ as cluster members are deleted altogether (Phootirat 2012: 132). Following Phootirat (2012), the term ‘merger’ will thus be used throughout the present study to represent the phonological process of substitution with /l/ and /r/-cluster deletion for prevocalic /r/.

The term ‘substitution’ is not adopted in the present study due to the fact that, in order to answer the research question 2), the variable should be grouped into two categories as a binary variant. In this respect, the realisation of the rhotics is considered as ‘/r/-/l/ distinction’, while ‘/r/-/l/ merger’ involves not only /l/ substitution but also /r/-cluster deletion. Then, the binary variant of either ‘/r/-/l/ distinction’ or ‘/r/-/l/ merger’ can be analysed using mixed logistic regression analysis. It has generally been found in previous study that merger in Thai is stylistically constrained; however, phonetically, /r/-/l/ merger for some speakers is regarded as free variation because stylistic or contextual factors do not influence the choice of variant. In addition to these two phonological processes of ‘/r/-/l/ merger’, it is also the case that native speakers of Thai sometimes replace /l/ with /r/, which is regarded as hypercorrection. The replacement of /l/ with /r/ is, however, not as frequent as /l/ substitution for /r/ prevocalically in Thai. In terms of written forms in Thai, it is likewise evidenced that Thai speakers sometimes use [l] for /r/ in writing, as in [lɔ̃ːŋ.hâj] for /rɔ̃ːŋ.hâj/ ‘to cry’.

It is often the case that native speakers of Thai might not always be consistent in the pronunciation of the prevocalic /r/ variants, and so variation in speech production is not categorical. In markedness perspective, the modification of /r/-/l/ merger possibly advances through the preference for unmarkedness. In this respect, learners acquire unmarked features or structures before relatively more marked features or structures both in the first language (L1) (Jakobson 1941) and the second language (L2) (Eckamn 1977). According to the relative degree of markedness, the lateral [l] and deleted [Ø] variants are considered comparatively unmarked in comparison with the rhotics. For this reason, the preference for the unmarked features might then apply to L2 acquisition due to the transfer from L1 to L2. The markedness in terms of /r/ and /l/ is clarified in Section 3.2.3 of Chapter 3.

1.3 Contribution of the study

The present study is intended to contribute to broader knowledge and deeper understanding of the process of second language acquisition (SLA), especially in the prevocalic /r/ production of L2 Thai learners of English, by exploring the interaction of markedness and L1 transfer. It is primarily an overview of L2 phonology in Thai liquids. Although many previous studies examined how native speakers of Thai pronounce the prevocalic /r/ in both L1 Thai and L2 English, there were no studies which explored the speech production of /r/ from the basis of markedness perspective. In this sense, prevocalic /r/ in both languages is different and the English approximant is more marked than features used in L1 Thai. For this reason, in addition to the differences of the rhotics in L1 and L2, the markedness perspective can help to make clear how native speakers of Thai acquire more marked /r/ in L2 English. Markedness might help to explain which variants, marked or unmarked, are more likely to be produced in L2. In the present study, its primary aim is to investigate how speakers acquire the segment in question in the L2 and which linguistic variants tend to be transferred to L2 English more frequently. It thus investigates if the Markedness Differential Hypothesis (MDH) proposed by Eckman (1977) is able to predict and explain the errors subjects make in learning L2 English and to predict which features are more likely to be transferred to the L2. The MDH is employed in the present study because this theory combines both transfer from the L1 and markedness universals as complementary approaches in the learning process. The two factors of transfer and markedness are complementary; however, they give different predictions about which variant is more likely to be realised in L2 oral production in the present study, as summarised in Section 4.3.2.

With the second contribution, although variationist analysis is the secondary aim of the present study, the relationship between factors and pronunciation is also examined. In addition to the extralinguistic factors which have been investigated in the existing literature, the present study explores how linguistic predictors of syllable stress and preceding sound affect the speech production of the prevocalic /r/ in both L1 Thai and L2 English.

Although the main aim of the present study is not sociolinguistic, a variationist approach is used to identify trends in the light of the merger of /r/ and /l/. With regard to the third contribution of the present study, the findings in the usage of /r/ variants in L1 Thai might suggest the potential direction of language change in the future.

1.4 Aims of the study

The prevocalic /r/ is chosen in the present study because of the different features of speech sound in Thai ranging from prestigious alveolar trills to standard flaps, non-standard laterals, or, in initial cluster, non-standard /r/-cluster deletion. These variants are usually constrained by speech registers. According to Yodmongkhon (2000: 1-2), the replacement of /r/ with /l/ or /r/-cluster deletion was regarded as improper pronunciation. For this reason, on several occasions since 1952, the government and educational section encouraged Thai speakers to use the standard form of the prevocalic /r/, which were the flap [ɾ] and the trill [r]. In addition, a module was provided for Thai secondary-school students in 1994 which intended to encourage correct pronunciation in terms of the prevocalic /r/ and /l/ in both initial and initial cluster. Taking these observations into account, the present study is an overview of L2 phonology in Thai liquids. It thus has three main goals.

The present study examines the difficulties of L2 Thai learners of English in learning the prevocalic /r/. The first aim is to demonstrate whether the Markedness Differential Hypothesis (MDH) is valid in being able to predict the L2 learners' difficulties in learning L2. The prediction is based on differences of the features in L1 and L2 together with relative degree of markedness. It should be noted that the standard rhotics in L1 Thai and L2 English differ. That is, the prestigious standard trill [r] and standard flap [ɾ] are standard rhotics in L1 Thai, whereas L2 English has the approximant [ɹ] as the standard rhotic. The present study also explores if patterns of acquisition and the difficulties correspond to the markedness relations between L1 and L2.

The second aim is to explore how markedness and transfer effects interact in the English production of the prevocalic /r/. The present study aims to address which features of L1 Thai are more frequently used when learning the prevocalic /r/ in L2 English. On the other hand, it might be the case that L2 Thai learners of English successfully learn the prevocalic /r/ in L2 English by not transferring the features used in L1 Thai to L2 English.

In relation to the third research aim, the present study provides additional role of linguistic factors of syllable stress and preceding segment in the merger of /r/ and /l/. The prevocalic /r/ in Thai is counted as a token of a variable that varies on the dimensions of either /r/-/l/ distinction or /r/-/l/ merger. In addition to the extralinguistic constraints investigated in the previous studies (Beebe 1974; Beebe 1980; Treyakul 1986; Chunsuvimol 1993; Pulsup 1993; Phootirat 2012; Panyaatisin 2013; Pookkawes 2014), the present study examines the effect of linguistic (syllable stress and preceding sound) and extralinguistic (age group,

gender, speech style, and IELTS speaking score) factors that govern the acquisition of /r/-/l/ merger in both L1 Thai and L2 English.

1.5 The organisation of the study

The present thesis contains seven chapters. Chapter 2, which follows this Introduction chapter, describes L1 phonology. It gives an inventory of the liquids and shows phonotactics in both L1 Thai and L2 English. A brief explanation of existing research in L1 acquisition relevant to the present study is also provided in Chapter 2. Chapter 3 primarily deals with the L2 phonology. The phonological and theoretical background is also explained. It presents a theoretical framework of L2 acquisition and the quantitative paradigm. In Chapter 3, the existing literature relating to L2 phonology acquisition is provided. Chapter 4 describes the research methodology. The results and interpretation of speech production in L1 Thai and L2 English are illustrated separately in Chapters 5 and 6 respectively. The final chapter, Chapter 7, presents a discussion of the findings, describes the conclusions and limitations of the study, and offers suggestions for future research.

Chapter 2. L1 Phonology

2.1 Introduction

This chapter focuses attention on L1 phonology. It describes the general phonetic and phonological characteristics of rhotics and laterals, along with the nature of their relationship in L1 Thai and L2 English. Liquids in Thai and English are presented in Section 2.2, and the phonotactics in Thai and English in Section 2.3. The influence of linguistic and extralinguistic factors on L1 phonology acquisition is given respectively in Section 2.4 and Section 2.5. Section 2.6 explains the L1 production of liquids by native speakers of Thai. A summary of the chapter is in section 2.7.

2.2 Liquids in Thai and English

Rhotics and laterals together form the class of liquids. These two types of sound are grouped together because of the phonetic and phonological properties rhotics and laterals have in common. Phonetically, liquids are often generally defined as being within the most sonorous group of oral consonants and are termed ‘non-nasal sonorant consonants’ (Ladefoged and Maddieson 1996: 182). Davenport and Hannahs (2010: 31) posit that ‘what liquids have in common is that they are produced with unhindered airflow (which distinguishes them from obstruents) but nonetheless involve some kind of obstruction in the oral tract (unlike glides and vowels, which are articulated with open approximation).’ Moreover, rhotics and laterals share in common the lateral flap [ɺ], which auditorily resembles both the flap [ɾ] and lateral [l] resulting in patterns of alternation between [ɾ] and [l] in several languages (Ladefoged and Maddieson 1996: 243). In addition, the vast majority of languages have both liquid phonemes rather than a single liquid in their inventories. The grouping of rhotics and laterals might then suggest a relationship between the two in languages whose inventories allow both phonemes. Phonotactically, both rhotics and laterals have freedom to occur as the second member of a consonant cluster (Ladefoged and Maddieson 1996: 182). In Thai, both liquids fall into a single class following this phonological perspective. That is, firstly, both /r/ and /l/ are the second members of a syllable-initial cluster; and, secondly, the rhotics and the lateral can alternate with each other prevocally in the sound inventory of Thai. Both Thai and English allow these two liquids - /r/ and /l/ - in their phonemic inventory, as described first for Thai in Section 2.2.1 and then for English in Section 2.2.2.

2.2.1 Liquids in Thai

In Thai, /r/ and /l/ are limited to the prevocalic position. Thai has one lateral along with a rhotic which has two register-dependent phones. Tingsabadh and Abramson (1993) and Harris (1996) observe that a voiced apico-alveolar flap [ɾ], a voiced apico-alveolar trill [r̄], and a voiced apico-alveolar lateral approximant [l] are typical productions of Thai liquids by native speakers, as shown below in examples 1a) and 1b).

- (1) a. [ɾā:] / [r̄ā:] ‘fungus’ [k^hɾā:] / [k^hr̄ā:] ‘time’
b. [lā:] ‘donkey’ [k^hlā:] ‘to move, to walk’

Although both the flap [ɾ] and trill [r̄] shown in 1a) exist in Thai (Tingsabadh and Abramson 1993; Harris 1996), the trill [r̄] is only used in very formal situations and emphatic speech, especially in news broadcasting, academia, and formal public speeches (Beebe 1974; Treyakul 1986; Harris 1996). The flap [ɾ] is in ordinary use by speakers of Thai. It is produced in a lower speech register and does not involve the conscious attention which seems to be required when Thais produce the trill [r̄]. In Thai, the flap [ɾ] and trill [r̄] are regarded as standard rhotics.

As to the flap and tap, linguists such as Ladefoged and Maddieson (1996: 231) have proposed a distinction between these two sounds:

...a flap is a sound in which a brief contact between the articulators is made by moving the active articulator tangentially to the site of the contact, so that it strikes the upper surface of the vocal tract in passing; a tap is a sound in which a brief contact between the articulators is made by moving the active articulator directly towards the roof of the mouth.

However, the present study will follow Lindau (1985), who did not distinguish between the flap and tap. The term ‘flap’ [ɾ] will be used in the present study to represent both processes of the flap and tap. In addition, the term ‘flap’ was used by Beebe (1974), Treyakul (1986), Chunsuvimol (1993), Phootirat (2012), and Pookkawes (2014) whose studies focused on phonological variations in liquids in Thai and found that there exists a sound variation of the liquids in Thai.

It also appears that a shift towards the merger of /r/ and /l/ has been occurring and is still present in the speech of present day speakers in Thai, particularly in informal speech contexts (Harris 1972; Beebe 1974; Treyakul 1986; Chunsuvimol 1993; Pulsup 1993; Phootirat 2012; Panyaatisin 2013; Pookkawes 2014). In this case, /r/ freely alternates with /l/

and this usually occurs in fast or casual speech. While alternating forms between flap [ɾ] and trill [r] are both regarded as standard variants, the replacement of /r/ with /l/ or, in initial cluster, /r/-cluster deletion is regarded as a non-standard feature. In formal context, native speakers of Thai are expected to produce the flap [ɾ] or trill [r] to maintain /r/-/l/ distinction prevocally. According to Harris (1996), the prestigious standard [r] is favoured in speakers working in the formal contexts of media, news announcement, and educational arena who sometimes also replace /r/ with /l/ or delete /r/ as the cluster member. As a result, it should be the case that /r/-/l/ merger is highly non-standard for some careers in Thai, such as in speech of newscasters, television and radio announcers, and teachers who are expected to use the standard /r/.

Because the use of /r/ and /l/ is usually sociolinguistically governed, many previous studies have investigated the contrast between /r/ and /l/ in terms of extralinguistic factors, such as age, gender, education, occupation, and especially speech style (Beebe 1974; Beebe 1980; Treyakul 1986; Chunsuvimol 1993; Pulsup 1993; Phootirat 2012; Panyaatisin 2013; Pookkawes 2014). These previous studies confirm that the /r/ and /l/ contrast is maintained in more formal registers and is neutralised to /l/ in informal registers. In other words, /l/ becomes an allophone of /r/ prevocally in both initial and initial cluster positions, despite the non-standard status, as shown in Figure 2.1.

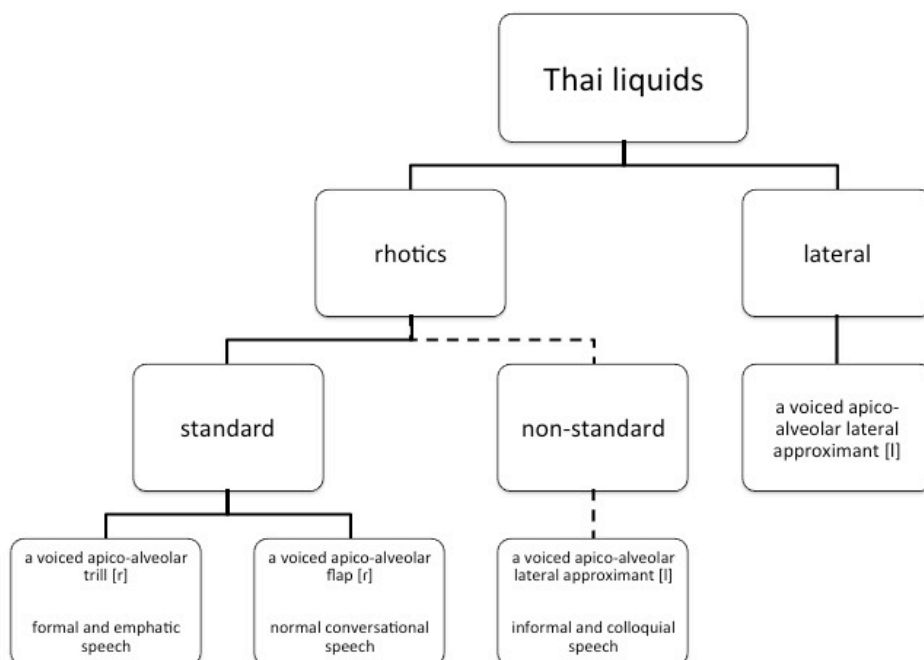


Figure 2.1: Liquids in Thai according to stylistic factors

What this means is that the liquids in Thai display a variation which is usually governed by

speech style. It can be seen in examples 2a) and 2b) that /r/ and /l/ are in fact two separate phonemes in formal contexts; however, /l/ can be an allophone of the phoneme /r/ resulting in the substitution of /l/ for /r/ in informal or casual speech. Likewise, the replacement of /r/ with [l] is also the case for the initial cluster as in 2e). As evidenced by 2b), 2d), and 2e), the phonological process of /r/-/l/ merger in Thai involves the merger of /r/ and /l/ to either /l/ or the deletion of both /r/ and /l/ as cluster members (Phootirat 2012: 132). Beebe (1974: 232) suggested that, among the variants of /r/ in the syllable-initial position, [l] has the lowest status, as in [lā:] ‘fungus’ in 2b). With the initial cluster in 2e), according to Beebe (1974: 233), the lateral [l] occupies an intermediate position of being non-standard because the null variant or /r/-cluster deletion [∅] is associated with lower status, as in [k̄ɔ̄:ŋ] ‘to filter’, than is substitution with /l/, as in [kl̄ɔ̄:ŋ] ‘to filter’.

(2)	Word	Standard realisation	Non-standard realisation
a.	/lā:/ ‘donkey’	[lā:]	
b.	/rā:/ ‘fungus’	[rā:] / [lā:]	[lā:]
c.	/k̄ɔ̄:ŋ/ ‘to accumulate’	[k̄ɔ̄:ŋ]	
d.	/kl̄ɔ̄:ŋ/ ‘drum’	[kl̄ɔ̄:ŋ]	[k̄ɔ̄:ŋ]
e.	/kr̄ɔ̄:ŋ/ ‘to filter’	[kr̄ɔ̄:ŋ] / [kl̄ɔ̄:ŋ]	[kl̄ɔ̄:ŋ] / [k̄ɔ̄:ŋ]

It is worth noting that all rhotic variants are pronounced as voiced rhotics word-initially in Thai. When /r/ as a cluster member follows aspirated voiceless stop consonants, /r/ becomes devoiced, as in 3a) (Phootirat 2012: 16). In relation to the lateral [l], although word-initially the lateral does not seem to show variation as in 2a) above, its allophone - a devoiced dental-alveolar [l̥] - is in fact produced when the lateral [l] is followed by close front vowels, namely [i] and [i:] (Phootirat 2012: 18). In addition, like /r/ in an initial cluster, the lateral [l] is devoiced when following aspirated voiceless stop consonants, as in 3b).

(3)	Initial position	Initial cluster position
a.	/r̄ɔ̄:ŋ/ ‘to carry’	/k̄ ^h r̄ɔ̄:ŋ/ ‘to occupy’
b.	/l̄ɔ̄:ŋ/ ‘to try’	/k̄ ^h l̄ɔ̄:ŋ/ ‘canal’

Another rhotic variant is the approximant [ɹ]. In general, speakers of Thai do not commonly use this variant. The approximant [ɹ] is usually heard in speakers who had studied

in international schools in Thailand or abroad (Beebe 1974: 119) and were fluent in English (Chunsuvimol 1993; Phootirat 2012). Because the approximant [ɹ] is not typical in Thai, it is not included in Figure 2.1 above. In this sense, although both the approximant [ɹ] and lateral [l] are non-standard Thai rhotics, pronouncing the approximant [ɹ] is more associated with the standard status than the replacement with the lateral [l] because, at least, the distinction between /r/ and /l/ is still maintained. For this reason, the use of the flap [ɾ], trill [r], and approximant [ɹ] as prevocalic /r/ variants is considered to represent ‘/r-/l/ distinction’, while the substitution with the lateral [l] or /r/-cluster deletion [Ø] is considered ‘/r-/l/ merger’ in the present study. As a result, the three former rhotic variants are relatively ‘acceptable’, while the latter features, lateral [l] or /r/-cluster deletion [Ø], relate to ‘unacceptable’ sounds.

In addition to stylistic variation, there is free and individual variation in the production of trills, flaps, and laterals in positions where standard Thai rhotic trills and flaps are required. According to Lindau (1985: 161), the phoneme /r/ is realised differently across speakers, and speakers using trills also produce other variants. This is indicative of a continuous rather than categorical variation. This variation of an unconscious process reflects how a language phonetically changes. Cross-linguistically, Lindau (1985) and Ladefoged and Maddieson (1996) observe that rhotic sounds are creating a wide range of variations. We can include Thai as another language with /r/ variability including the prestigious standard trill [r], standard flap [ɾ], and non-standard lateral [l] in relation to variation within speakers in different speaking contexts or between speakers within the same speaking context.

As can be seen in examples 1a) and 1b) above, producing the lateral [l] in a phonological rhotic environment changes the meaning of a word because these liquids historically form minimal pairs and contrast. When the Thai phonemes /r/ and /l/ are pronounced interchangeably in various contexts with words which historically use one liquid or the other, the merger of /r/ and /l/ in Thai does not usually cause problems in lexical understanding in communication. This is because clues in the context can refer to words with completely different meanings as can be seen in examples 2a) to 2e) above.

2.2.2 Liquids in English

This section turns to the second language of the participants in the present thesis. In the English spoken in England and RP (British Received Pronunciation), two liquids are distinguished with a single type of rhotic sound, a voiced alveolar approximant [ɹ], and a single lateral [l], a voiced alveolar lateral approximant [l], as can be seen in Figure 2.2.

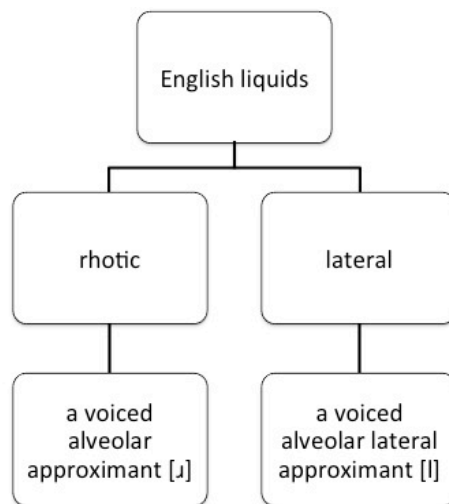


Figure 2.2: Liquids in English

Historically, both of these two liquid phonemes are allowed to appear prevocally and postvocally in English, as in 4a) and 4b).

- (4) a. ‘rock’ ‘crock’ ‘bar’ ‘barn’
 b. ‘lock’ ‘clock’ ‘ball’ ‘balls’

A rhotic accent involves pronunciation of a postvocalic /r/, whereas RP and many other dialects of English are regarded as non-rhotic by omitting the postvocalic /r/, as shown in 5a).

- (5) Rhoticity Non-rhoticity
 a. [kɑ:ɹ] ‘car’ [kɑ:] ‘car’

RP uses a prevocalic approximant and non-rhotic pattern as its standard forms. Although a voiced alveolar or post-alveolar approximant is the main variant in most English accents, either the trill [r] or tap [ɾ] is also regarded as the main rhotic in the Welsh language (Morris 2013: 31). According to Davenport and Hannahs (2010: 32), the tap [ɾ] is the feature of English used in Scotland. In addition, the voiced uvular trill [ʀ] and uvular approximant [ʁ] are features of English pronunciation in North Wales (Jones 1984: 50, cited in Morris 2013: 64). Postvocally, however, /r/ is pronounced only by rhotic speakers.

As far as the lateral /l/ is concerned, in many accents of English, the lateral involves two allophones, a clear [l] and a dark [ɫ] regulated by context and accent patterns of each dialect or language. While the clear [l] is pronounced as the alveolar lateral approximant [l] occurring prevocally, the dark [ɫ] is produced with the velarised alveolar lateral

approximant [ɹ] produced in the postvocalic position. Although the variants of English /r/ and /l/ occur in both prevocalic and postvocalic positions, the primary focus of the present study is the phonological variation of the prevocalic /r/ because the absence of the liquids in the postvocalic position in L1 Thai prevents comparison of phonological variation in L1 Thai and L2 English.

Generally, rhotics in both Thai and English are produced with different articulatory motions. As has been previously mentioned, Thai rhotics differ from those of the English approximant [ɹ], while both languages have the laterals in common. However, it might be the case for some speakers that rhotics in both languages seem to be the same. In this sense, native speakers of Thai possibly recognise the English approximant [ɹ] as equivalent to the Thai rhotics. In terms of a systematic comparison between the native and target language, it seems that there is more phonetic similarity between the trill [r] and flap [ɾ] than the approximant [ɹ]. According to Lindau (1985: 166), the trill [r] and tap [ɾ] share acoustic features and short closure duration, and so ‘a trill can be regarded as a series of taps’ and ‘taps look very much like the closure phase of a trill’. In other words, the duration of the tap [ɾ] is thus comparable to a single pulse of the trill [r]. According to Punnoose (2010: 7), at least 45 out of the 85 languages, which feature the trill [r] have the tap [ɾ] as the allophone.

The next section explains phonotactics in L1 Thai and L2 English.

2.3 Phonotactics in Thai and English

Thai and English also differ in their phonotactics on consonants and consonant clusters. These two languages allow different combinations of vowels and consonants to form a syllable. In other respects, the two languages differ widely. Thai words are monosyllabic, with most compounds and polysyllabic words being loanwords, especially from Pali and Sankrit used in politic, royal, and religious contexts (Phootirat 2012: 8). Thai is a tone language whose syllables are composed of four components: an onset, nucleus, an optional coda, and a tone. Like in English, both sonorant and obstruent consonants can fill the syllable-initial and optional syllable-final consonant slots in Thai.

2.3.1 Tone in Thai

In Thai, the relative pitch of an utterance changes the core meaning of each word, and so each syllable must be pronounced with a tone to be correctly understood. The five contrasting tones in Thai are transcribed as mid, low, falling, high, and rising, as shown in Table 2.1.

Tone	IPA	Tone symbol in Thai
Mid tone	—	no mark
Low tone	— _˘	— [˘]
Falling tone	— ^ˆ	— ^ˆ
High tone	— ^ˊ	— ^ˊ
Rising tone	— _ˋ	— ^ˋ

Table 2.1: Five contrasting tones in Thai

In a phonological sense, the syllable sometimes does not retain its underlying tone. There is an interaction of tone with stress, and the lexical tone is realised only for stressed syllables. Monosyllabic content words and prosodic head syllables that fall at the right edge of a polysyllabic word are regarded as stressed syllables and therefore retain their lexical tone (Luksaneeyanawin 1998: 376). In the unstressed syllables of polysyllabic compound words, lexical tones undergo alterations known as tonal neutralisation or tone sandhi and this is towards the mid tone. For this reason, the underlying tone of the first syllable of polysyllabic words will be reduced to mid tone, as in [t^hū.rá] for /t^húʔ.rá/ ‘business’, [k^hā.nǒm] for /k^hàʔ.nǒm/ ‘dessert’, and [cā.wàk] for /càʔ.wàk/ ‘a ladle’. With regard to tonal neutralisation in Thai, there is no loss of meaning contrast.

2.3.2 Word-initial consonant clusters in Thai

Thai allows consonant clusters to occur only word-initially and medially. In other words, only two-consonant clusters in the prevocalic position and a single consonant in the postvocalic position are allowed in Thai. Thai has simpler syllable shapes than those in English; for example, the largest Thai syllable is CCVVC, such as in [krà:p] ‘to prostrate’ (Panlay 1997: 21). There are also restrictions on which consonants can occur together. To put it simply, the first members of initial clusters include the voiceless stops /p, t, k, p^h, t^h, k^h/, and only the three phonemes /r, l, w/ are allowable as a second member in an initial cluster. However, /l/ cannot follow /t, t^h/ and /w/ is allowed to follow only /k, k^h/ in forming initial clusters. Table 2.2 below summarises the permissible clusters in Thai.

Cluster member	/#p_/	/#p ^h _/	/#t_/	/#t ^h _/	/#k_/	/#k ^h _/
/#Cl_/	pł [plā:] ‘fish’	p ^h ł [p ^h lā:ŋ] ‘while’			kł [klā:ŋ] ‘middle’	k ^h ł [k ^h lāŋ] ‘storehouse’
/#Cr_/	pr [prūŋ] ‘to cook’	p ^h r [p ^h rā] ‘monk’	tr [trā:] ‘symbol’	t ^h r [cān.t ^h rā:] ‘moon’	kr [krip] ‘be quiet’	k ^h r [k ^h rū:] ‘teacher’
/#Cw_/					kw [kwā:ŋ] ‘be wide’	k ^h w [k ^h wāŋ] ‘smoke’

Table 2.2: Permissible initial cluster in Thai

2.3.4 Word-initial consonant clusters in English

According to the maximal allowable English syllable shape CCCV(V)CCCC, consonant clusters are permitted either in initial, medial, or final positions. However, it is the case that English has more limitations on the combination and order of consonant clusters in the postvocalic position than those in initial clusters. The permissible prevocalic consonant clusters are either two- or three-consonant clusters. The longest allowable final consonant in a syllable in English is C(C)VCCCC, as in ‘*twelfths*’ and ‘*sixths*’. Constraints for initial clusters suggest that if the second member in a two-consonant cluster is a liquid /l, r/ or a glide /j, w/, the first member has to be a stop or fricative. When the first member is /s/, the second has to be /p, t, k, l, f, m, n, w/. The possible two-consonant clusters in English are presented below in Table 2.3. English permits up to a three-consonant cluster or a CCC-onset whose first cluster member has to be /s/, the second member has to be a voiceless stop /p, t, k/, and the third has to be a liquid /l, r/ or a glide /j, w/. Thus, the possible three-consonant clusters in English are /spl/ ‘**s**plit’, /spr/ ‘**s**pray’, /str/ ‘**s**t**r**ong’, /skl/ ‘**s**clera’, /skr/ ‘**s**cr**a**m’, and /skw/ ‘**s**quid’.

Cluster member	/#p_/	/#t_/	/#k_/	/#b_/	/#d_/	/#g_/	/#f_/	/#v_/	/#θ_/	/#s_/	/#m_/	/#h_/	/#ʃ_/
/#Cl_/	plum		click	block		glow	flour			slow			schlep
/#Cr_/	prune	train	cream	bright	drum	grill	freeze		through				shrink
/#Cw_/		twin	queen		dwel				thwart	swim			schwa
/#Cj_/	pure	tune	cute	beauty	dune		few	view			mute	huge	
/#Cm_/										small			schmuck
/#Cn_/										snail			
/#Ct_/										still			
/#Ck_/										skill			
/#Cp_/										spell			spiel
/#Cf_/										sphere			

Table 2.3: Permissible initial cluster in English

It should be noted that, in the presence of jod, some words have one orthographic initial letter, but these words will be pronounced as if they have a two-consonant cluster, as in ‘cute’, ‘beauty’, ‘few’, and ‘huge’. This is because the /j/ is in fact regarded as a consonant preceding a vowel [u:], as in [kju:t] rather than *[ku:t] for ‘cute’.

As can be seen in Tables 2.2 and 2.3 above, only the English clusters /pl, pr, tr, kl, kr, kw/ have a one-to-one relationship with the Thai /p^hl, p^hr, t^hr, k^hl, k^hr, k^hw/. Other two- and three-consonant English clusters are not permitted in Thai, however. Obviously, while English has a greater number of shapes of intervocalic consonant clusters, only the VC.CV and VC.CCV structure are allowed in Thai.

The next section focuses attention on the existing literature in regard to L1 acquisition relevant to the present study.

2.4 Influence of linguistic factors on L1 phonology

This section includes an analysis of empirical work related to production variation in terms of linguistic factors including syllable stress and the phonetic context preceding the segment in question.

2.4.1 Syllable stress

Syllable stress is selected as an independent variable in the present study because of the interaction of tonal and stress pattern in Thai, discussed in Section 2.3.1 above. Existing studies revealed the effect of stress behaviour on segmental behaviour. The following studies may help to make clear why it should be the case that standard variants are found to be more frequent in stressed rather than in unstressed syllables. Fasold's (1972) investigation of /-t, -d/ deletion in weak past tense verbs by Washington D.C. African American speakers found that the following segment was the strongest factor influencing the deletion of /-t, -d/, followed by syllable stress, with the deletion being adopted at a higher rate in unstressed than in stressed syllables. Wolfram (1972) also examined /-t, -d/ deletion in Puerto Rican and African American teenage male speakers. Wolfram reported that the most influential constraint which conditioned the speech of both groups of participants was the following segment and then syllable stress, with deletion being accomplished in unstressed more often than in stressed syllables. Similar results for the effects of stylistic and stress variation of /-t, -d/ deletion of the final cluster, such as in 'told' or 'lost' in the King of Prussia area of Philadelphia among both adults and child were found by Labov (1989). He found that the form of /-t, -d/ deletion that a seven-year-old boy selected followed the patterns in his father's and mother's speech and that deletion took place more frequently in unstressed than stressed syllables, as in 'just a minute' and 'brushed it off'.

2.4.2 Preceding segments

It has been reported in the literature that the linguistic factor of the phonetic context preceding the segment in question plays a role in shaping phonological variation. Labov (1989) found that, in both the aforementioned a seven-year-old boy and his parents, the final /-t, -d/ was more likely to be deleted when the cluster followed a third consonant, as in 'next' and 'wouldn't', than when it followed a vowel, as in 'nest' and 'opened'. Baranowski and Turton (2015) investigated the phonological process of H-dropping, such as 'ouse' for 'house' in Manchester English among 86 speakers stratified by age, gender, and socio-economic status. With regard to the effect of the preceding sound, it was found that H-dropping was less likely to occur when /h/ followed a pause, as in 'hopefully', than when /h/ followed a vowel or consonant, as in 'behind'. The reason why the preceding pause impeded the process of H-dropping was thought to be the effect of initial strengthening (Keating *et al.* 2003, cited in Baranowski and Turton 2015: 302). In addition, Baranowski and Turton suggested that H-dropping was more likely to be expressed in informal contexts of interviews than in word list

and minimal pair reading wherein standard forms were produced. According to Keating *et al.* (2003), the effect of initial strengthening on an initial segment leads to a stronger articulation. The speaker has more time to process what is coming and to aim for the standard, non-H-dropped variant. It is then expected in the present study that a preceding pause will show the highest rates of the /r/-/l/ distinction in comparison with a preceding vowel or a preceding consonant in both L1 Thai and L2 English.

2.5 Influence of extralinguistic factors on L1 acquisition

2.5.1 Speech style and socioeconomic status

Cross-linguistically, sociolinguists have reported relationship between external factors and variation. One of the earliest studies focusing on speech style was that of Labov (1966), who conducted a sociolinguistic study of salespeople in three department stores in Manhattan representing stores serving three social classes in both casual and emphatic speech. It is the case that, historically, the New York City exhibited non-rhotic or r-less features and was characteristically regarded as a stigmatised variant. Labov asked questions in the answers to which the post-vocalic /r/ in the lexical item ‘fourth floor’ was expected to be pronounced, to investigate whether the postvocalic /r/ was either pronounced or omitted. In this study, Labov found that the use of the postvocalic /r/ in New York City was stratified by social class. That is, the higher the socioeconomic status of the employees, the more frequently the speakers preserved the postvocalic /r/. Moreover, the results of Labov’s study reflected stylistic stratification suggesting that non-rhotic accent more frequently occurred in informal contexts. The speakers pronounced /r/ more often when they paid closer attention to their speech, which increased in formal settings. Generally speaking, in Labov’s study, higher social class and more formal contexts increases the frequency of use of standard forms in New York City. In addition, it was found that the postvocalic /r/ was omitted more often in ‘fourth’ than in ‘floor’ which might be explained from the perspective of markedness. The final cluster in ‘fourth’ is more marked than the singleton in ‘floor’ and ‘floor’ is therefore predicted to be less difficult to produce. For further details on the markedness, the reader is directed to Section 3.2.2, Chapter 3.

2.5.2 Area, home language, sex, and speech style

In the study of /r/ and /l/ variation, Morris (2013) investigated the influence of linguistic as well as extralinguistic factors in both the English and Welsh of bilingual speakers. In Welsh, the voiced alveolar tap [ɾ] and voiced alveolar trill [r] are considered the main variants, while

the voiced alveolar approximant [ɹ] was in variation with the Welsh variants. The data were collected from 32 Welsh-English bilinguals using a variationist sociolinguistics methodology. The study also compared differences in oral production between those in an area of the North-West where Welsh is predominantly used by the local population, and in the North-East where English is spoken by the majority of people in the community. It was found that English [ɹ] tends to be lighter than Welsh [ɹ] in the word-initial onset position for females, and in the word-medial intervocalic position for both genders. The realisation of r-ful was more likely to be heard in those from North-West Welsh in stressed syllables and in more careful speech, which was similar to Labov's (1966) findings cited in Section 2.5.1. For the production of /r/, the results indicated that, in Welsh speech, the production of the approximant [ɹ], which was governed by the influential interacting factors of area, home language, and sex, was widespread. The data also showed that female speakers were found to produce more frequently than male speakers the standard feature of the voiced alveolar trill [r] rather than the alveolar approximant [ɹ]. Moreover, the speech production in the North-West influenced the pronunciation of English in the same region. The use of the coda /r/ and the production of [r] and [ɹ] in English were more likely to be used by those from Welsh-speaking homes in the North-West.

These two abovementioned studies confirm that extralinguistic factors play a role in sound variation in English. The next section deals with the oral production liquids in L1 of Thai speakers.

2.6 Production of liquids in L1 Thai by native speakers of Thai

The existing literature regarding /r/ and /l/ variation in Thai has confirmed a relationship between /r/ and /l/ variations and sociolinguistic factors. This section explains the production of liquids by native speakers of Thai in the L1. It is the case in Thai that the merger of /r/ and /l/ is regarded as a stylistic variation. The study of variation in the prevocalic /r/ and /l/ has thus received particular attention from scholars. Their findings are described in the following paragraphs.

Beebe (1974) examined whether or not pronunciation with certain initial consonant clusters whose second cluster members were /l/, /r/, and /w/ conformed to standard Thai. The target words were in Thai. Beebe recorded interviews with 151 Thai speakers and considered four independent variables of age, professional classes, educational level, and speech style. Beebe found that /w/ was the least often omitted in relation to either /l/ or /r/ by all professional classes, with the /l/ cluster being more frequently preserved than the /r/ cluster.

Subjects with higher occupational or educational levels, and older speakers more frequently maintained /r/ as the cluster member. Higher rates of cluster retention by older speakers in Beebe's study led to the conclusion that the preservation was the form most used in the past, while cluster deletion [Ø] was a more recent innovation. The prestigious form was also found in formal rather than informal speech.

Treyakul (1986) explored the variation of /r/ and /l/ in the initial position, as in /lâ:t/ 'to pave' and /râ:t/ 'king', and in initial clusters, as in /plā:ŋ/ 'while' and /prā:ŋ/ 'to disguise', by 28 Thai newscasters. The tasks considered included interviews, news announcements, passage reading, and minimal pair reading. The findings showed that, in the most formal context of minimal pair reading, the prestigious standard Thai trill [r] was selected in the initial position almost all of the time at 91.7% and with the standard flap [ɾ] 8.3% of the time. With regard to news announcements and passage reading, the frequency of use of the standard flap [ɾ] and trill [r] is still higher than the production of the non-standard approximant [ɹ] and lateral [l] while, in the least formal style of interviews, the non-standard lateral [l] was adopted most frequently, followed by the standard flap [ɾ], non-standard approximant [ɹ], and prestigious standard trill [r]. The more frequent use of the standard flap [ɾ] and trill [r] in the initial position in minimal pairs, passage reading, and news announcements was similar to the proportion found the initial cluster, except for in interviews. With regard to /r/ occurring in the initial cluster in interviews, rather than showing a preference for the lateral [l], the subjects showed a tendency towards /r/-cluster deletion [Ø]. In news announcements and passage reading, initial /r/-cluster was realised as the flap [ɾ] most frequently, while the speakers preferred to use the trill [r] in minimal pairs. For the initial /l/, the lateral [l] was realised almost all of the time in all tasks. With regard to the initial cluster of /l/, the lateral [l] was omitted most frequently in interviews. However, the lateral [l] was selected at rates higher than 90% in the other three tasks.

Chunsuvimol (1993) explored how the sociolinguistic factors of gender, occupational level, and English background affected the use of the prevocalic /r/ in L1 Thai and L2 English of 58 Thai speakers working in three first-class hotels in Bangkok, Thailand. The participants were tape-recorded in single interviews with the researcher in Thai and with an English native speaker in English. It was found that gender, occupational level, and experience in English all played crucial roles. That is, the standard Thai flap [ɾ] was more frequently heard in the production of females, in subjects at higher occupational levels, and those with more experience in English. The females were also more conscious of producing the prestigious standard trill [r] than males. The non-standard variants [l] and [Ø] were the predominant

variants in the initial and initial cluster position respectively. The /r/-cluster deletion [Ø] was produced more than 50% of the time by both genders, with higher rates by the males.

Pulsup (1993) examined how /r/ and /l/ in an initial cluster were produced by 30 Thai female students. The tasks considered included five contexts of casual conversation, interviews, passage reading (16 tokens) as in /pràp/ ‘to change’, word-list reading (9 tokens) as in /krā:m/ ‘jaw’, and minimal pair reading (8 tokens) as in /k^hrɔ̃:ŋ/ ‘to occupy’ ranging respectively from lowest to highest level of formality. It was revealed that both liquids as cluster members were retained according to degree of formality. Clusters were more frequently deleted in the less formal contexts of casual conversation, interviews, and passage reading. In contrast, the subjects were more likely to preserve the standard form of the cluster member rather than cluster deletion [Ø] or the substitution of /r/ for /l/ or /l/ for /r/ in the more formal tasks of word-list and minimal pair reading.

Panyaatisin (2013) compared the production of the variable /r/ in an initial cluster, as in /krā:m/ ‘jaw’, between native speakers of Thai and Chinese/Teochew-Thai subjects who could speak both Thai and Teochew Chinese. The fifteen subjects living in Hao Lam Phong of Bangkok, Thailand, an area with a large Chinese population, read the cluster /r/ in three tasks associated with different degree of formality, including an interview, passage reading, and minimal pair reading. It was found that Chinese/Teochew-Thai speakers retained the standard variants at slightly higher rates than did native speakers of Thai. In general, however, both groups showed the similar distributional pattern in all three tasks and the difference was not statistically significant. In Panyaatisin’s study, [r] refers to both tap and trill as these two variants are standard rhotics in Thai. In the most formal context of minimal pair reading, the standard Thai [r], which was not heard at all in interviews, was most frequently produced. With passage reading, the non-standard [l] was most often used, followed by [r] and then [Ø], by both groups. In the least formal style of an interview, the non-standard feature [Ø] was adopted most frequently in both. It can thus be concluded that ethnicity did not play a vital role in the variation. There were more important factors which may have enabled Chinese/Teochew-Thai speakers to slightly better acquire the standard Thai /r/. For example, the more recent generations of subjects increasingly needed to use Thai in daily communication and Chinese only in the family. Moreover, the Chinese subjects had higher educational levels than the native speakers of Thai living in the same area. In addition, the close relationships among Chinese/Teochew-Thai speakers in the community promoted identity and network strength.

Pookkawes (2014) explored the use of the variable /r/ in initial positions, as in /rót/ ‘car’, and initial clusters, as in /trōŋ/ ‘be straight’, in Thai of 30 native speakers of Thai considering the effect of extralinguistic factors of age, gender, education, and speech style. Her findings showed that the non-standard lateral [l] was the predominant variant in an initial position, followed by the standard flap [ɾ], the standard trill [r] and the non-standard approximant [ɹ]. In an initial cluster, /r/-cluster deletion [Ø] was the most preferred variant, followed by the production of the standard flap [ɾ], the non-standard lateral [l], and the standard trill [r]. The [l] in initial position and /r/-cluster deletion [Ø] in initial cluster were common in younger speakers. It is thus the case here that deletion is more of a recent development of a simplification strategy due to its use in the younger group more than in the older speakers. While males showed higher rates of the lateral [l] realisation in initial position, female counterparts, in initial cluster, were more likely to delete /r/ than males. Speakers with higher educational level were more likely to use the standard features in both initial and initial cluster positions. In relation to speech style, the standard variants were preserved in the formal context. It was confirmed in Pookkawes’s findings that the variation of /r/ in both phonological environments was constrained by sociolinguistic factors.

2.7 Summary

As can be seen in this chapter, both Thai and English allow /r/ to occur in an initial and initial cluster positions. However, the prevocalic /r/ in L1 Thai and L2 English differs. While Thai permits the flap [ɾ] and trill [r] as the standard rhotics, the standard rhotic in L2 English is the approximant [ɹ]. That is to say, Thai has two rhotics, but English allows only one rhotic in sound inventories. In addition, the prevocalic /r/ in L1 Thai can be realised as the lateral [l] and /r/-cluster deletion [Ø], regarded as non-standard variants. The findings from previous research into the prevocalic /r/ in L1 Thai, taking extralinguistic factors into consideration, confirm the occurrence of the merger of /r/ and /l/ in Thai. This chapter provides the background of liquids inventories and permissible consonant clusters in L1 Thai and L2 English altogether with the existing literature in L1 acquisition which is related to the present study. While L1 acquisition is the major focus in this chapter, the following chapter, Chapter 3, focuses on L2 phonology. It presents the theoretical frameworks and describes major findings of previous studies in L2 acquisition relevant to the present study.

Chapter 3. L2 Phonology

3.1 Introduction

The present study focuses on an overview of L2 phonology acquisition in Thai learners of English. It explains phonological variation in the prevocalic /r/ from the perspectives of markedness and transfer. Its primary aim is to investigate how the speakers acquire the segment in question in L2 and which linguistic variants tend to be transferred to L2 English more frequently, the marked standard Thai rhotics or unmarked non-standard variants. It should be noted again that, in Thai, the standard variants, the flap [ɾ] and trill [r], are more marked, while the non-standard features, lateral [l] and deletion [Ø], are considered less marked. Moreover, the present study explores additional factors which may influence the choice of variants in the L1 Thai and L2 English. The theoretical framework for L2 acquisition and previous studies regarding the influence of markedness, transfer, and extralinguistic factors on L2 acquisition are discussed in this chapter.

In this chapter, each of six sections summarises: 1) theoretical framework for L2 acquisition, 2) theoretical principles of quantitative paradigm, 3) the influence of markedness and transfer on L2 phonology acquisition; 4) the influence of speech style on L2 phonology acquisition; 5) the L2 production of liquids by native speakers of Thai; and 6) research questions.

The next section focuses attention on the role of markedness and transfer effects in L2 phonology.

3.2 Theoretical framework for the acquisition of L2 phonetics and phonology

It is well known that the processes of first language (L1) acquisition and second language (L2) acquisition are conditioned by many factors. This section deals primarily with the conceptual framework for the acquisition of L2 phonology adopted in the present study, which involves markedness and transfer theory (Eckman 1977). The present study argues that the phonological modification of rhotics in favour of the lateral [l] and deletion [Ø] can be explained by considering the preference for unmarkedness. With regard to the frequency-based markedness hierarchy of the consonant inventory of /r/ and /l/ (Maddieson 1984), the lateral [l] is considered relatively unmarked feature in comparison with rhotics. The present study thus explores how markedness and transfer effects interact in L2 English speech production and demonstrates whether the Markedness Differential Hypothesis (MDH)

proposed by Eckman (1977) is effective in providing a plausible explanation for errors L2 learners make in learning L2 English. The detail of the MDH is clarified below in Section 3.2.2.

The MDH has been employed in the present thesis for three reasons. First of all, few studies have been carried out to look at interlanguage phonology in Thai in accordance with the MDH. Secondly, the present study argues that the interaction of the two effects - markedness and transfer - can represent a step forward by incorporating markedness into Lado's (1957) CAH because particular structures cannot be justified by only universal rules of markedness or only transfer from the learner's native language. Thirdly, the Eckman's (1977) MDH, according to linguistic typology and L2 phonology, has already shown its validity in predicting the difficulties L2 learners may encounter.

The effect of transfer in the light of the Contrastive Analysis Hypothesis (CAH) proposed by Lado (1957) on L2 acquisition is the focus of the next section.

3.2.1 Phonological transfer and the Contrastive Analysis Hypothesis (CAH)

The role of the L1 in L2 acquisition and the idea of transfer were originally proposed by Lado in 1957 in his Contrastive Analysis Hypothesis (CAH). The idea has long been that transfer takes place when L2 learners use the L1 knowledge to aid learning in the L2. Phonological transfer concerns 'the ways in which a person's knowledge of the sound system of one language can affect that person's perception and production of speech sounds in another language' (Jarvis and Pavlenko 2008: 62). In this way, it will always be the case that the speaker's L1 will have an impact on interlanguage (IL) development (Odlin 2003, Eckman 2004, Ringbom 2007). In Lado's CAH, he suggests that: a) the productive and receptive skills of L2 learners are influenced by their L1; b) differences in the L1 and L2 result in difficulties in language learning but similarities lead to success; and c) there is positive and negative transfer or interference. L1 transfer is divided into two types of positive and negative transfer. Under the CAH, while positive transfer facilitates and eases the process of learning an L2 due to similarities between two language systems, negative transfer occurs as interference resulting from the differences between features or structures in two languages.

The study of Dulay and Burt (1974) investigating the syntactic errors of Spanish ESL learners examined to what extent NL interference and developmental strategies caused difficulties. It was found that less than 5% of all errors were attributed to transfer; and, on the other hand, approximately 90% of errors were related to developmental factors. For this

reason, it is the case from Dulay and Burt's study that developmental strategies should be considered in predicting learners' difficulties. The findings of their study thus did not accord with the predictions of the CAH in the sense that all errors were associated with transfer. In addition, according to Khattab (2000), there exists a difference in voice onset time (VOT) in monolingual and bilingual representation, in that the bilinguals were found to produce different VOT patterns for each language, which were sometimes also different from those of monolingual speakers. In her study, the factor of developmental features did play the crucial role rather than language interference.

Eckman (2004) agreed that acquirers would find sounds similar to or existing in their mother tongue easier to produce. On the other hand, L2 learners will have difficulty in learning sounds and structures which do not occur in their L1. Based on the CAH alone, the present study can predict that L2 Thai learners of English are influenced by negative transfer from L1. The CAH, however, runs into trouble because, like other theories, it cannot completely predict the errors L2 learners make (Selinker 1992; Flege 1995; Major 2001). In contrast to Lado's (1957) CAH, the Speech Learning Model (SLM) proposed by Flege (1995) suggests that closer or similar sounds in two languages are more likely to cause learning difficulty, while novel features in L2 result in success in L2 learning. In addition, universal factors may be reflected in speech production as well. That is to say, although there has been a waning of interest in contrastive analysis (CA) as the sole explanation in L2 phonology, the interaction of transfer with universal factors does shed significant light on L2 phonology at both the segmental and suprasegmental levels (Major 2008: 68).

3.2.2 Universals of phonology and markedness

The L2 phonology literature discusses phenomena which result from markedness universals which apply to all grammars. Generally speaking, second language acquisition (SLA) research on universals has been conducted from two different approaches: Universal Grammar (UG) according to Chomsky and the typological framework by Greenberg (1966). While UG, also known as the Chomskyan tradition, focuses primarily on innate universals from the in-depth study of languages to make predictions concerning the language acquisition process (White 1987, 1989, 2003; Archibald 1993; Yip 1995), the typological approach deals mainly with cross-linguistic comparisons of a wide range of the world's languages to arrive at typological generalisations across languages. In SLA, this is evident in the work of Eckman (1977, 1991, 2004), Gass (1979, 1989, 1995), and Hyltenstam (1984). Studies in SLA within the typological perspective, as a result, concern surface variations in L2. The term

‘markedness’ in the present study will thus be based, rather than on universals connected to UG, on universals relating typological markedness. The present study will offer another case study on L2 acquisition of the prevocalic /r/ of Thai learners of English.

The terms marked and unmarked were introduced by Trubetzkoy (1931) in an article entitled ‘Die phonologischen Systeme’ in the Prague school phonology, and were also extended to morphology and syntax. Phonologically, the distinction between marked or unmarked is the absence or presence of a single distinctive feature such as property of voicing of the features. While the voiced features are considered marked, those voiceless features which lack voicing are associated with unmarked. For this reason, there exists a distinction between two features or structures as to whether they are marked or unmarked. In general, markedness universals are defined in several ways, including via implicational hierarchies, statistical frequencies, and L1 acquisition (Major 2008: 78).

With regard to an implicational hierarchy (Greenberg 1978), a cluster of length N in a language implies clusters of length N-1, so a cluster of length N is more marked than a cluster of length N-1. To put it simply, the longer the clusters are, the more marked these clusters will be. For Thai, it is found that /r/ as the second cluster member might be deleted, as in [k̄ɔ̄:ŋ] for /kr̄ɔ̄:ŋ/ ‘to filter’. For this reason, [k̄ɔ̄:ŋ] is relatively unmarked, while [kr̄ɔ̄:ŋ] or [kr̄ɔ̄:ŋ] ‘to filter’ is relatively marked according to implicational hierarchy. In this sense, the speakers are possibly more likely to delete /r/-cluster member rather than preserve it because the unmarked structures are easier and then acquired before the more marked structures. The prevocalic /r/ in L2 English might thus be modified towards the less marked structures of clusters of length N-1. In the present study, implicational universals are applied to explore the acquisition of the prevocalic /r/ only in initial cluster position. This is because implicational hierarchy, which explains the degree of markedness in terms of syllable structure - initial consonant (clusters of length N-1) and initial consonant cluster (clusters of length N) - does not account for the markedness hierarchy of consonant inventory of /r/ and /l/.

In terms of statistical frequencies, the markedness approach is responsible for the universal preferences across languages for certain linguistic features or structures other than others. Greenberg (1966) and Eckman (1977) observe that the less frequently the features or structures of pronunciation occur cross-linguistically, the more marked and thus more difficult the features or structures will be to acquire for learners learning their L1s and L2s. In other words, an unmarked segment is more widely distributed in the world’s languages. There are a number of syllable types that are preferred across languages, while other types are limited.

For example, syllables with onsets are preferred over syllables without onsets. According to Yavas (2005) and Burquest (2006), an open syllable or CV is found in all known languages. In addition, Rice (2007) suggests that the CV is allowed in a number of world's languages whose inventories do not permit closed syllables or CVC, as in Hawaiian, which does not allow any structures other than open syllables or CV. The universals hypothesis suggests that if the phonological features in the target language occur with lower frequency across languages, L1 and L2 learners will face potential pronunciation difficulties. It is also the case that unmarked features may have a greater frequency of occurrence within a particular language or within a particular context in that language.

With the influence of markedness on language acquisition, the prediction is that L1 learners acquire unmarked features or structures earlier than relatively marked features or structures (Jakobson 1941; Gnanadesikan 2004; Demuth 2011), and L2 acquirers are similar (Eckman 1977; Jin 2008). In this way, according to Jakobson (1941), less marked features are acquired before more marked features by children in L1 acquisition, which is the same in all the world's languages. This suggests a simple explanation as to why children begin language learning with CV syllables and why CV syllable types are regarded as the most common structure cross-linguistically (Hancin-Bhatt 2000). When markedness is referred to in L2 acquisition, L2 learners tend to favour unmarked structures and thus acquire an unmarked feature or structure before a corresponding marked feature or structure, which is similar to the case of child language acquisition (Jakobson 1941). To put it simply, marked features are more difficult to acquire than relatively unmarked features which might then emerge to substitute for the marked features.

In order to take into account both language universals and the learner's native language and to explain how markedness interacts with transfer, Eckman (1977: 321) proposed the Markedness Differential Hypothesis (MDH), which predicts the degrees of difficulty from a universal perspective. According to the MDH, unlike the Lado's (1957) CAH, not every difference between two languages causes learners difficulty. Including markedness effects provides an alternative to the CAH through predicting the 'directionality of difficulty' (Eckman 1987: 55). According to Eckman (2008: 98), a combination of typological markedness and the CAH is better able to predict relative difficulty in interlanguage phonology. From the MDH point of view, the differences between L1 and L2 are necessary yet insufficient because the differences can only reliably predict the L2 learners' difficulties when they are incorporated into typological markedness. The degree of difficulty directly corresponds to the degree of markedness. The MDH goes further in

indicating 1) the relative degree of difficulty, meaning that speakers show relative instead of equal difficulty that cannot be completely explained in the light of the CAH; 2) where differences between the L1 and L2 will and will not cause learning difficulty, and 3) why a particular structure is acquired before others. Thus, Eckman suggests that the ‘transfer approach’ should be combined with a ‘markedness approach’ to better complete the picture and measure these difficulties. The degrees of difficulty in L2 acquisition can be predicted by virtue of the markedness of differences between the L1 and L2, as summarised as follows (Eckman 1977: 321):

- 1) Those areas of the target language which differ from the native language and are more marked than in the native language will be difficult.
- 2) The relative degree of difficulty of the areas of the target language which are more marked than the native language will correspond to the relative degree of markedness.
- 3) Those areas of the target language which are different from the native language, but are not more marked than the native language, will not be difficult.

As noted above, not every difference between two languages leads to difficulty. With regard to the relationship between markedness and L1 transfer, for transfer from the L1 taking place when a feature in the L2 is more marked, transfer will be suppressed when a feature in L1 is relatively more marked. In relation to Ellis’s (1994) claim, when the L1 is less marked than the L2, the learner’s interlanguage grammar is generally unmarked. It can thus be predicted that, when L2 speakers are faced with marked features which are new, these speakers may modify the features into comparatively less marked features, especially the features allowed in their L1. In other words, when L2 learners encounter more marked features in acquiring L2, the speakers use their L1 grammar to assist in L2 acquisition and thus L1 transfer appears. It is worth mentioning here that, L2 Thai learners of English, from a phonetic point of view, might not notice the differences between Thai and English rhotics and judge them to be the same. In this way, L2 learners would recognise the English approximant [ɹ] as phonologically equivalent to the Thai flap [ɾ] or trill [r] despite their phonetic differences. For this reason, it can be the case that areas of difficulty may also arise from similarities of the rhotics in two languages. If this is the case, according to Flege’s (1995) SLM, the greater the similarity of the features in L1 and L2, the more difficult these sounds will be for learners. As a result, the perception of similarity between the Thai and English /r/ possibly lead to learning difficulty. In this way, because the unmarked lateral [l] and deleted

variant [Ø] are more different from the target feature /r/ in the L2, these two variants are thus predicted to be more frequently realised in comparison with the rhotics according to SLM.

There are existing studies supporting the MDH. For example, Benson (1986) explored Vietnamese ESL learners' acquisition of English voiceless and voiced consonant clusters. According to implicational universals, the presence of voiced obstruent clusters such as /-bz/ implies the presence of voiceless obstruent clusters such as /-ps/. In this sense, the MDH predicts that ESL learners will find more marked final voiced obstruent clusters more problematic than the less marked voiceless obstruent clusters in the same position. The speakers showed a preference for devoicing clusters, with the modification towards voicing the features not being adopted. The results found thus confirmed the MDH because the speakers had more difficulty in learning marked final voiced obstruent clusters than voiceless features. Eckman (1981a) investigated how the Cantonese and Japanese learners of English produce final voiceless and voiced obstruents. It was found that both groups of speakers had more difficulties in acquiring the voiced obstruents, which were relatively more marked, than the voiceless features, considered less marked. While the oral production of voiceless features was accurate, the speakers were likely to modify voiced sounds such as a schwa insertion after the final voiced obstruents among Japanese speakers as well as devoicing the voiced features among native speakers of Chinese.

On the other hand, the results in some previous studies went against the MDH. Cichocki *et al.* (1999) examined how Hong Kong Cantonese learners of French acquired voiceless and voiced consonants in initial and final positions. The findings showed that unmarked initial voiceless stops caused greater difficulties than marked initial voiced stops. The learners modified voiceless features into voiced features. For the French voiceless-unaspirated stops /p, t, k/, Cantonese learners showed higher rates of the oral production of voiced [b, d, g] than voiceless aspirated [ph, th, kh], followed by voiceless unaspirated [p, t, k]. In contrast, in the final position, the learners had more difficulties with voiced rather than voiceless stops. The authors suggested that these Hong Kong Cantonese learners of French were found to have difficulties with the unmarked voiceless stops due to the fact that they might not have established the phonetic categories that differentiate the native Cantonese /p-/ /ph/ from target French /p-/ /b/. In this way, the initial /b/ was produced at the rate of 100% accuracy. More importantly, the learners possibly adopted new phonetic realisation rules associated with interlanguage which were absent in L1 Chinese and were also not used by native speakers of French. Although it is the case that neither Lado's (1957) CAH nor Eckman's (1977) MDH are found to not completely explain all errors L2 speakers have in

learning L2, the MDH is nevertheless adopted because it incorporates insights from the CAH and the concept of universal markedness. The present study thus aims to offer another case study demonstrating whether or not the MDH is valid in predicting difficulties in the L2 acquisition of the prevocalic /r/ of Thai learners of English.

3.2.3 Markedness of /r/ and /l/ in both L1 and L2 acquisition

Although the primary focus of this chapter is L2 phonology, this section deals with the acquisition of /r/ and /l/ in both L1 and L2. As discussed in Chapter 1, /r/-/l/ merger prevocalically in Thai, in markedness perspective, possibly advances through the modification in favour of unmarked features. This is because the lateral [l] and deleted [Ø] variants are considered comparatively unmarked in comparison with the rhotics. The notion of markedness of the liquids in the present study will be based on the explanatory factors of child language acquisition, articulation, neutralisation, and statistical frequency which are summarised as follows.

3.2.3.1 Child language acquisition

Cross-linguistically, studies of children's phonological development show that the English /l/ is acquired earlier than the approximant [ɹ] rhotic (Pye *et al.* 1987; Ingram 1989: 364). The child language of Maya Quiche, in which /r/ and /l/ are allowed, shows the earlier acquisition of /l/ rather than /r/ (Pye, Ingram, and List 1987). Núñez-Cedeño's (2016) study of the acquisition of Spanish by twelve monolingual children showed that all of these speakers faced more difficulty in articulating /r/ than /l/ in an initial cluster. This in turn means that [obstruent + rhotic] clusters are realised either as [obstruent + lateral] or [obstruent + Ø], while there are no instances of children replacing [obstruent + lateral] with [obstruent + rhotic]. To put it simply, rhotics as initial cluster members can be replaced with the laterals, but not vice versa. Moreover, it was also confirmed by Barlow's (2003; 2005) investigation of four monolingual Spanish and bilingual Spanish-English speaking children that the tap [r] and trill [rr] are realised as the lateral [l].

3.2.3.2 Articulation

According to Gick *et al.* (2013: 212-213), lingual constrictions of /r/ and its variants are more complex than that of the articulation of /l/. That is, the articulation of /l/ requires less constriction of anterior medial bracing and wide lateral openings, while more lingual constrictions are needed for the production of some of the rhotic variants, such as English /r/ variants whose lingual constrictions require two lingual articulators, the tongue anterior and

the tongue root, together with a third constriction at the lips. Postvocally, it is also the case that the final /r/, as in ‘carr’, is usually deleted, particularly among dialects such as RP and other dialects of British English, while the postvocalic /l/, as in ‘heal’, is instead preserved. For native speakers of Thai learning L2 English, /r/ in the final position is more likely to be deleted, while the final /l/ is substituted with [n], [w], or [Ø] (Chunsuvimol 1996; Panlay 1997; Sumdangdej 2007). This is because, according to the phonotactics in L1 Thai, a final /l/ is not allowed, while [n], [w], or [Ø] can occur in the final position. It should be noted, however, that many varieties of English also have /l/-vocalisation, but this is not as advanced as /r/-vocalisation phonetically, phonologically, and sociolinguistically (Turton 2014). This thus suggests that articulatory production for the rhotic /r/ is more complex than that for the lateral /l/ both in initial and final positions.

3.2.3.3 Neutralisation

There appears to be a neutralisation of /r/ and /l/ to /l/ in some cases. According to Rice (2007), unmarked phonemes are usually the result of segment neutralisation because unmarked features or structures which are easier to produce are usually more resistant to linguistic change. According to Mayerthaler (1981: 4-5) and Faingold (2003: 3-8), the more marked segments are less resistant to sound change. Smith (1973: 13-22), who observed his son’s grammar in a longitudinal study, found that both liquids - [ɹ] and [l] - were neutralised to [l], but not to [ɹ]. In addition, previous studies (Beebe 1974; Beebe 1980; Treyakul 1986; Chunsuvimol 1993; Pulsup 1993; Phootirat 2012; Panyaatisin 2013; Pookkawes 2014) of prevocalic /r/ and /l/ in Thai confirm this claim suggesting that, in liquid neutralisation or the merger of /r/ and /l/ to /l/, the more marked rhotic /r/ is neutralised in favour of the unmarked lateral [l].

3.2.3.4 Statistical frequencies and implicational relationship

It is obvious that unmarked features or structures are more widely found cross-linguistically than the corresponding marked ones. A cross-linguistic typology of liquids was proposed by Maddieson (1984), who studied rhotic sounds in 282 languages. According to the phonological inventories of the UCLA Phonological Segment Inventory Database (UPSID), developed by Maddieson (1984, cited in Riney and Flege 1998: 221), 81.4% and 76% of the languages in the survey have at least one /l/ and /r/ respectively. The higher percentage of 81.4% shows that the segment /l/ is more frequent and thus less marked, while the lower percentage of 76% indicates that the segment /r/ occurs less frequently and is relatively more marked. Moreover, the lateral [l] is less marked than the approximant [ɹ] because, among

liquids, about 57% are laterals. The approximant [ɹ] represents 5.6% and the lateral [l] 42.6% of cases of inclusion in a languages' phonemic inventory. It was also reported that, among rhotic variants, the alveolar trill [r] is the most common or least marked rhotic (47.1%), followed by the flap or tap [ɾ] (38.3%), and the approximant [ɹ] the least common or most marked (13.5%). These percentages indicate that the unmarked liquids occur with a higher frequency than the relatively marked liquids. Thai may conform to this norm in the prevalent standard flap [ɾ] and trill [r] which are sometimes substituted with the lateral [l] or, in an initial cluster, /r/-cluster deletion [Ø].

In L1 Thai and L2 English, the database in relation to hierarchy of markedness of the prevocalic /r/ in the present study thus follows the frequency-based cross-linguistic typology suggested by Maddieson (1984), as explained above. The markedness hierarchy of the liquids is expressed on the following scale, where the most marked is at the left-hand edge:

approximant [ɹ] > flap [ɾ] > trill [r] > lateral [l]

For this reason, in initial cluster, the markedness hierarchy was:

Cɹ > Cɾ > Cr > Cl > CØ

It is worth mentioning that although the trill [r] is notorious for difficulties in articulation, the present study follows the frequency-based typology of Maddieson (1984), which suggests that the trill [r] occurs more frequently than other rhotics cross-linguistically. As the present study has already discussed, the rhotics in these two languages differ and, in terms of markedness, the English approximant [ɹ] is comparatively more marked than the rhotics in Thai - the flap [ɾ] and trill [r]. In the light of the transfer effect, native speakers of Thai are predicted to have difficulty in learning /r/ in English due to the differences of /r/ in L1 Thai and L2 English. Then, L2 learners might transfer and use their L1 features to aid learning the L2. This might then contribute to an explanation of the difficulty encountered in producing the English approximant [ɹ] rather than in producing laterals in L1 Thai and L2 English, which in fact are similar.

In addition to the transfer effect, markedness theory leads to the consideration that the merger of /r/ and /l/ in Thai occurs according to the modification towards unmarked phonemes. This is due to the fact that both [l] and /r/-cluster deletion [Ø] are comparatively less marked than the standard flap [ɾ] and trill [r]. While substitution of [l] for /r/ occurs in both initial and initial cluster positions, deletion [Ø] is realised only in initial cluster. For this reason, in initial cluster, the lateral [l], which was less marked than the rhotics, was more

marked than deletion [Ø]. In prevocalic position of both initial and initial cluster, lateral [l] and deletion [Ø] are associated, firstly, with the phonological process of /r/-/l/ merger in Thai and, secondly, with comparatively less marked variants than prevocalic rhotics. Because the prevocalic /r/ in the present study refers to /r/ in both initial and initial cluster positions together, these two variants are considered unmarked in comparison with the rhotics and are thus grouped together. This yields the markedness hierarchy, where the most marked is at the left-edge hand:

$$C_l > C_r > C_r > C_l, C\emptyset$$

It is thus hypothesised in the present study that the common variants adopted in L1 Thai are the non-standard [l] and /r/-cluster deletion [Ø], which are then more likely to be transferred to L2 English at higher rates than the standard Thai rhotics. This is because the unmarked features are less difficult and are thus acquired earlier than the marked features. According to the Markedness Differential Hypothesis (MDH), L2 Thai learners of English are expected have difficulty in acquiring the prevocalic /r/ in L2 English given that the English approximant [ɹ] is more marked than the rhotics in Thai - the standard flap [ɾ] and trill [r] as well as the non-standard lateral [l] and /r/-cluster deletion [Ø]. It is one aim of the present study to explore how an interaction of markedness and transfer shapes the interlanguage phonology in English production made by L2 Thai learners of English.

3.3 Theoretical principles of the quantitative paradigm

Because there are variants in Thai which are sociolinguistically conditioned (Beebe 1974; Beebe 1980; Treyakul 1986; Chunsuvimol 1993; Pulsup 1993; Phootirat 2012; Panyaatisin 2013; Pookkawes 2014), the issue of linguistic variation arises. According to Bayley (2002: 117), the quantitative paradigm pioneered by Labov in the 1960s and 1970s focuses on variationist research. In this sense, the frequency of occurrence of one variant over others occurring systematically rather than randomly, and constrained by internal and external predictors. These predictors reflect the underlying grammatical and social systems to which the speakers belong. With this approach, linguistic variability is an important aspect of a language. In the present study, Labov's quantitative paradigm is employed for the purpose of the variationist analysis. The research question 2) investigates how two linguistic and four extralinguistic factors influence /r/-/l/ merger in both L1 Thai and L2 English among ten native speakers of Thai. This is explored according to the principle of multiple causes (Young and Bayley 1996), suggesting that use of each particular variant is evoked by multiple factors. The results in terms of the variation of /r/-/l/ merger are subjected to mixed effects modelling.

The next section focuses attention on the role of markedness and transfer effects in L2 phonology as well as the major findings of previous studies relevant to the present study.

3.4 Influence of markedness and transfer on L2 phonology acquisition

It seems that English pronunciation is frequently in the spotlight of research in SLA. The difficulties experienced by L2 learners of English regarding the acquisition of English rhotic sounds have been widely reported in the literature. For instance, the acquisition of the English liquid phonemes by Japanese learners of English is of interest due to their difficulty in distinguishing the lateral and rhotic, suggesting the influence of their single L1 phoneme on the acquisition of the L2 (Goto 1971; Shimizu and Dantsuji 1987; Aoyama *et al.* 2004). Not only does Japanese have a single liquid, /r/, in its phonemic inventory, the /r/ varies between a lateral and rhotic because [ɹ] is an allophonic variant of /r/ and thus L2 learners perceive both English liquids of /r/ and /l/ as the single liquid /r/.

In a study by Dickerson (1975) investigating phonological variation in production among Japanese speakers of English, the target phonemes [ɹ] and [l] were pronounced differently depending on the phonological environment of the following vowel. In addition, stylistically, subjects produced more target-like variants when paying greater attention to their speech production, as in word-list reading, whereas less target-like production occurred in cases of unmonitored speech such as in conversational context. With respect to perception, Japanese listeners could not make the distinction between the English approximant [ɹ] and lateral [l] and regarded these liquids as similar to the Japanese apical-alveolar tap despite its similarity to [l] in certain environments (Guion *et al.* 2000). In the light of the Perceptual Assimilation Model-L2 (PAM-L2), developed by Best and Tyler (2007), L2 learners were more likely to encounter difficulty in discriminating non-native sound contrasts which shared similar articulators to those of their L1 features. In this sense, the PAM possibly explained why Japanese learners of English assimilated the English /r/ and /l/ to the Japanese apical-alveolar tap /r/.

Aoyama (*et al.* 2004) investigated how Japanese speakers, as L2 learners of English, perceived phonetic characteristics of the liquids for one year. It was found that Japanese /r/ was rather similar to English lateral [l] rather than to English approximant [ɹ]. For this reason, at the beginning stage of L2 English acquisition, the native speakers of Japanese were more successful in acquiring English [l] due to the similarities of Japanese /r/ and English [l]. After that, the L2 learners faced less difficulties in acquiring English [ɹ] because the differences or greater distance between Japanese /r/ and English [ɹ] prevented sound assimilation to occur.

In relation to the late stage of L2 English acquisition, the results probably suggested the impact of similarities of the features in the two languages which then resulted in learning difficulties. This might be associated with the SLM (Flege 1995) in that the similarities in the two languages related to difficulties, whereas the differences led to learning success. For this reason, it is worth mentioning here that the similarity should not be ignored because it might play a role in L2 learning as well.

The study of the acquisition of onsets and codas in consonant clusters by L2 learners is another common focus, especially within the framework of the markedness theory, which is discussed in Section 3.2.2 above. Osborne (2010) investigated how three Brazilian speakers of English produced rhotic sounds in free speech in relation to theoretical explanations, and found that Eckman's (1977) Markedness Differential Hypothesis (MDH) could account for the difficulty the speakers encountered with complex onsets and codas containing two and three members. Markedness, in addition, explains the difficulty these L2 learners faced in acquiring the most marked rhotic, the retroflex. However, this hypothesis cannot provide an explanation for all the complexities and asymmetries in the production of complex onsets and codas. Osborne's study revealed that the difficulty Brazilian speakers of English had in pronouncing the English rhotic sound related primarily to their perception of the phoneme and the linguistic environment in which the English rhotic occurs. In relation to Flege's (1995) SLM, although /r/ in the native and target languages, from the point of view of phonetics, is different, the speakers might judge English [ɹ] as phonologically equivalent to the Portuguese flap [ɾ]. As a result, the perception of similarities in /r/ in these two languages then caused learning difficulties.

Lovett (2009) examined the pronunciation of the English phonemes /l/ and /r/ in the initial and final positions in several syllable structures of nonsense words among nineteen native speakers of Korean. The frameworks considered were contrastive analysis and markedness. In Korean, allowable syllable structures were V, CV, VC, and CVC. As can be seen, Korean allows fewer syllable types than English. The Markedness Principle provided helpful insights into the difficulties that the L2 learners encountered in speech production. The more complicated syllable structures in English were difficult for these L2 Korean learners to acquire both /l/ and /r/ in those various syllable types. Lovett's application of markedness was supported because the subjects made errors of /l/ and /r/ in word-final position more frequently than in word-initial position. The errors were due to the phonological strategies the L2 learners employed to simplify some difficult words towards the unmarked syllable form, CV. Higher frequencies of errors were found in more complex

clusters, as in 'dree', 'skork', 'blem', and 'folge', than in simpler syllable structures, as in 'rop', 'gare', 'le', and 'voll'. The results were found to fit the hypothesis of the Markedness Principle, suggesting that the more complex the syllable was, the more difficult it would be. In addition, it was also reported that errors were more likely to be made in the more marked position of coda rather than in the onset which was less marked. The initial /l/ was least difficult, while the final /l/ was most frequently incorrectly pronounced, with the initial and final /r/ being somewhere in between. While the greater difficulty in producing the coda /l/ than the onset /l/ supported the markedness relation, the explanation for the speech production of the onset and coda /r/ was unclear. The suggestion was that further research with larger samples of participants might help to make this point clear. According to Lovett, factors such as age, gender, or English proficiency possibly influence speech production.

In addition to the study of the acquisition of English as an L2, the acquisition of rhotic sounds by English learners of other languages has also been investigated. Colantoni and Steele (2007) conducted a study of the acquisition of French rhotics and the production of the voiced uvular fricative /ʁ/ in the initial and final positions among 30 native speakers of English. It was found that the English speakers encountered difficulty in producing the voiced uvular fricative /ʁ/. The frication produced was comparable to that produced by native speakers of French, but the native-like voicing property was still problematic for the English learners. The explanation offered by Colantoni and Steele was that because in French rhotic frication is a more acoustically salient than a voicing property, these L2 English learners retained the features which were easier to perceive and discounted the less salient property of voicing. Moreover, it might be the case of L1 orthographic influence. It is possible that learners are simply reading the grapheme /r/ in French as its equivalent in L1 English.

Such studies have also revealed that English speakers of Spanish typically use the English [ɹ] instead of the Spanish alveolar trill [r] or tap [ɾ] (Major 1986; Elliot 1997; Face 2006). Face (2006) investigated the production of the rhotic contrast in the intervocalic position by 41 native speakers of American English learning L2 Spanish. The task considered was the short story reading. The standard Spanish rhotics are the tap [ɾ] and trill [r]. The errors made by these L2 learners included transfer errors occurring when the speakers transferred the L1 approximant [ɹ] rather than using the Spanish tap [ɾ] and trill [r]. Other errors were developmental where the features selected were not the L1 English approximant [ɹ] and the L2 Spanish tap [ɾ] and trill [r]. The rate of the accurate production of the Spanish tap [ɾ], which is similar to the American alveolar tap [ɾ], was higher than for the Spanish trill [r] in all contexts due to the positive transfer of the English tap which is an allophone of /t/

and /d/ and, in fact, is not associated with /r/. Advanced learners overgeneralised the tap [ɾ], which was thus incorrectly used in the position where the trill [r] should have been pronounced.

3.5 Influence of speech style on L2 acquisition

Relationship between variations and speech registers in SLA is another focus in a variety of studies. Dickerson and Dickerson (1977) investigated the influence of linguistic and stylistic factors on L1 transfer and the production of /r/ among Japanese learners of English. They found that these two factors played a crucial role in variation because the accurate production of /r/ was nearly 100% in a word-list task, while the rates of accuracy decreased to 50% in causal contexts. The study by Dickerson and Dickerson confirmed that variation is stylistically governed, with accurate oral production being more frequently produced in more formal contexts.

In the same way, Tarone (1983) assumed that, when acquiring the L2, increasing formality leads to greater accuracy or more native-like production, while vernacular styles result in less native-like sounds. Likewise, Schmidt (1987) investigated how L1 transfer and speech style play roles in the production of English /θ/, [θ] and [ð], by 34 native speakers of Arabic. It is worth noting that Modern Standard Arabic or Classical Arabic, used in formal situations, has interdental fricatives while colloquial Arabic does not. He used three reading tasks with different degrees of formality: the least formal was reading a passage, then reading a word list, and the most formal was reading a minimal pair. Schmidt found that the native-like [θ] and [ð] were produced more frequently in the more formal style. In terms of transfer, it is generally claimed that the influence of L1 transfer decreases in more formal speech due to an increasing attention paid to one's speech. With regard to L1 transfer in L2 learning, according to Major (2002: 73), when speakers monitor speech production more closely, transfer from L1 is prevented from occurring which then results in more accurate and target-like production. As can be seen, it was generally found that, firstly, the accurate or native-like pronunciation was found to be more frequent in more formal contexts such as minimal pair reading, with less native-like variants being used in informal contexts. Secondly, in learning L2, it was also the case that the features from L1 were less often transferred and employed in more formal contexts in L2. In this way, greater accuracy and more native-like sounds were more likely to be realised in formal contexts. In the light of the variation in the onset /r/ in Thai, it was generally found in Thai that, stylistically, the standard rhotics of Thai were expressed in formal contexts, with the non-standard variant of /r-/l/ merger being more

frequently heard in informal styles. To examine how stylistic variation in L1 plays a role in L2 learning, the following section explains oral production when native speakers of Thai are learning L2 English.

3.6 Production of liquids in L2 English by native speakers of Thai

Previous studies have investigated how Thai speakers acquire variations of /r/ and /l/ in L2 English (Beebe 1980; Senawong 1992; Chunsuvimol 1993; Seubsunk 1999; Phootirat 2012), but the results are sometimes inconsistent. As mentioned above, accurate or target-like features are usually adopted in more formal contexts (Labov 1966; Tarone 1983; Schmidt 1987); however, it is not always the case that increasing formality leads to more accurate and more target-like production in L2. This section presents the findings of the previous studies which investigated how L2 Thai learners of English produced the liquids. Their findings are described in the following paragraphs.

Beebe (1980) investigated the use of /r/ in both the initial and final positions by nine Thai learners of English, and found that the initial /r/ was produced in a more target-like way in casual speech rather than in formal settings. This is because the English [ɹ] was frequently replaced by the prestigious standard Thai trill [r] in more formal contexts. Beebe concluded that since the subjects paid more attention in more formal speech, the prestigious trill [r] which was usually used in formal contexts in L1 Thai was then stylistically transferred when learning the L2 English. In other words, the prestigious feature in L1 was triggered in more formal tasks rather than casual ones in the L2. The findings of Beebe's study thus suggested that stylistic transfer played a more vital role than did the preference for the unmarkedness.

Senawong (1992) examined how English words are nativised when borrowed into Thai in relation to sociolinguistic variables including occupational class, age, gender, and speech style. The sounds investigated were the initial clusters /bl, br, fl, fr, dr/. The participants were classified based on type of work into four occupational classes: professionals (class I), semi-professionals (class II), students (class III), and clerical/skilled workers (class IV). Three tests including English words commonly and frequently heard in Thai were adopted as an instrument in three different speech styles: casual speech, reading short phrases and sentences, and reading word lists. Senawong reported that initial clusters had three variants, including full clusters, reduced clusters, and substitute clusters. The full initial cluster conformed to the standard form of Thai initial clusters preservation regarded as the prestigious variant, while reduced clusters were associated with the deletion [Ø] of the second consonant /l/ or /r/ in initial clusters. The third variant was consonant substitution,

referring to an alternation between /l/ and /r/. In Senawong's study, the results revealed the less likely replacement of /r/ for /l/ at 0.10%, relative to that of /l/ for /r/ at 7.14%. Among the four groups of participants, full cluster retention occurred in class I (professionals) most frequently and class IV (clerical/skilled workers) least frequently, and vice versa in the case of cluster reduction. In all age groups, informants showed the highest rates of initial cluster retention, followed by cluster reduction. Females tended to use the standard features of initial cluster preservation more frequently than male speakers, who in turn were more likely to delete an initial cluster member than females. Speech style was not found to play a very crucial role in the variation. However, the speakers sometimes avoided prestige or standard variants because of their worries about straying from the vernacular.

In Chunsuvimol's (1993) study, mentioned in the previous chapter in Section 2.6, the English approximant [ɹ] was produced more often than other /r/ variants by hotel employees who were acquiring L2 English. Similar to the results when the participants produced /r/ in L1 Thai, the females, speakers in higher status positions at work, and subjects with a background of more English experience were more likely to use the standard English [ɹ] than the counterparts. In general, the L1 Thai variants were used approximately half as often as the English approximant [ɹ]. In both initial and initial cluster positions, [ɹ] was adopted at the highest rate, while [l] and [Ø] were selected as the second most preferred variants in the initial and initial cluster positions respectively. The results thus did not follow the prediction of markedness because the speakers used the more marked approximant [ɹ] more often than the unmarked variants.

Seubsunk (1999) explored the relationship between L1 Thai dialects and L2 English pronunciation of stop-liquid and stop-glide clusters in initial cluster position. Seubsunk aimed to investigate how L1 dialect effect and two theoretical models - the Language Transfer and the MDH - played a role in L2 acquisition. The participants were thirteen speakers from two dialects including six and seven speakers from each dialect. The differences between these two dialects were that speakers from one dialect maintained the liquid clusters, while those from the other dialect preferred to omit the liquids as a cluster member. The tasks used to elicit the data were picture description, sentence reading, and word-list reading. Seubsunk found that phonotactic features in L1 Thai is transferred to L2 English. Cluster deletion [Ø] was found in speakers whose stop-liquid clusters are not allowed in L1 dialect. On the contrary, L2 learners from L1 dialect with permitted stop-liquid clusters had less difficulty in acquiring stop-liquid clusters in L2 English and were thus likely to preserve the cluster consonant when acquiring L2. Seubsunk suggested that L1 dialect had an impact on speech

production in L2. In relation to the theoretical perspectives, the Language Transfer theory was able to explain the errors subjects made in learning L2 English better than the MDH. It was found that speakers from the L1 dialect that usually delete the liquid cluster were more likely to delete the liquid in stop-liquid clusters in L2 English, as in ‘bessing’ for ‘blessing’. On the other hand, speakers from dialects whose L1 dialect retained stop-liquid clusters were successful in learning these clusters in English.

Phootirat (2012) investigated whether the stylistic variation of the /r/-/l/ contrast in Thai is transferred to American English in syllable-initial singletons, syllable-initial clusters, and syllable-final singletons. Data was collected from 25 Thai ESL learners producing /r/ and /l/ in four tasks representing four different speech styles of interviews, naming pictures, reading passages, and reading word lists. The approach was based on the transfer hypothesis concerning sociolinguistic variation which suggests that sociolinguistic factors that constrain speech production in the L1 play a role in interlanguage as well. The sociolinguistic constraint considered in Phootirat’s study was speech register. The author found that production of the /r/-/l/ in Thai and English differed, which apparently did not support the transfer hypothesis of sociolinguistic variation. Extralinguistic factor of speech register that played a role in the L1 Thai did not affect the distribution of /r/ and /l/ in English. That is, speech production in the L2 was indicative of learning development in the sense that, when learning English, the target-like liquids were predominantly realised across all tasks. As a result, the findings went against the predictions of markedness.

The next section explains research questions addressed in the present study.

3.7 Research questions

The existing literature discussed in the previous and in this chapters shows that variation in the production of prevocalic /r/ among native speakers of Thai is likely to be constrained by extralinguistic factors such as speech style, age, gender, educational level, or profession. As can be seen, there were no studies which explored the speech production of /r/ on the basis of markedness perspective. The present study thus aims to fill a gap in knowledge by, firstly, examining how an interaction of the markedness and transfer explains learning difficulty of the prevocalic /r/ in L2 English and, secondly, by investigating the effect of two additional linguistic factors of syllable stress and preceding sound as independent variables that may potentially influence the choice of a variant in both L1 Thai and L2 English.

In acquiring the prevocalic /r/ in L2 English, it should be noted again that the rhotics

in Thai and English differ. For native speakers of Thai, learning /r/ in L2 might be problematic because the rhotics in L1 are relatively less marked than the approximant [ɹ] in the L2. As discussed above in Section 3.2.2, markedness can predict the transfer, suggesting that if L1 features or structures are less marked than those in the L2, transfer will occur. On the other hand, transfer will not take place when features or structures in the L1 are more marked. At the segmental level, Thai speakers of L2 English are thus predicted to face such challenges as transfer of either the flap [ɾ] and trill [r] or lateral [l] and /r/-cluster deletion [Ø] which are comparatively less marked than the English approximant [ɹ] from the L1 Thai to the L2 English. For this reason, this suggests a solid reason for the present study continuing to examine how markedness and transfer interact in L2 phonology acquisition. Due to the combination of markedness and transfer into the Markedness Differential Hypothesis (MDH) proposed by Eckman (1977), the present study investigates whether or not the MDH, firstly, can provide explanations and predictions for the difficulties native speakers of Thai face when acquiring the prevocalic /r/ in L2 English. Secondly, examining the MDH, the present thesis explores if the patterns of acquisition and the difficulties correspond to the markedness relations between L1 and L2. Thirdly, the present study aims to investigate which features are more likely to be transferred to L2 English according to the MDH.

In addition to an interaction of markedness and transfer, the present study adopts Young and Bayley's (1996) principle of multiple causes to explore the multiple factors influencing the choice of the prevocalic /r/ variant of either the distinction or merger of /r/ and /l/. As well as the extralinguistic factors that constrain the prevocalic /r/ variants among Thai speakers as reported in the existing literature, the present study also examines the two linguistic factors of syllable stress and phonetic context preceding the segment in question which might affect the acquisition of the learners' L1 and L2 phonology. The prediction in terms of syllable stress is made according to the study of /-t, -d/ deletion, which was found to be more frequent in unstressed rather than stressed syllable, as can be seen in Section 2.4.1. With regard to preceding context, as described in Section 2.4.2, the final /-t, -d/ deletion was more often related to a preceding consonant than a preceding vowel (Labov 1989). In the investigation by Baranowski and Turton (2015), it was found that H-dropping was less likely to occur with a pause than a preceding vowel or consonant. As a result, the present study follows these previous studies in relation to these two linguistic factors.

The present study sets out to answer the following four research questions:

1) Does the Markedness Differential Hypothesis (MDH) predict the L2 Thai learners' difficulties in acquiring the prevocalic /r/ in L2 English?

1.1) Do the patterns of the L2 acquisition and the difficulties associated with certain forms correspond to the markedness relations between L1 and L2?

1.2) Which linguistic variants tend to be transferred to L2 English more frequently, marked standard rhotics or unmarked non-standard variants?

2) How do linguistic (syllable stress and preceding sound) and extralinguistic (age group, gender, speech style, and IELTS speaking score) factors affect the choice of production of one realisation over other alternatives in L1 Thai and L2 English?

In relation to the theoretical aims of the present study, the first three research questions examine the role of the interaction of markedness and transfer in the acquisition of the prevocalic /r/ in L2 English in the light of the MDH. The realisations of the prevocalic /r/ in L2 English answer these three research questions.

A variationist analysis, in terms of factors influencing the merger of /r/ and /l/, supplements the predictions in the present study. To answer the research question 2), the production of the prevocalic /r/ in both L1 Thai and L2 English by native speakers of Thai is analysed.

3.8 Summary

Researchers have found in previous studies that both markedness and transfer play roles in L2 acquisition. The present study aims to investigate how the markedness and transfer effects influence L2 phonology acquisition of the prevocalic /r/ among Thai learners of English. When non-native speakers acquire sounds in L2 which are more marked than and absent in the L1, the L2 learners show a preference towards unmarked features. Native speakers of Thai sometimes also follow this trend by using the prevocalic /r/ variants in L1 Thai which are relatively less marked when acquiring the prevocalic /r/ in L2 English. Not only the standard rhotics, but also the non-standard features of lateral [l] and /r/-cluster deletion [Ø] are employed in positions where the English approximant [ɹ] is required. In terms of the multiple factors that may influence sound variation, studies discussed confirm that the choice of a particular variant is regulated by both linguistic and extralinguistic predictors. However, the findings from previous research into the prevocalic /r/ in both L1, discussed in the previous chapter, and L2 by native speakers of Thai have not taken linguistic factors into consideration.

Apart from extralinguistic factors that constrain the prevocalic /r/ variants among Thai speakers as reported in the existing literature, the present study fills a gap in knowledge by taking two linguistic factors into account. It thus investigates the relationship between phonological variation and multiple factors, including two linguistic factors of syllable stress and preceding sound; and four extralinguistic factors of age, gender, speech style, and proficiency as based on IELTS speaking score, which might shape the variation in the prevocalic /r/ in L1 Thai and L2 English. It is thus predicted in the present study that the merger of /r/ and /l/ will be more frequently found within unstressed syllables, after a preceding consonant, in speakers aged in their 20s, in male speakers, in the informal context of picture naming, and by L2 learners with IELTS speaking scores of 5s in both L1 Thai and, due to the transfer effect, L2 English. In the next chapter, the methodology of the study is explained.

Chapter 4. Methodology

4.1 Introduction

The major goal of the present study is to explain the difficulties L2 Thai learners of English encounter when acquiring the prevocalic /r/ from the perspectives of markedness and transfer. The Eckman's (1977) Markedness Differential Hypothesis (MDH) is required because both L1-L2 differences and language universals can be employed to explain L2 acquirers' difficulties. The present study explores the sound production of ten native speakers of Thai encompassing three subdisciplines of linguistics, i.e. phonetics, phonology, and sociolinguistics. The findings will provide a more complete understanding of the role of markedness and transfer in L2 acquisition as well as the situation of the /r-/l/ merger. Merger involves the loss of the phonemic contrast between /r/ and /l/ prevocalically in L1 Thai. It is the case in Thai that these two phonemes, /r/ and /l/, may both be realised as [l], or the deletion of either /r/ or /l/ as a cluster member may occur. This chapter provides a detailed description of the methodology designed to collect data for both qualitative and quantitative analyses.

4.2 Methodology

4.2.1 Participants

The present study of apparent phonological variation is based on both theoretical and empirical objectives. Theoretically, it aims to provide an integrated account of markedness and transfer. Its empirical aim is to study the variability in the prevocalic /r/ elicited in four different speech styles following Labov's model of stylistic variation. Speech data are gathered from ten native speakers of Thai living in Newcastle upon Tyne, the largest city in the North East of England. In terms of the empirical approach to be used, the relationship between internal and external factors is determined in investigating how these predictors constrain the characteristic features of /r-/l/ merger in both L1 Thai and L2 English. Each speaker reads a total of 235 target words, including 114 in Thai and 121 in English resulting in 2350 tokens overall. The number of tokens in each task is shown in Table 4.2 below.

In the present study, a variationist approach is used to identify trends among ten Thai speakers. For this reason, the sample size was not large enough to draw any sociolinguistic conclusions because the main aim of the thesis is not sociolinguistic or variationist. It in fact primarily focuses on linguistic factors of L2 phonology acquisition. However, the limiting

factor is the small number of native speakers of Thai, who have IELTS qualification, living in Newcastle upon Tyne, UK. Although the number of subjects is not large, this could be justified because the large volume of tokens considered can provide adequate data for statistical analysis which can compensate for the small number of informants. According to Guy (1980), 30 tokens per variable for each subject can offer representative and reliable samples in variationist research; however, the minimum of ten tokens is a reasonable objective given that the observed variation reflects the systematic pattern found in the participants rather than random fluctuation. In the present study, the minimum of ten tokens per informant is aimed for in each factor group. Nevertheless, the minimum of ten tokens cannot be reached in some factor groups, such as the preceding vowel for the factor of preceding sound, due to the limited number of tokens in this environment. The number of informants in the present study, however, is similar to that in Beebe's (1980) study of the use of the initial and final /r/, whose participants were nine native speakers of Thai staying in New York, USA.

The participants were recruited taking into account age, gender, and proficiency as based on IELTS speaking score because these three predictor variables are well-known contributory factors to variation according to the existing literature (Beebe 1974; Senawong 1992; Chunsuvimol 1993; Pookkawes 2014). The participants in the present study were students with and without working experience. The friend-of-a-friend method for contacts was adopted, and among these subjects, the length of stay in England is comparable. As can be seen from Table 4.1 below, the ages and IELTS speaking scores of the participants were fairly similar. These ten informants were then divided into two groups aged in their 20s and 30s+. In relation to gender, the total of ten speakers comprise five males and five females. The proficiency as based on IELTS speaking scores of subjects ranging from 5.5 to 6.5 were also divided into groups of the 5s and 6s. As far as the proficiency as based on IELTS speaking score is concerned, Thai teachers teaching English were excluded from the present study, due to their speech production having been conditioned by their English proficiency and experience in English pronunciation. According to Chunsuvimol (1993) and Phootirat (2012), the approximant [ɹ] occurs in the speech of native speakers of Thai with higher English proficiency, especially those whose work is associated with an English-speaking setting.

Participant	Gender	Age (years)		IELTS speaking score	
		20s	30s+	5s	6s
Participant M	Female	22			6.5
Participant TP		25			6
Participant F		27		5.5	
Participant PK			34		6
Participant PP			36	5.5	
Participant J	Male	20			6
Participant N		24		5.5	
Participant PC			34	5.5	
Participant PA			35		6
Participant PJ			42	5.5	

Table 4.1: Participants according to gender, age, and IELTS speaking score

4.2.2 Stimuli

A total of 2350 target words with the prevocalic /r/ were chosen. These words occurred at approximately the same rates in the two languages, at 1140 and 1210 respectively in L1 Thai and L2 English, with almost all of the words occurring only once across the four tasks. Inevitably, however, some words occurred repeatedly. For example, the word /prà.p^hē.nī:/ ‘tradition’ occurred four times in the passage reading in L1 Thai. Having an approximately equal number of tokens in L1 and L2 should prevent the use of the L1 or L2 playing a significant role in affecting the results. In this way, other predictors regarded as independent variables can be compared more straightforwardly.

The variation in use of a particular phoneme produced differently by the speakers may depend on multiple internal and external factors, but it is beyond the scope of the present study to include all possible predictor variables. In the present study, six separate independent variables are regarded as factors consisting of a total of fifteen groups, as shown in Table 4.2 below, in which the numbers of tokens involved are also provided. Each of these factors is

based on theoretical and empirical evidence from existing work previously explained in Chapter 2 and 3. It should be noted that although the stress patterns in L1 Thai and L2 English are different, the factor of syllable stress used in the present study focuses on the tonal and stress system of L1 Thai. That is, only the monosyllabic content words and the final syllables of polysyllabic words are considered to bear stress in Thai. For example, the stressed syllable of ‘rabbit’ for native speakers of Thai is the final syllable rather than the first syllable according to the stress pattern in L2 English.

Factors	Categorical variables	Factor levels	Number of tokens	
			L1 Thai	L2 English
Linguistic	1. Syllable stress	1.1 Stressed syllable	740	860
		1.2 Unstressed syllable	400	350
	2. Preceding sound	2.1 Preceding pause	330	460
		2.2 Preceding vowel	70	150
		2.3 Preceding consonant	740	600
Extralinguistic	3. Age group	3.1 20s	570	605
		3.2 30s+	570	605
	4. Gender	4.1 Female	570	605
		4.1 Male	570	605
	5. Speech style	5.1 Naming a picture (NP)	60	60
		5.2 Reading a passage (RP)	280	350
		5.3 Reading a word-list (WL)	400	400
		5.4 Reading a minimal pair (MP)	400	400
	6. IELTS speaking score	6.1 5s	570	605
		6.2 6s	570	605

Table 4.2: Independent variables according to factor and factor group

Because the prevocalic /r/ varies stylistically in Thai, the methodology is designed so that the data is collected in a range of situations with different degrees of speech formality. According to Labov’s (1966, 2001) attention-paid-to-speech model, the degree of formality is related to a speaker’s attention to speech, which could be reflected in the linguistic variant selected by speakers. This model focuses on two possibilities indicating that, firstly, the

speakers' speech is determined according to how much attention the speakers pay to their speech production and, secondly, the attention paid to speech is influenced by the degree of formality of the situation. In other words, a higher degree of formality corresponds to increased attention to speech, which then would be more likely to yield the standard variant. For this reason, the database in the present study is elicited from four types of speech styles ranging in different degrees of formality, with the least formal task shown below on the left (Amara 1999: 124):

picture naming > passage reading > word-list reading > minimal pair reading

The use of these four tasks aims to allow the observation of style shifting in which the informants pay the least to the greatest amounts of attention to speech. Passage reading, as in 'vary', is regarded as being more formal than picture naming, as in 'rose', due to the fact that literacy is required to elicit data from the passage-reading task, whereas there is no the influence of orthography in picture naming. The picture-naming task without orthographic monitoring requires a small amount of aware self-monitoring and thus already represents more natural speech and the most spontaneous style. The word-list-reading task, as in 'really', involves a higher degree of formality and attention than the previous two tasks, while the style for minimal pair reading is considered to be the most formal, leading to the most self-conscious speech because of the phonological contrast in each pair of items, as in 'mode - road'. The informal style of an interview is not employed in the present study in order to ensure that all of the same target words are analysed across subjects. In choosing the tokens for elicitation in the picture-naming task, all words are monosyllabic and have liquids which are either /r/ or /l/ in the onset position. For the passage-reading task, the target words can be either monosyllabic or polysyllabic words. With regard to the word-list-reading task, all words are bisyllabic words. In this task, the target words have an onset /r/ preceding either an onset /r/, as in 'rerun' and 'breakthrough', or an onset /l/ as in 'really' and 'dry-clean'. In the same way, the onset /l/ can precede either an onset /r/, as in 'lurid' and 'playground', or an onset /l/ as in 'lovely' or 'flip-flop'. The words in the minimal-pair-reading task are only monosyllabic words. In this task, there are three types of minimal pair words, including an onset /r/ with a non-target sound, as in 'mode - road', /r/ and /r/, as in 'room - root', as well as the target sound of /l/, as in 'lay - ray'. These three types of pairs are designed to divert the speakers' attention from the target words in order to reduce the possibly monitored oral production. The full list of words containing the stimuli in L1 Thai and L2 English is presented in Appendix A and Appendix B respectively.

All tasks were designed to avoid the monitored production of /r/ by including the target words amongst filler words. Each of the tokens in the word-list and minimal pair reading is presented to the participants five times, by having the subjects read each list five separate times, in order to increase the number of tokens, to avoid contrasting accents, and to make the conclusions drawn from the analysis more statistically robust. These two tasks are repeated because the tokens in these two tasks naturally involve greater stimulus and attention, and, in addition, the target words are amongst a more limited number of fillers than those in the passage-reading task. Moreover, this is the way to observe the speech production of an individual subject investigating whether production is the same in five times. In the less self-conscious tasks of picture naming and passage reading, each variable is presented on the screen only once because the subjects might not be closely monitoring speech production.

The procedure of data collecting is explained in the next section.

4.2.3 Procedure

Recordings were carried out in quiet settings such as the informants' home or the university language lounge. Before a recording session took place, the respondents were asked to read the description sheet and sign consent forms written in English. With regard to the ethical aspects of the research, the subjects were informed to feel free to withdraw from participation at any time and were informed that the data would be digitally audio-recorded and anonymised. Instructions about using the computer and recording equipment during the recording session were also given. To minimise the formality of the session and to reduce the informants' awareness of being observed, the subjects were sitting in the room while being recorded whereas the researcher sat in the corner to leave the subjects enough personal space. A total of 235 tokens, together with the fillers, for each participant were presented on a Power Point slide during the recording session. The equipment used for sound recording was a Sony ICD-UX560F. The sequence of those four tasks was ordered from least to most formal task as follows: picture naming, passage reading, word-list reading, and minimal-pair reading. When the subjects had finished reading these four tasks in Thai, the same task order in English was then performed. When the participants unexpectedly pronounced the same words more than once, only the first utterance was taken into consideration because this was considered more natural speech production. Finally, the structured tasks were followed by a debriefing session together with the administration of a questionnaire asking for general information about the participants.

4.3 Data Analysis

4.3.1 Transcription

Speech data from the ten informants were recorded and then analysed auditorily and acoustically using the speech analysis system Praat (Boersma and Weenink 2015). The general point here is that acoustic measurement helps to ensure an accurate auditory analysis, since the speech signals of consonantal features are analysed more thoroughly and precisely with an acoustic method rather than listening alone. The visual representation of sound spectrograms is demonstrated in Section 6.3 of Chapter 6. The qualitative speech analysis of phonetic symbols is therefore typically transformed into quantitative measures. The quantitative evidence is then presented in forms of proportions and percentages.

The recorded sounds of the speakers' pronunciation were assessed by the researcher and two other listeners, who were linguists and native speakers of Thai. These three assessors have phonetics and phonology background knowledge and training in the use of Praat software. The advantage of conducting analysis by multiple coders for the same data is to increase the reliability of findings. All of these three listeners separately analysed the transcriptions. While the other two listeners listen to speech production only once, due to time constraints, the recordings were listened to and analysed three times by the present researcher during separate listening sessions to check the consistency of the results. To try to ensure, as far as possible, the reliability and validity of the analysis, after listening to the sound for the first time, a period of two weeks was allowed to pass before the second analysis. A period of a further two weeks was also allowed to pass again before repeating the process of the third analysis. This two-week break was designed in order to refresh the researcher's ears. Furthermore, the researcher was unaware of the previous findings when the second and third analysis were conducted. This was a further attempt to ensure accuracy by removing any bias occurring as a result of knowledge of the previous results. For the researcher, when the same result was found at least two times out of three, this was taken to be the definitive result. The same method was adopted when the judgment was that of three separate listeners. In this way, when two of three results are in agreement, this result is taken as definitive. The judgements of the transcriptions of these three listeners were expected to ensure that the results were analysed and considered with due caution. If no agreement could be reached between the three assessors, then the plan was to refer the matter to a fourth listener, a trained linguist. In fact, this proved to be necessary on some occasions. This is because transcription might be quite challenging due to phonetic similarities. For example, the flap [ɾ] and approximant [ɹ]

may be auditorily similar, especially in an initial cluster, as in ‘draw’ and ‘through’. Spectrographic analysis was thus used to determine some of the complex cases where a token could be either the flap [ɾ] or approximant [ɹ].

The data was then transcribed into IPA (the International Phonetic Alphabet) and the judgments of the variants heard were coded as approximant [ɹ], flap [ɾ], trill [r], lateral [l], deletion [Ø], or other possible variants. It is beyond the scope of the present study to include all feasible variants of rhotics, so only the major distinct forms are considered. The variability of the prevocalic /r/ could involve manner rather than merely the place of articulation and contrasts in voicing, so places of articulation and the voicing properties of the features are not analysed in the present study. For instance, although trills are typically governed either by an acoustic or articulation definition, the general and straightforward term ‘trill’ in the present study is considered to refer only to the rhotic trill [r] consisting of two to five periods (Ladefoged and Maddieson 1996: 218). The categories of coding are based on the primary goals of the present thesis in investigating how the prevocalic /r/ is realised in L2 English in terms of phonemic transcriptions.

4.3.2 Quantitative analysis

The quantitative analysis determines the frequency of particular occurrences of each variant which are typically presented as percentages. The variants regarded as dependent variables are then grouped along the continuum of variation in response to each of the research questions. The research questions 1) and 1.1) explore whether the Markedness Differential Hypothesis (MDH) can provide explanations and predictions for the difficulties native speakers of Thai have when acquiring the prevocalic /r/ in L2 English. As a result, dependent variables in relation to these two research questions include the general realisations of the prevocalic /r/, namely the approximant [ɹ], flap [ɾ], trill [r], lateral [l], deletion [Ø], or other feasible variants. These five major variants are then grouped to appropriately answer the research questions 1.2) and 2).

The research question 1.2) answers the question of which linguistic variants tend to be transferred to L2 English more frequently: marked standard rhotics or unmarked non-standard variants. This investigates how the interaction of markedness and transfer plays a role in L2 English production. Although both markedness and transfer interact to shape interlanguage phonology, it is an aim of the research question 1.2) to find out which effect dominates. For this reason, the variants selected should be either marked or unmarked sounds based on the standard features allowed in each language, L1 Thai and L2 English. This is because the

standard rhotics used in Thai and English differ. In Thai, the rhotics can be realised as either the flap [ɾ] and trill [r] or the lateral [l] and /r/-cluster deletion [Ø]. To tease apart what is motivated by markedness constraints as opposed to L1 transfer, the results could support the hypothesis of phonological transfer from the L1 when the informants predominantly exhibit the standard Thai flap [ɾ] and trill [r] which are relatively more marked than the non-standard lateral [l] and deletion [Ø]. In contrast, markedness would override transfer if the modification in favour of the unmarked lateral [l] and /r/-cluster deletion [Ø] variants does occur in L2 English more frequently. It should be noted again that the lateral [l] and deleted [Ø] variants are grouped together because either [l] or /r/-cluster deletion [Ø] is regarded as /r-/l/ merger in Thai according to Phootirat (2012: 132). In the same way, [l] and /r/-cluster deletion [Ø] are comparatively less marked than the rhotics. In addition, to appropriately answer the research question 2), the binary variant is required for a mixed effects logistic regression. Then, the realisation as rhotics is considered to be /r-/l/ distinction, with the production as [l] or /r/-cluster deletion [Ø] being associated with /r-/l/ merger. Otherwise, the L2 acquisition development takes place due to the predominant use of the English approximant [ɹ]. The list of possible results in relation to the most frequent realisation is summarised as follows:

- | | |
|---------------------------------------|------------------------------|
| Marked approximant [ɹ] | → L2 acquisition development |
| Marked flap [ɾ] and trill [r] | → L1 negative transfer |
| Unmarked lateral [l] and deletion [Ø] | → unmarked preference |

The research question 2) focuses attention on the effect of influencing factors on the choice of a variant in both L1 Thai and L2 English. In this sense, independent variables correspond to two linguistic predictors, including syllable stress and preceding sound, along with four extralinguistic factors of age group, gender, speech style, and proficiency as based on IELTS speaking score. The research question 2) explores how multiple factors influence the choice of variants observed in L1 Thai and L2 English, and so the variants lie along a single dimension from either /r-/l/ distinction or /r-/l/ merger. In this respect, regardless of standard status of prevocalic /r/ in each language, /r-/l/ distinction, which includes the realisations of /r/ as the approximant [ɹ], the flap [ɾ], and the trill [r], is associated with standard realisation in both L1 Thai and L2 English. This is because the contrast of /r/ and /l/ is maintained. In contrast, /r-/l/ merger involving the substitution of [l] and /r/-cluster deletion for prevocalic /r/ is related to non-standard variant because of the loss of /r-/l/ contrast.

As can be seen, while the number of variants of a range lie along a continuum of five realisations for the research questions 1) and 1.1) together with three realisations for the research question 1.2), the binary choice between distinction and merger is used in coding the variants for the research question 2). Table 4.3 shows the categories of variants according to the four research questions.

Variants (research questions 1) and 1.1))	Marked/ unmarked variants (research question 1.2))	Distinction/ merger (research question 2))
Approximant [ɹ]	Marked approximant [ɹ]	/r/-/l/ distinction
Flap [ɾ]	Marked flap [ɾ] and trill [r]	
Trill [r]		
Lateral [l]	Unmarked lateral [l] and deletion [Ø]	/r/-/l/ merger
Deletion [Ø]		

Table 4.3: Boundaries of the prevocalic /r/ variants according to research questions

The next section deals primarily with statistical analysis, which is used to answer the research question 2).

4.3.3 Statistical analysis

Statistical analysis is adopted to answer only the research question 2). In relation to the quantitative paradigm used, the frequency of occurrence of the variant compared to others is systematically rather than randomly constrained by multiple predictors. The frequency of each variant is analysed according to both linguistic and extralinguistic factors using a statistics software program, the R (R Core Team 2017), which is used to carry out the generalised mixed effects logistic regression for categorical variables. Random effects are included in the model because word-level and speaker-level variation are considered linguistic and extralinguistic factors respectively. It is worth noting that the same speakers may behave consistently across contexts, whereas the different individuals are more likely to exhibit different features. Unless a predictor for individual words and speakers is present, the differing behaviours in speech production of the words and speakers which might affect sound production are ignored. The regression analysis will show which predictor variables are related to the distinction or merger of /r/ and /l/ cited as a dependent or response variable which is a categorical or binary variable. For this reason, the *glmer()* command of the R lme4

package (Bates and Maechler 2009) is employed in the present study. Variation in terms of individual words and speakers as random effects and all fixed effects are thus analysed at once, rather than examining each factor individually. After leaving out insignificant predictors, the best model is adopted which shows how many predictors are significant and so are included in the model of best fit. This determines the significance of each factor according to the relationship with the merger of /r/ and /l/ within a significance cut-off of 0.05.

Overall distribution of the prevocalic /r/ by speakers is also analysed by conditional inference trees with the software package ‘ctree’ (Hothorn *et al.* 2015), which then divide the speakers into groups or nodes according to a predominant particular variant of individual speakers. That is, in conditional inference trees, each node reflects the prevocalic /r/ variants the speakers pronounce predominantly. The association between the speakers and the selected variants is measured by a p-value. The speakers are grouped into separate node when a p-value is smaller than 0.05.

4.4 Summary

This chapter provides a detailed description of the methodology used to collect data. Data was collected from ten native speakers of Thai pronouncing the prevocalic /r/ in four tasks representing four different degrees of formality. A total of 114 and 121 items in L1 Thai and L2 English respectively were coded for each participant with auditory and acoustic measurement. The results are based on the judgements of three listeners. The transcriptions are distinguished along the continuum of variation according to the research questions, including five-, three-, and two-dimensions respectively for the research questions 1) and 1.1), 1.2), and 2). Statistical analysis, as determined by the generalised mixed effects logistic regression, is employed to answer the research question 2) investigating the factors shaping the variation of /r-/l/ distinction or merger in L1 Thai and L2 English. The predictors which reach statistical significance are then included in a model of best fit. The next chapter, Chapter 5, presents the detailed results of the analysis and interpretation of the variants observed in L1 Thai.

Chapter 5. Results and Interpretation

Quantitative Analysis of Variation: Thai

5.1 Introduction

Although the primary aim of the present study is the L2 acquisition of prevocalic /r/, analysing speech production in L1 Thai completes the picture by showing the situation of /r-/l/ merger in Thai. Moreover, Thai production can show how the effect of markedness plays role in the L1 acquisition. The results will also compare how native speakers of Thai acquire the prevocalic /r/ in both languages. In addition, this section addresses the research question 2) concerning how a wide range of linguistic (syllable stress and preceding sound) and extralinguistic (age, gender, speech style, and IELTS speaking score) factors affect the choice of production in L1 Thai. This is explored according to the principle of multiple causes (Young and Bayley 1996), which suggests that each particular variant is regulated by multiple factors. The influence of each of the six separate factors regarded as independent variables on sound variation in the present study is theoretically and empirically supported by the previous research. In terms of the quantitative paradigm, the statistical relationship between these six predictor variables and the response variable is analysed. The R statistics software (R Core Team 2017) is used to perform mixed effects regression analysis, which also takes the variation in terms of individual speakers and words as random effects into account.

The findings in this chapter are reported in three main sections. In the first part, the general findings concerning the features found according to individual speakers are described. Secondly, the statistical significance of the model of best fit is analysed to determine the effects of multiple independent variables on a categorical dependent variable or the binary variant. The third section illustrates the proportion of the distribution of each variant in relation to individual sources of variation to illustrate how these six factors affect the variants. The speech production found is reported in the form of a table of percentages followed by graphical representation, which is displayed to supplement those percentage data.

5.2 Overall distribution of the prevocalic /r/ by speakers

Before taking into account how linguistic and extralinguistic factors affected the use of /r-/l/ merger in L1 Thai, this section describes the general findings concerning the features found according to individual speakers. Variation between speakers is then statistically analysed. The subjects are split into groups or nodes according to their speech production. Each node reflects the prevocalic /r/ variants the speakers pronounce predominantly in L1 Thai. From the

findings, the respondents are classified into groups or nodes, as can be seen in Figure 5.1 below. At the top level 1, speakers were categorised into two major groups according to the selected variant. The first category on left branch 2 is comprised of speakers F, N, PA, PC, PJ, PK, and TP together with another group of speaker J, M, and PP on right branch 15 as the predominant users of the prestigious standard trill [r]. The next division of left branch 2 was made according to speakers F, PJ, PK, and TP as lateral [l] users as well as another group of N, PA, and PC who were speakers of the standard flap [ɾ]. For this reason, there exist three groups of speakers depending on the chosen variants: users of the lateral [l], flap [ɾ], and trill [r]. The data has finally been divided up into nine classes, including nodes labelled 6, 7, 8, 9, 11, 13, 14, 16, and 17, wherein the p-value for each class suggests statistical significance. This shows that the speech production features among the speakers in each node significantly differed. Speakers J and PP were in a single node 16 due to the similar features employed. For this reason, the standard variants belong to nodes 11, 13, and 14, referred to as the standard flap [ɾ] speakers, and node 16 and 17 are regarded as prestigious standard trill [r] users. The left-most and right-most nodes thus showed an extreme contrast in the production of speakers F and M who were very close respectively to categorical speakers of the non-standard lateral [l] and the prestigious standard [r] in the prevocalic /r/ in L1 Thai.

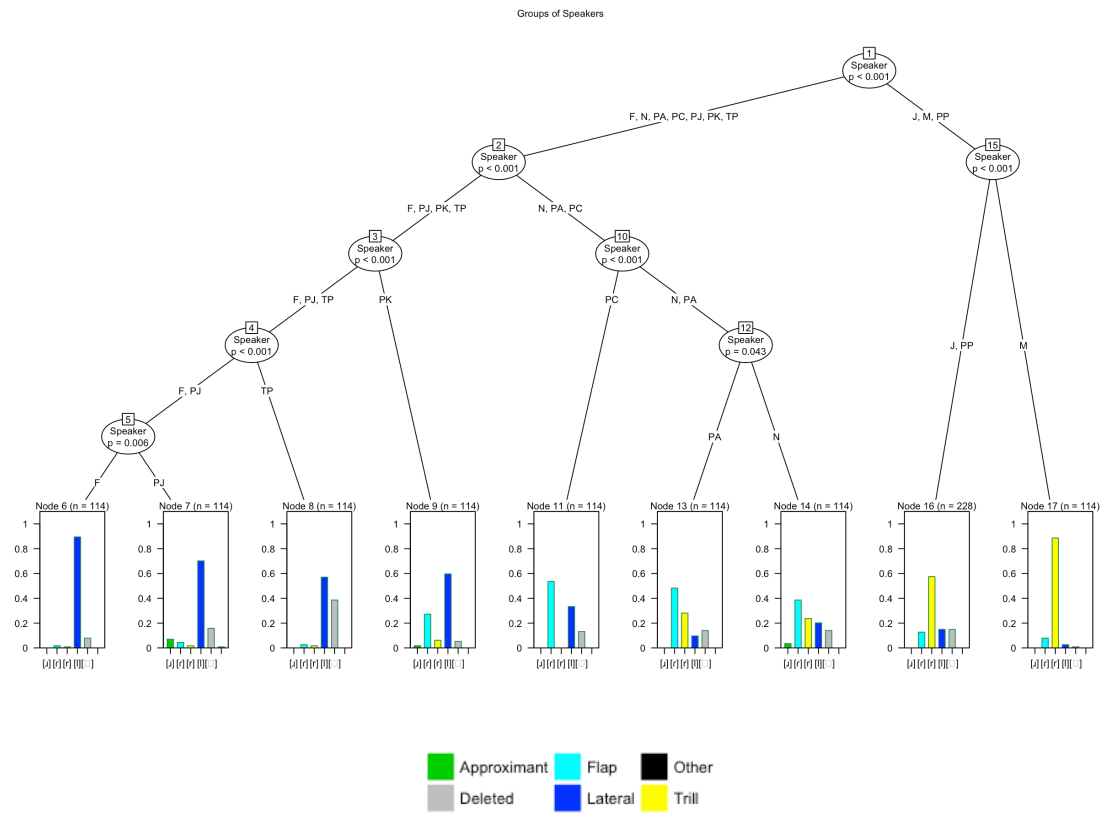


Figure 5.1: Distribution of Thai prevocalic /r/ variants according to speaker

5.3 Statistical analysis

A total of 1140 tokens of prevocalic /r/ were statically analysed according to six predictors, including syllable stress, preceding sound, age group, gender, speech style, and proficiency as based on IELTS speaking score. This analysis aimed to discover the relationships between the linguistic variant used and both linguistic as well as extralinguistic parameters which may promote or discourage /r/-/l/ merger. The quantitative analysis showed a total of five major realisations in this data set, including the trill [r], flap [ɾ], approximant [ɹ], lateral [l], and deletion [Ø]. Deletion [Ø] was found only in the syllable-initial cluster occurring when the second member of the initial cluster was deleted which was also regarded as the merger of /r/ and /l/ in Thai. This is because either /r/ or /l/ as the cluster member can be omitted, as in [k̄ɔ̄:ŋ] for either /kr̄ɔ̄:ŋ/ ‘to filter’ or /kl̄ɔ̄:ŋ/ ‘drum’.

It should be noted again that the standard variants in the Thai prevocalic /r/ are the flap [ɾ] and trill [r] whereas the approximant [ɹ], lateral [l], and cluster deletion [Ø] are non-standard features. As far as stigmatisation is concerned, Beebe (1974: 232) suggested that among the variants of the single initial /r/, the lateral [l] has the lowest status. With regard to the initial cluster, according to Beebe (1974: 233), the lateral [l] is related to an intermediate position of being non-standard because /r/-cluster omission [Ø] is associated with lower status than is replacement with [l]. For example, /kr̄ɔ̄:ŋ/ ‘to filter’ was less stigmatised when pronounced as [kl̄ɔ̄:ŋ] rather than [k̄ɔ̄:ŋ] although these substitution with [l] and /r/-cluster deletion [Ø] are both non-standard forms and should be pronounced as either [kr̄ɔ̄:ŋ] or [k̄ɔ̄:ŋ]. In Thai, the trill [r], which is used in very formal contexts (Beebe 1974; Treyakul 1986; Phootirat 2012; Pookkawes 2014), has the highest status pre-vocally, whereas the lateral [l] in initial position or /r/-cluster deletion [Ø] in an initial cluster, according to Beebe (1974), are considered to have the lowest status in the prevocalic /r/. As the trill [r] occupies the highest status and is realised in careful and emphatic speech, it might be expected that it would be found less frequently than the flap [ɾ] in ordinary speech.

Then these five variants were split into two levels of the dependent variable as /r/-/l/ distinction and /r/-/l/ merger. The phonological process of /r/-/l/ merger in Thai involves the merger of /r/ and /l/ to either /l/ or the deletion of /r/ and /l/ as cluster members (Phootirat 2012: 132). The variants of /r/-/l/ distinction in the present study are thus the flap [ɾ], trill [r] and approximant [ɹ], while production of the lateral [l] and cluster deletion [Ø] are considered to represent /r/-/l/ merger. For this reason, [l̄ā:] for /r̄ā:/ ‘fungus’ is related to /r/-/l/ merger, while [r̄ā:], [ɾ̄ā:], and [ɹ̄ā:] are associated with /r/-/l/ distinction. In initial cluster, both [kl̄ɔ̄:ŋ]

and [k̄ɔ̄:ŋ] for /kr̄ɔ̄:ŋ/ ‘to filter’ are regarded as /r/-/l/ merger, whereas [kr̄ɔ̄:ŋ], [kr̄ɔ̄:ŋ], and [k̄ɔ̄:ŋ] preserve the /r/-/l/ distinction.

The mixed effects regression investigated which specific variant is yielded by the effect of different factors. The intercept of the dependent variable or binary variant revealed two alternatives that an individual may prefer, as either ‘/r/-/l/ distinction’ coded as ‘0’ or ‘/r/-/l/ merger’ coded as ‘1’. Therefore, negative or positive estimates in the regression coefficients respectively refer to a tendency to prefer either distinction or merger. A model of best fit, as determined by the generalised mixed effects logistic regression, has more than one row of coefficients for the factor levels. For example, the preceding sound has three rows of coefficients including preceding consonant, preceding pause, and preceding vowel. Note that there is not one for preceding consonant because ‘consonant’ is the reference level or the baseline for this predictor. R assigns the first factor level to be the reference level in alphabetical order. When several predictors are taken into account at once to consider the combined effects of these factors, the first in alphabetical order of all factors included in the model of best fit are in the baseline as reference level. A p-value of less than 0.05 suggests that the slope is not zero, which in turn suggests that the changes in response variable, either /r/-/l/ distinction or merger, depends on the changes in predictor variable, so it is unlikely that the observed difference is due to chance.

The variable predictors excluded from the model of best fit, shown in Table 5.1, did not contribute significantly to the variation in the dependent variable. As a result, the choice of /r/-/l/ distinction or merger was not connected to syllable stress and IELTS speaking score. According to the mixed effects model, the p-values of less than 0.05 suggested that the linguistic factor of the preceding segment and the extralinguistic predictors of age group, gender, and speech style governed the choice of /r/-/l/ merger in L1 Thai.

With regard to the effect of the preceding sound, the p-values of less than 0.05 indicate that the effects of a preceding pause and a preceding vowel were significantly different from that of a preceding consonant in the baseline. The effects of a preceding pause and a preceding vowel were more likely to lead to the distinction between /r/ and /l/ than a preceding consonant, with estimates respectively of -1.15 and -1.56. The effect of the preceding sound was plotted in Figure 5.6. Table 5.1 also suggests the influence of the non-interacting factor of the preceding segment on the baseline of the three interacting extralinguistic factors of age group, gender, and speech style. In this sense, it means that the coefficients for a preceding sound were only applicable to females in their 20s when reading a

minimal pair. Females aged in their 20s reading a minimal pair were found to similarly preserve the distinction between /r/ and /l/ both when /r/ followed a pause and followed a vowel, estimated respectively at -1.15 and -1.56.

A predictor of age group, gender, or speech styles was not significant on its own, but these three predictors made up a significant interaction with each other to affect the likelihood of /r/-/l/ merger. A likelihood ratio test comparing models with and without this interaction shows that the model was significantly improved with the inclusion of the interaction of these three independent variables. The interaction of these three variables suggests that the effect of one predictor variable depended on the value of other predictors. In this respect, age groups were significant for some genders in some speech styles, which were confirmed by the p-values of less than 0.05. The effect of these three interacting factors was plotted in Figure 5.2.

	Estimated coefficient	Std. Error	z value	Pr(> z)	N
(Intercept)	2.6223	1.4753	1.778	0.07549 .	
Preceding sound					
Preceding consonant (baseline)					740
Preceding pause	-1.1477	0.4106	-2.795	0.00519 **	330
Preceding vowel	-1.5556	0.4834	-3.218	0.00129 **	70
Age group: gender: speech style					
20s: female: reading a minimal pair (baseline)					120
20s: female: naming a picture	-3.3298	1.0778	-3.089	0.00201 **	18
20s: female: reading a passage	-1.6567	0.9181	-1.804	0.07116 .	84
20s: female: reading a word list	-0.3174	0.846	-0.375	0.7075	120
20s: male: reading a minimal pair	-5.4828	2.2274	-2.462	0.01384 *	80
20s: male: naming a picture	7.1713	1.3278	5.401	≤ 0.001 ***	12
20s: male: reading a passage	5.7672	1.0648	5.416	≤ 0.001 ***	56
20s: male: reading a word list	2.6411	0.9925	2.661	0.00779 **	80
30s+: female: reading a minimal pair	-2.8647	2.1648	-1.323	0.18573	80
30s+: female: naming a picture	3.6761	1.2403	2.964	0.00304 **	12

30s+: female: reading a passage	2.5845	0.9238	2.798	0.00515 **	56
30s+: female: reading a word list	0.7609	0.8425	0.903	0.36644	80
30s+: male: reading a minimal pair	6.2239	3.0558	2.037	0.04167 *	120
30s+: male: naming a picture	-8.4918	1.6587	-5.119	≤ 0.001 ***	18
30s+: male: reading a passage	-5.9233	1.2044	-4.918	≤ 0.001 ***	84
30s+: male: reading a word list	-3.2338	1.1089	-2.916	0.00354 **	120

Table 5.1: The best model including number of tokens (N). Positive numbers reflect more merger, negative numbers reflect more distinction. Random effects of word (sd = 0.7381) and speaker (sd = 2.2574). AIC = 954.4.

Because statistical analysis in Table 5.1 confirms that interacting factors of age group, gender, and speech style contributed significantly to the variation in the dependent variable, the next section, Section 5.4, illustrates how females and males aged in their 20s and 30s+ varied their production of /r/-/l/ merger in four speech styles.

5.4 Interacting factors of age group, gender, and speech style

As illustrated in Figure 5.2, female speakers aged in their 20s seem to illustrate stable stylistic variation given that the rates were consistent across four speech styles, with reading a minimal pair and a word list showing the higher frequencies of merger production. While the male counterparts patterned similarly to females aged in their 20s when naming a picture and reading a passage, males aged 20s reading a minimal pair and a word list exhibited the dramatically lower frequencies of /r/-/l/ merger, especially when reading a minimal pair. The higher rates of /r/-/l/ merger production of females than males aged in their 20s may follow Labov's (2001) 'Gender Paradox'. As suggested by Labov, females, who preserved the prestigious forms more than male speakers, were sometimes more likely to lead linguistic variation and change by adopting innovative vernacular forms than male speakers. As evidenced, male speakers aged in their 20s reading a minimal pair were associated with a considerable rate of /r/-/l/ distinction suggesting that these males lagged far behind other speakers on the use of /r/-/l/ merger. In this respect, stylistic variation among these males aged in their 20s did agree with existing literature suggesting that standard expression was found to be more frequent in formal contexts (Harris 1972; Beebe 1974; Treyakul 1986; Chunsuvimol 1993; Pulsup 1993; Phootirat 2012; Panyaatisin 2013; Pookkawes 2014).

Within age group of 30s+, the rates of /r/-/l/ merger were comparable among females and male counterparts in all speech styles, except for the task of naming a picture. There was

a decrease in /r-/l/ merger when males aged 30s+ naming a picture possibly suggesting that these male speakers paid closer attention to their speech when naming a picture which was the first task undertaken during recording session. This in turn resulted in higher frequencies of /r-/l/ distinction preservation in naming a picture. With regard to females in both age groups, the use of /r-/l/ merger was higher in all contexts among females aged in their 20s than females aged 30s+. This seems to follow the expected trend suggested by Beebe (1974) and Pookkawes (2014), who found that the standard features of prevocalic /r/ were more likely to be retained by older speakers. Males aged in their 20s were more likely to employ /r-/l/ merger than males aged 30s+ when naming a picture and reading a passage. In contrast, males aged in their 20s reading a minimal pair and a word list tended to preserve /r-/l/ distinction more frequently than male counterparts aged 30s+. Both females and males in both age groups displayed the similar frequencies in the use of merger when reading a passage suggesting that this informal speech style possibly lead the change to /r-/l/ merger.

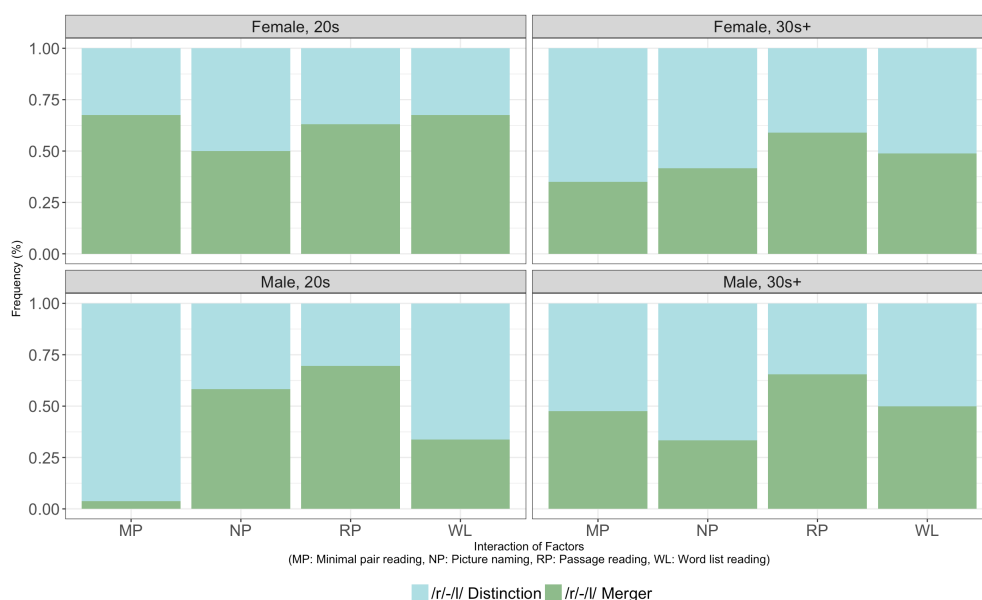


Figure 5.2: Thai prevocalic /r/: the merger of /r/ and /l/ according to age group, gender, and speech style

The next section deals with the relationship between each source of variation and speech production in turn. The proportion of the distributional pattern is demonstrated in the form of percentages followed by graphical representation. Following best practice in data visualisation, numbers are not included on the plots for ease of comprehension. Therefore, numbers of participants or tokens (N) are included only in the tables providing the frequencies.

5.5 Sources of variation

5.5.1 Syllable stress

This section explores what role syllable stress plays in /r/-l/ merger in L1 Thai. In the light of the retention of the underlying tone in a stressed syllable in Thai, the present study explores whether or not the observable segmental behaviour of /r/-l/ merger can be predicted on the basis of this Thai tonal behaviour. It is thus predicted that the non-standard variant of /r/-l/ merger is more likely to be found in unstressed syllables. On the other hand, for the standard variants of /r/-l/ contrast, preservation is expected in stressed or emphatic syllables in relation to the lexical tone preservation in stressed syllables in Thai. This is according to the case of /-t, -d/ deletion discussed in the Section 2.4.1 of Chapter 2, with deletion being adopted more frequently in unstressed than in stressed syllables.

Since there is an interaction of tone and stress in Thai, the actual tone is realised only in the context of a monosyllabic content word and the right-edge or head syllable of a polysyllabic word (Luksaneeyanawin 1998: 376). In other words, because the monosyllabic word and final syllable of polysyllabic word preserve an underlying tone, both of these syllables are then considered the stressed syllable in Thai. More detail of the tonal and stress system in Thai is provided in Section 2.3.1 of Chapter 2. For this reason, syllables may be stressed or unstressed in both monosyllabic and polysyllabic words. Stressed syllables such as in /rā:/ ‘fungus’, /k^hrāŋ/ ‘lac’, /k^hâu.rû:am/ ‘to participate’, and /pàk.p^hrūn/ ‘be riddled’ together with unstressed syllables such as in /râ:ŋ.kā:j/ ‘body’ or /krē:ŋ.klū:a/ ‘be afraid’, and /bò.rí.sùt/ ‘be pure’ are analysed in this section.

As is reported in Table 5.2, the production of the lateral [l], which is regarded as a non-standard rhotic, outnumbered the use of other variants in both positions of the syllable. The lateral [l] was chosen in stressed syllables 38.65% of the time, followed by in unstressed syllables 34.5% of the time. Interestingly, the prestigious standard trill [r] and /r/-cluster deletion [Ø], associated with the highest and lowest status of the prevocalic /r/ in Thai, were the second most preferred variants respectively in stressed and unstressed syllables, with proportions of the trill [r] in stressed syllables at 29.73% and omission [Ø] in unstressed syllables at 23.5%. The phoneme /r/ in an unstressed syllable was realised as the trill [r] 20.75% of the time, while in a stressed syllable the prevocalic /r/ was omitted at 8.78%. The flap [ɾ] was favoured at similar rates of 20.95% and 21% in stressed and unstressed syllables respectively. The approximant [ɹ] was the least frequent variant selected at 1.76% for stressed syllables and 0.25% for unstressed syllables.

Variant	Binary variant	Stressed syllable (Total 740)	Unstressed syllable (Total 400)
Trill [r] (N)	Distinction	29.73% (220)	20.75% (83)
Flap [ɾ] (N)		20.95% (155)	21% (84)
Approximant [ɹ] (N)		1.76% (13)	0.25% (1)
Other (N)		0.14% (1)	
Lateral [l] (N)	Merger	38.65% (286)	34.5% (138)
Deleted [Ø] (N)		8.78% (65)	23.5% (94)

Table 5.2: Distribution of Thai prevocalic /r/ variants according to syllable stress

As can be seen in Figure 5.3, showing the frequencies found in Table 5.2 above in the form of graphical representation, the modification towards the unmarked [l] occurred at similar frequencies in both syllables. In contrast, unmarked deletion [Ø] was generally found to be more frequent in unstressed syllables. As shown in Figure 5.3, /r/ in a stressed syllable was less liable to face reduction than /r/ in an unstressed syllable. Interestingly, the overall proportion of unmarked deletion [Ø] was lower than the use of the unmarked [l] in both positions, suggesting that the speakers still preferred to preserve the cluster member, whether a standard /r/ or a non-standard [l], instead of deleting it altogether. Moreover, the prestigious standard trill [r] was subject to a phonological constraint associated with syllable stress in the sense that the trill [r] was more likely to be preserved in stressed syllables.

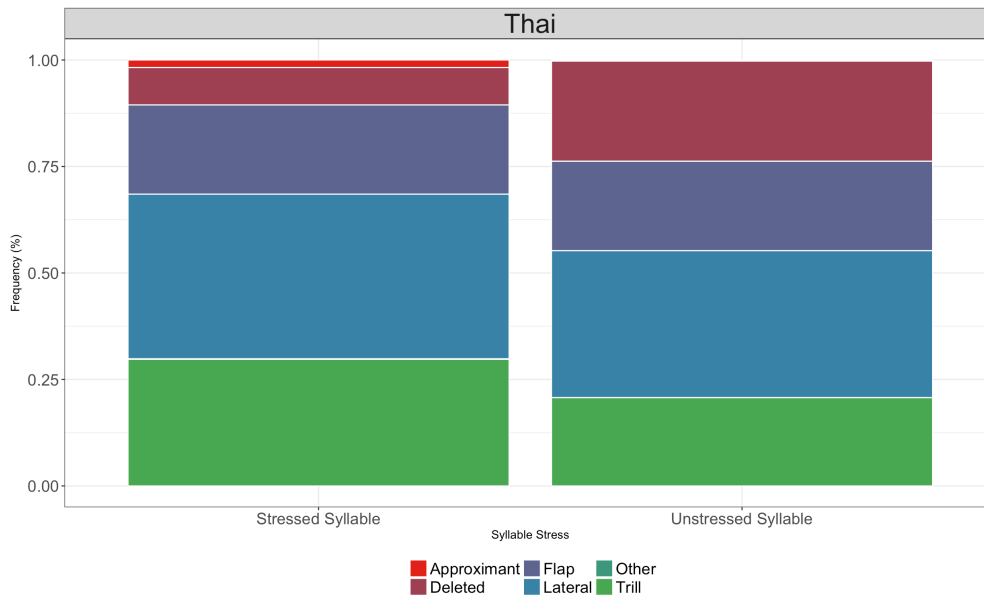


Figure 5.3: Distribution of Thai prevoicalic /r/ variants according to syllable stress

The variants found are then grouped into the binary variant of /r/-/l/ distinction and merger, as demonstrated in Table 5.2 above. The results shown in Figure 5.4 indicate that the distinction between /r/ and /l/ is maintained more frequently in stressed syllables than in unstressed syllables. This difference, however, was not statistically significant. According to the tonal system in Thai, the underlying tone surfaces only in stressed syllables. A lower rate of /r/-/l/ merger in stressed syllables might represent the influence of Thai tonal and stress patterns on the merger of /r/ and /l/. As a result, the data suggest that the non-standard /r/-/l/ merger started in unstressed syllables before advancing to stressed syllables. That is to say, merger was generally motivated by syllable stress, with unstressed syllables leading in the move towards the merger compared to stressed syllables, which confirms the prediction above. The results show that syllable stress yielded the hierarchy of /r/-/l/ merger, in higher to lower rates: unstressed > stressed syllables.

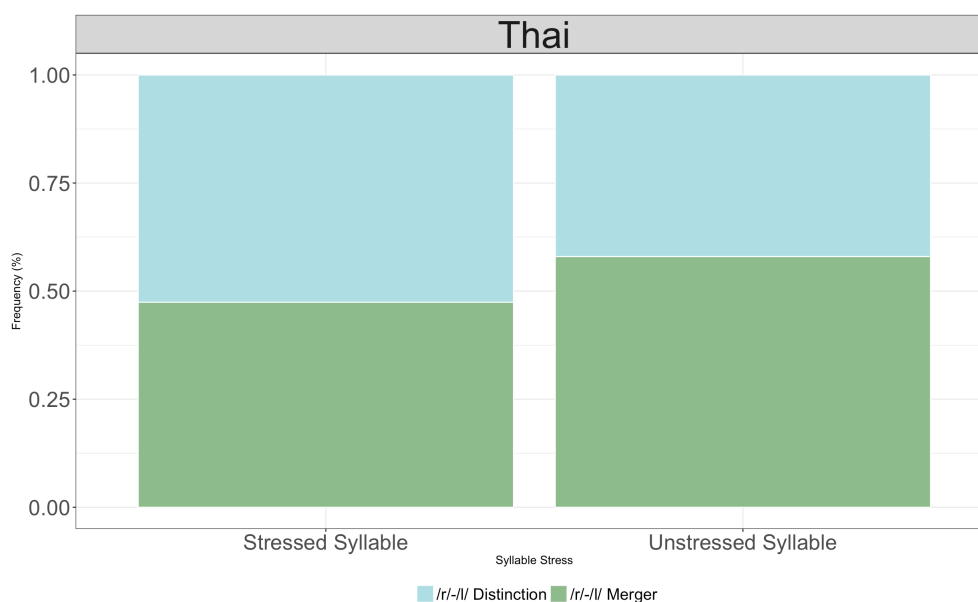


Figure 5.4: Thai prevocalic /r/: the merger of /r/ and /l/ according to syllable stress

5.5.2 Preceding sound

The phonetic context preceding the segment in question formed three groups: preceding pause, preceding vowel, and preceding consonant. In the context of preceding consonant, the prevocalic /r/ follows either a closed syllable or occupies the second cluster member. According to Keating et al. (2003), the interaction of space and time promotes domain-initial strengthening and lengthening. In this regard, a preceding pause is in a more salient position than a preceding vowel and consonant since speakers have more time to process what is coming after a preceding pause. It thus could be the case that a word-initial sound is most likely to be expressed as standard because it is the first sound in the sentence. On the other hand, a preceding consonant will have more of a co-articulatory effect on the next sound, and more so on a vowel, potentially leading to the lowest rates of standard expression. It is then expected in the present study that a preceding pause will be more likely to be followed by the retention of the /r/-/l/ contrast than would be the case with a preceding vowel or consonant, which in turn promotes /r/-/l/ merger.

The realisation data illustrated in Table 5.3 show that the non-standard lateral [l] represented the largest proportion among all preceding segments. The lateral [l] was selected most frequently with a preceding vowel at 45.71%, accompanied by a preceding pause at 37.88%, and a preceding consonant at 36.08%. The phoneme /r/ was realised as the standard flap [ɾ] when a preceding segment was a vowel, at 38.57%, which was the second most preferred variant, and 22.73% and 18.51% of the time with a preceding pause and consonant respectively. The prestigious standard trill [r] was selected as the second most frequent sound

with a preceding pause, at 35.45%, and a preceding consonant at 23.65%, while a preceding vowel was associated with fewer trills at 15.71%. The approximant [ɹ] was the least frequent variant used, with a preceding pause at 3.64% and a preceding consonant at 0.27%. The prevocalic /r/ was deleted 21.49% of the time with a preceding consonant.

Realisation		Preceding sound		
Variant	Binary variant	Pause (Total 330)	Vowel (Total 70)	Consonant (Total 740)
Trill [r] (N)	Distinction	35.45% (117)	15.71% (11)	23.65% (175)
Flap [ɾ] (N)		22.73% (75)	38.57% (27)	18.51% (137)
Approximant [ɹ] (N)		3.64% (12)		0.27% (2)
Other (N)		0.30% (1)		
Lateral [l] (N)	Merger	37.88% (125)	45.71% (32)	36.08% (267)
Deletion [Ø] (N)				21.49% (159)

Table 5.3: Distribution of Thai prevocalic /r/ variants according to preceding sound

As shown in Figure 5.5, a preceding pause was associated with the highest rate of production of the prestigious standard trill [r] and in turn a preceding vowel tended to be accompanied by the non-standard [l] and then the standard flap [ɾ]. It can be observed that a preceding consonant was followed by the highest-status trill [r] and lowest-status /r/-cluster deletion [Ø] at similar frequencies. Although all preceding phonological segments selected the lateral [l] as the predominant variant, the overall production of the flap [ɾ], trill [r] and approximant [ɹ] rhotics with a preceding pause and vowel was higher than the lateral [l]. In contrast, a preceding consonant more often led to the unmarked [l] and deleted [Ø] variants which were adopted at higher rates than the overall use of rhotics. It should be noted again that the context of a preceding sound in the present study involves /r/ following a closed syllable or /r/ being the cluster; however, the deleted [Ø] occurs only in a cluster context. In

this respect, the initial /r/ in a non-cluster context, which can be maintained or lateralised, will not be deleted at all.

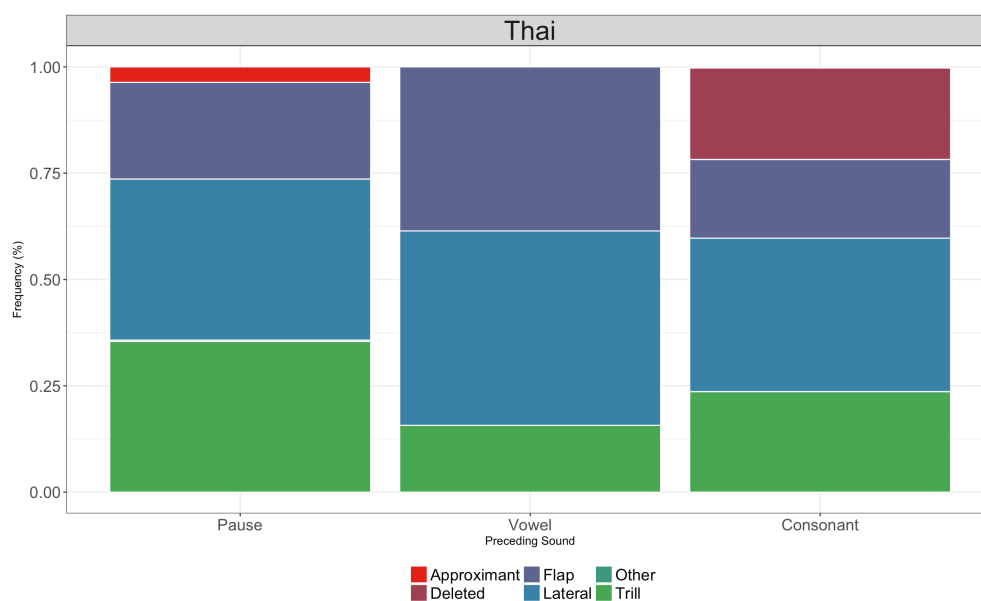


Figure 5.5: Distribution of Thai prevocalic /r/ variants according to preceding sound

The effect of preceding segment on /r/-/l/ merger can be seen in Figure 5.6. While a preceding pause and vowel was associated with the distinction between /r/ and /l/ at higher proportions than the /r/-/l/ merger, the rate of merger with a preceding consonant outweighed the /r/-/l/ distinction. For this reason, the /r/-/l/ merger was subject to a phonological constraint of preceding segment, with the distinction between /r/ and /l/ far more likely to be maintained with a preceding pause, followed by a preceding vowel and then a preceding consonant. Obviously, the stratification of the /r/-/l/ merger increases from left to right in the figure below. A preceding pause was in a more prominent position, there was thus considerable avoidance of the non-standard /r/-/l/ merger, whereas a preceding consonant led to the highest rate of merging application and the case with a preceding vowel fell in between. As can be seen, the findings corresponded to the hypothesis posited above, suggesting that merger was generally constrained by the preceding sound, with a preceding consonant more likely to promote the /r/-/l/ merger compared to a preceding vowel or a preceding pause. The preceding segments can be arranged hierarchically according to the frequency of the merger of /r/ and /l/: consonant > vowel > pause.

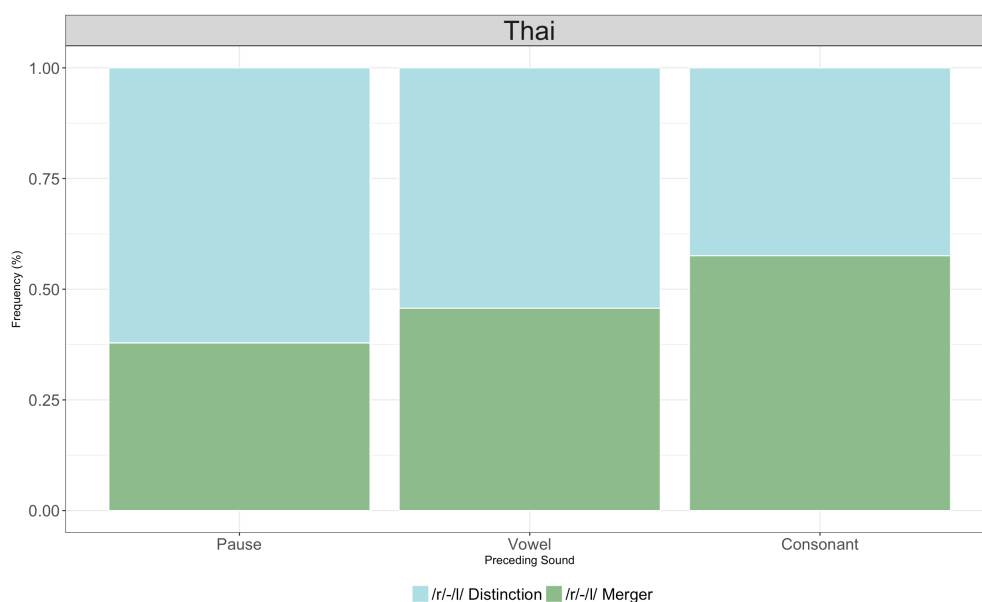


Figure 5.6: Thai prevocalic /r/: the merger of /r/ and /l/ according to preceding sound

5.5.3 Age

It is suggested in the existing literature that age comes into play in the sound variation of liquids in Thai (Beebe 1974; Pookkawes 2014), with the standard sound being more likely to be retained by older speakers, who in the current study are aged in their 30s+. There were ten respondents in the present study with ages varying from 20 to 42. These speakers were then categorised into two groups in their 20s and 30s+, with five speakers in each group.

As can be seen from Table 5.4, the frequencies of pronunciation in the two age groups were different for the rhotic variants but quite similar for the non-standard features. With standard Thai rhotics, those in their 20s tended to use the trill [r] at 34.39%, which was approximately twice as frequently as did the 30s+ subjects, at 18.77%. On the other hand, the subjects showed the opposite feature in the choice of the flap [ɾ], which was selected more often by the 30s+, at 29.65%, than the 20s, at 12.28%. The non-standard lateral [l], again, was the most preferred variant exhibited by those in the 20s and 30s+ groups at similar rates of 37.89% and 36.49% respectively. In the 20s group, 14.74% deleted /r/, which was marginally higher than the 30s+ group at 13.16%. The approximant [ɹ] was the least preferred variant, selected at 0.7% by the 20s and 1.75% by the 30s+.

Realisation		Age group	
Variant	Binary variant	20s (Total 570)	30s+ (Total 570)
Trill [r] (N)	Distinction	34.39% (196)	18.77% (107)
Flap [ɾ] (N)		12.28% (70)	29.65% (169)
Approximant [ɹ] (N)		0.7% (4)	1.75% (10)
Other (N)			0.18% (1)
Lateral [l] (N)	Merger	37.89% (216)	36.49% (208)
Deletion [Ø] (N)		14.74% (84)	13.16% (75)

Table 5.4: Distribution of Thai prevocalic /r/ variants according to age group

As demonstrated in Figure 5.7, while those aged in their 30s+ showed larger proportions of the use of the flap [ɾ] and approximant [ɹ], those in the 20s group were the predominant users of the trill [r], lateral [l], and omission [Ø]. The use of the standard flap [ɾ] by the older speakers supported the hypothesis, whereas the higher production of the prestigious standard trill [r] by the 20s group showed a more contradictory distributional pattern. The production of the lateral [l] and deleted [Ø] variants favoured by the 20s slightly more frequently than the 30s+ also confirmed the hypothesis.

The use of the trill [r] in the present study was not consistent with Pookkawes's (2014: 108) finding that the trill [r] was used most often by older respondents. However, the present results for the use of laterals by the younger subjects were in agreement with those of her study. The use of /r/-cluster deletion [Ø] was somewhat similar to the patterns found by Beebe (1974) and Pookkawes (2014: 136), who reported that /r/-cluster omission [Ø] in L1 Thai was selected by the younger speakers at higher rates than in older groups. In Pookkawes's study, the younger, middle-aged, and older groups are those aged in the ranges 18-25, 35-45, and 50-

65 years respectively. As a result, while the younger groups in her study and the present study are comparable, her middle-aged group is similar to the 30s+ in the present study. Pookkawes’s age group of older subjects is absent in the present study, in which the oldest participant study was aged 42. The findings in the present study turn out to be the case that, in their extensive use of the trill [r], the younger generation are attempting to conserve the prestigious standard trill [r].

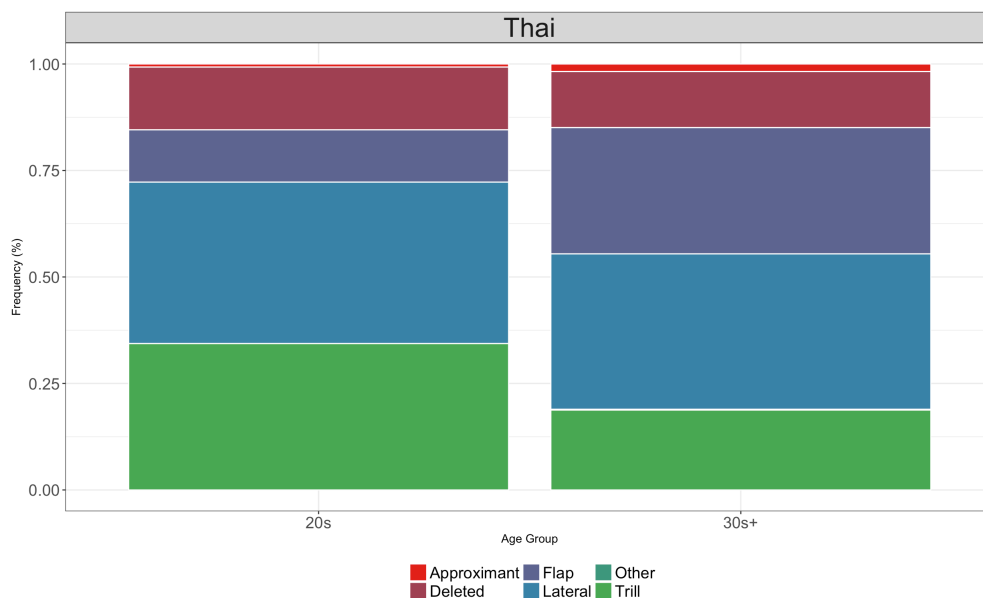


Figure 5.7: Distribution of Thai prevocalic /r/ variants according to age group

Figure 5.8 demonstrates the prevocalic variants in terms of individuals’ age when treated as a continuous variable. As can be seen, the younger speakers showed the tendency towards the use of prestigious standard Thai trill [r] followed by the deletion of /r/ cluster. The older subjects, in contrast, were more likely to use the non-standard approximant [ɹ]. In other words, as age increases, the use of the trill [r] declines, with increasing production of the approximant [ɹ] regarded as the standard rhotic of English. The use of deletion [Ø] was quite stable among all age range. While those aged between 25-30 years old showed the highest rates of the lateral [l] use, the speakers aged between 30-40 preferred to use the standard flap [ɾ] to other variants. For information on the ages of speakers, see Table 4.1.

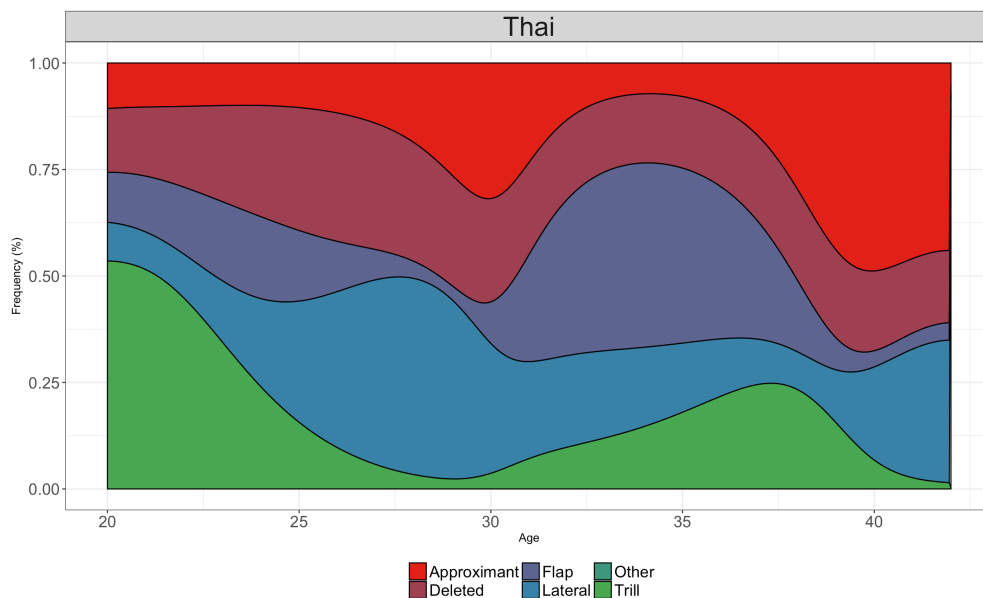


Figure 5.8: Distribution of Thai prevocalic /r/ variants according to age

Figure 5.9 illustrates how age group governed the expression of /r-/l/ merger. The variation in the merger of /r/ and /l/ in L1 Thai could be described as nearly stable because both generations tended to show similar distributional patterns. In other words, it is worth noting that the effect of age group on the production of the /r-/l/ merger in Figure 5.9 is very small. As a result, the loss of the /r-/l/ distinction was not strongly affected by age. Albeit with a similar rate of occurrence, the 30s+ generally still followed the expected trend as the predominant users of the /r-/l/ distinction. The stronger distinction between /r/ and /l/ in the 30s+ group supports the hypothesis that older speakers tend to preserve the standard realisation of /r-/l/ distinction more often than the younger. That is to say, the production of /r-/l/ distinction increased as the age of the speakers increased. The age groups of the 20s and 30s+ produced the order for the merger of /r/ and /l/ in higher to lower rates: 20s > 30s+.

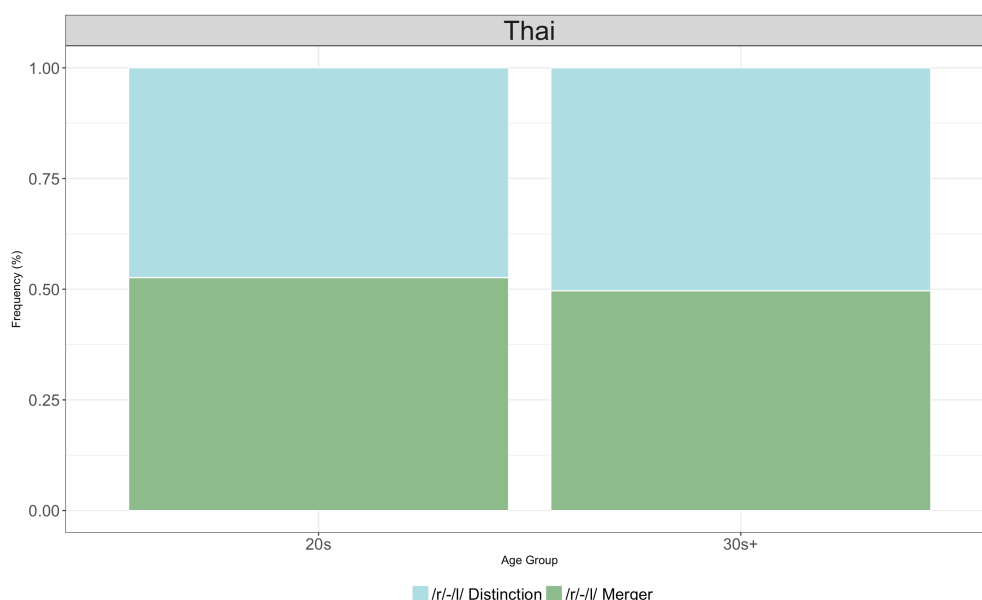


Figure 5.9: Thai prevocalic /r/: the merger of /r/ and /l/ according to age group

This agrees with Chambers's (1995) proposal of three formative periods, in which younger subjects are much more distant from standard variants than older speakers. The findings of Macaulay's (1977) study of Glasgow was interpreted by Sankoff (2004: 2-4) who suggested that among upper-class and middle-class adolescents, the stigmatised T-glottalling of English was shifted to the prestigious variant [t] when more formal and standard speech was required in a new social position. Of course, the age groups of the subjects in these studies were different from those in the present study because they were comparing young and old whereas two age groups in the present study were quite similar. This has to be acknowledged when drawing inferences from the findings of the present study. In a study by Holmes-Elliott (2012) of th-fronting, 'fink' for 'think', three working-class female speakers from the East End of London were analysed at six points in time. It was found that these speakers had higher rates of 'fink' use during adolescence but this declined when they were in their 30s. The possible reason for this was their careers. They withdrew from the use of non-standard features when they entered certain life stages.

5.5.4 Gender

The effect of gender on the variation is of interest in existing literature. In L1 Thai, it has been suggested by Chunsuvimol (1993), as discussed in Section 2.6 of Chapter 2, that females tend to show a more frequent usage of standard flap [r] and trill [r] variants than male speakers. Then it would be expected in the present study that the standard rhotics, which then resulted in distinction between /r/ and /l/, would be adopted by females at higher proportions than by males. There were five females and five males in the present study, and the quantitative

results shown in Table 5.5 do indicate that the frequencies of the sound production of the prevocalic /r/ of males and females differed. Females and males exhibited different trends in the usage of the flap [ɾ] and trill [r]. That is, females produced the trill [r] at 31.05%, more frequently than males, at 22.11%. In contrast, the flap [ɾ] was found to be more frequent in males as the most preferred variant, at 31.05%, which was approximately three times as often as in females, at 10.88%. As with the non-standard variants, the lateral [l] was chosen by females, at 43.68%, more than by males, at 30.7%. The /r/ was deleted at similar rates by females and males at 14.04% and 13.86% respectively. Females exhibited the approximant [ɹ], at 0.35%, slightly less frequently than males, at 2.11%.

Realisation		Gender	
Variant	Binary variant	Female (Total 570)	Male (Total 570)
Trill [r] (N)	Distinction	31.05% (177)	22.11% (126)
Flap [ɾ] (N)		10.88% (62)	31.05% (177)
Approximant [ɹ] (N)		0.35% (2)	2.11% (12)
Other (N)			0.18% (1)
Lateral [l] (N)	Merger	43.68% (249)	30.7% (175)
Deletion [Ø] (N)		14.04% (80)	13.86% (79)

Table 5.5: Distribution of Thai prevocalic /r/ variants according to gender

In the present study, as shown in Figure 5.10, the non-standard [l] and /r/-cluster omission [Ø] were more frequently employed by females rather than males. Chunsuvimol (1993) found that the standard Thai flap [ɾ] and trill [r] were more commonly heard in females than in males, whereas /r/-cluster deletion [Ø] was produced more than 50% of the time by both genders, with higher rates by the males. Pookkawes (2014) reported that deletion [Ø] was more often employed by females, while males selected the lateral [l] at a higher rate in both initial and initial cluster positions. For this reason, the findings in the present study in

terms of the similar use of dropping /r/ of both females and males supported neither Pookkawes’s (2014) nor those of Chunsuvimol (1993). Moreover, the more frequent use of the flap [ɾ] by males and the lateral [l] by females in the present study contradicted the results of Chunsuvimol (1993) and Pookkawes (2014) respectively. The results that females showed a tendency to conserve the prestigious standard trill [r] in the present study are similar to the suggestion in Chunsuvimol (1993) that the standard trill [r] variant is more likely to be expressed by females.

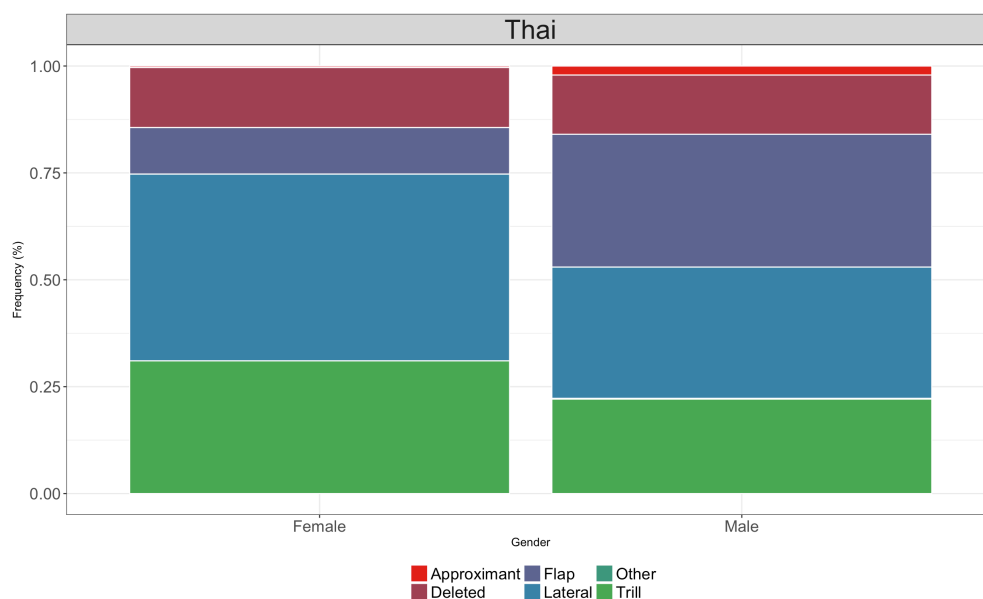


Figure 5.10: Distribution of Thai prevocalic /r/ variants according to gender

The results shown in Figure 5.11 demonstrates differences in the adoption of /r/-/l/ merger between the genders. It may be somewhat surprising that, in the present study, males exhibited the preservation of /r/-/l/ allophonic distinction more regularly than females. For males, the distinction between /r/ and /l/ was stronger perhaps because males were more aware of the stigmatisation and made an attempt to avoid non-standard /r/-/l/ merger, and thus tended to conserve the distinction. The possible explanation offered was based on Labov’s (2001) ‘Gender Paradox’, which suggested that, according to change from above the level of conscious awareness, females tended to preserve the prestigious or standard features. In contrast, in relation to change from below the level of conscious awareness, females were innovators of linguistic variation and change. This suggests that non-standard variant of /r/-/l/ merger was more strongly advanced by females. This might be in accordance with Milroy’s (1987) investigation of three working-class communities in Belfast, in which the use of the non-standard feature, by women, is related to the position in the workforce or presence within a tight social network, rather than gender. It is the case as shown in Figure 5.10 that females

were associated with the prestigious trill, but these females, however, were found to more frequently use /r-/l/ merger because of the predominant use of the lateral [l]. In the present study, the genders are arranged hierarchically in terms of the frequency of /r-/l/ merger from higher to lower rates: female > male.

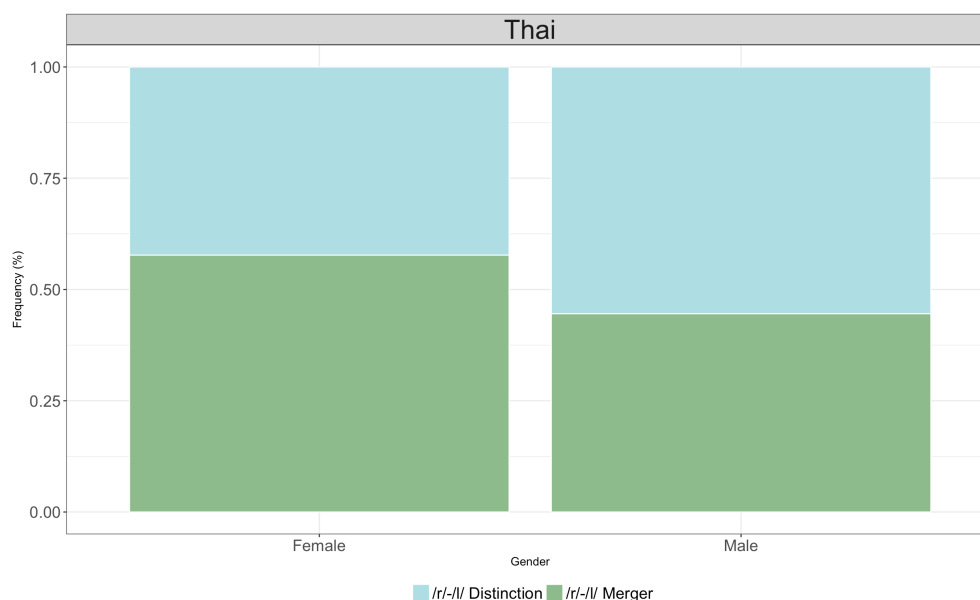


Figure 5.11: Thai prevocalic /r/: the merger of /r/ and /l/ according to gender

5.5.5 Speech style

As is well known, the evidence in the existing literature suggests that the non-standard variant of the /r-/l/ merger is a stylistically salient variable in Thai (Beebe 1974; Treyakul 1986; Pulsup 1993; Chunsuvimol 1993; Pookkawes 2014). Although both the trill [r] and flap [ɾ] are standard rhotics in Thai (Tingsabadh and Abramson 1993; Harris 1996), it is commonly found that the trill [r] is only used in very formal situations and emphatic speech, especially in news broadcasting, the academic field, and formal public speech (Beebe 1974; Treyakul 1986; Harris 1996). Meanwhile the flap [ɾ] is common in ordinary use by Thai speakers. From the perspective of markedness, a shift towards merger is possibly due to the modification towards the unmarked, where the more marked /r/ is substituted with an unmarked [l] or deletion [Ø].

In the present study, a total of 1140 tokens extracted from four reading styles, including naming a picture (NP), reading a passage (RP), reading a word-list (WL), and reading a minimal pair (MP) have been considered. These four tasks represent four different levels of formality. To put it simply, the NP task is regarded as the least formal context, followed by the RP, and then WL, so the MP represents the highest degree of formality. Of

course, there is no gradual progression from least to most formal style in the four tasks, from NP to MP, so the continuum of styles is possibly not well justified. The number of tokens is constant across speakers, but the amount of spontaneity in each task is expected to be different. As a result, it was hypothesised in the present study that the formality of speech style would connect to choice of sound variation. That is, the distinction between /r/ and /l/ would be used more frequently in the formal contexts WL and MP, in contrast to the use of non-standard merger in the less formal situations NP and RP.

It could be suggested according to the frequencies shown in Table 5.6 that the differences observed here are not very sizeable. The prevocalic /r/ was realised as the lateral [l] at the highest rates across almost all styles, except for RP whose most frequent variant was /r/ omission [Ø]. The lateral [l] was exhibited in RP and WL at the lowest and highest rates of 30.71% and 41.25% respectively, while NP included the lateral [l] at 35%, which was slightly less often than with MP 38% of the time. The use of /r/-cluster deletion [Ø] considerably declined from 33.57% in RP to 4.25% in MP and with intermediate and approximately equal frequencies in NP at 10% and WL at 10.5%. For the standard Thai rhotics, the flap [ɾ] and trill [r] were adopted respectively at 23.33% and 31.67% in NP, 20.71% and 15% in RP, 20.75% and 27% in WL, and 21% and 33.5% in MP. More or less, the trill [r] was used in MP, WL, and NP twice as frequently as in RP, while the flap [ɾ] was chosen at similar rates in all styles. The approximant [ɹ], which is a non-standard Thai rhotic, was used only in the most careful speech of WL, at 0.5%, and MP, at 3%.

Realisation		Speech style			
Variant	Binary variant	Naming picture (Total 60)	Reading passage (Total 280)	Reading word list (Total 400)	Reading minimal pair (Total 400)
Trill [r] (N)	Distinction	31.67% (19)	15% (42)	27% (108)	33.5% (134)
Flap [ɾ] (N)		23.33% (14)	20.71% (58)	20.75% (83)	21% (84)
Approximant [ɹ] (N)				0.5% (2)	3% (12)
Other (N)					0.25% (1)
Lateral [l] (N)	Merger	35% (21)	30.71% (86)	41.25% (165)	38% (152)
Deletion [Ø] (N)		10% (6)	33.57% (94)	10.5% (42)	4.25% (17)

Table 5.6: Distribution of Thai prevocalic /r/ variants according to speech style

As the results shown in Figure 5.12 demonstrate, the predominant variant selected across all styles corresponded to the modification towards the unmarked variants. It could be suggested that the speakers were aware of style shifting from RP to MP. In this sense, the prestigious standard trill [r] was used more frequently in the most formal context of MP twice as frequently as in the connected speech of RP, wherein the /r/-cluster deletion [Ø] was employed approximately eight times as often as in the most careful style of MP. It is worth noting again that, among the five variants of prevocalic /r/ in Thai, the trill [r] and /r/ omission [Ø] are considered to have the highest and lowest status respectively. As far as the tasks representing the different stylistic situations are concerned, Treyakul (1986) indicated that the prestigious standard trill [r] was preferred in a minimal pair reading task, while the standard flap [ɾ] was found in passage reading. According to Panyaatisin (2013), in minimal pair reading, the trill [r] was most frequently employed, and the lateral [l] was the predominant variant in passage reading. For this reason, the highest use of trill [r] in MP in the present study supports these suggestions of Treyakul (1986) and Panyaatisin (2013). The largest proportion of the flap [ɾ] production in NP instead of RP contradicts Treyakul's findings,

however. Moreover, the more frequent use of the deletion [Ø] rather than the lateral [l] in RP in the present study does not support the findings in Panyaatisin’s study.

According to Pulsup (1993), who studied how high-school students pronounced /r/ and /l/ as cluster members in five speech styles representing different levels of formality, the subjects still retained the liquids in an initial cluster, especially in formal contexts, and tended to omit a cluster member in less formal styles. The largest and smallest proportion of /r/-cluster deletion [Ø] in RP and MP respectively in the present study thus supports Pulsup’s findings. As shown in Figure 5.12, while the RP included a considerable amount of /r/-cluster deletion [Ø], the other three styles showed the predominant use of the lateral [l].

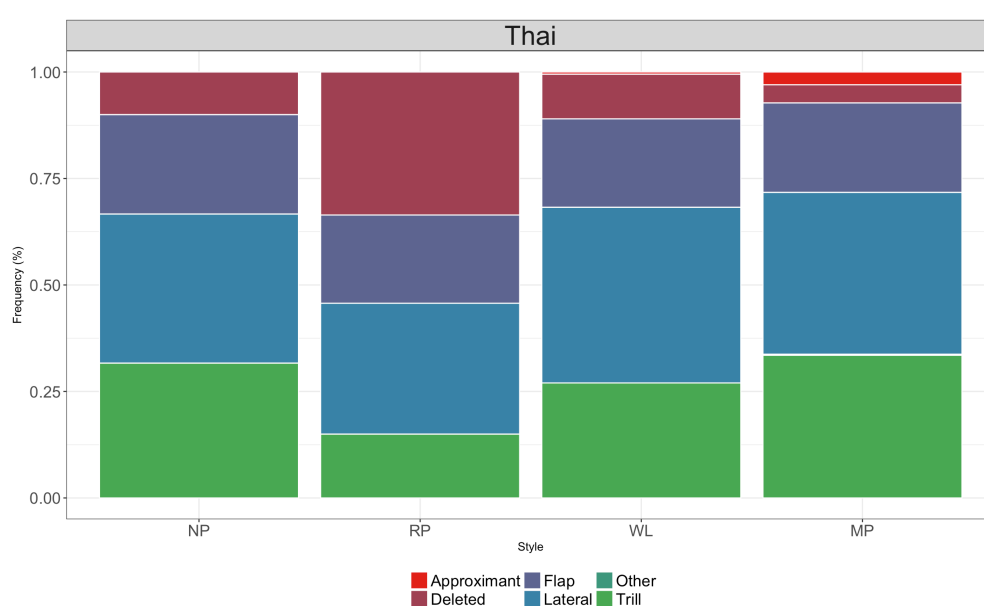


Figure 5.12: Distribution of Thai prevocalic /r/ variants according to speech style

As can be seen in Figure 5.13, the careful speech of MP and the casual context of NP involved the most frequent /r/-/l/ distinction, whereas the connected speech of RP was more likely to involve non-standard /r/-/l/ merger than in other speech styles. Although the speech patterns found in MP follow the hypothesis suggested above, the large proportion of /r/-/l/ distinction usage in NP is an unexpected result. A possible explanation for this, albeit without orthographical support, could be that the task sequence of the NP as the first task undertaken might affect the speakers’ oral production. Consequently, the respondents were possibly not yet relaxed but, as the speakers became more relaxed during the rest of the session, monitored their speech more closely. This therefore might be a limitation of the present study. In addition, the correct answers given to all pictures in the NP task targeted monosyllabic words, which might have enabled the subjects to read them using more careful and conscious behaviour and leading to the retention of /r/-/l/ distinction. According to Phootirat (2012: 65),

NP is regarded as involving a more formal style in relation to interviews due to the speakers' conceptualisation of pictures resulting in more attention being paid to each image.

The merger of /r/ and /l/ is thus sensitive to style-shifting in three contexts, with rates declining from RP to WL and then MP. For this reason, the similar distributional patterns found in the most informal NP and formal MP tasks suggest that speech production of the Thai prevocalic /r/ is not completely conditioned by the degree of formality, due to the exception represented by the informal task of NP. However, the presentation of results in this manner may not take into account that the pronunciation of words may be influenced according to whether they are encountered as single syllable words in NP and MP, connected speech in RP, or bisyllabic words in WL. In terms of speech styles, the order of constraint favouring the merger of /r/ and /l/ from higher to lower rates is: RP > WL > NP > MP.

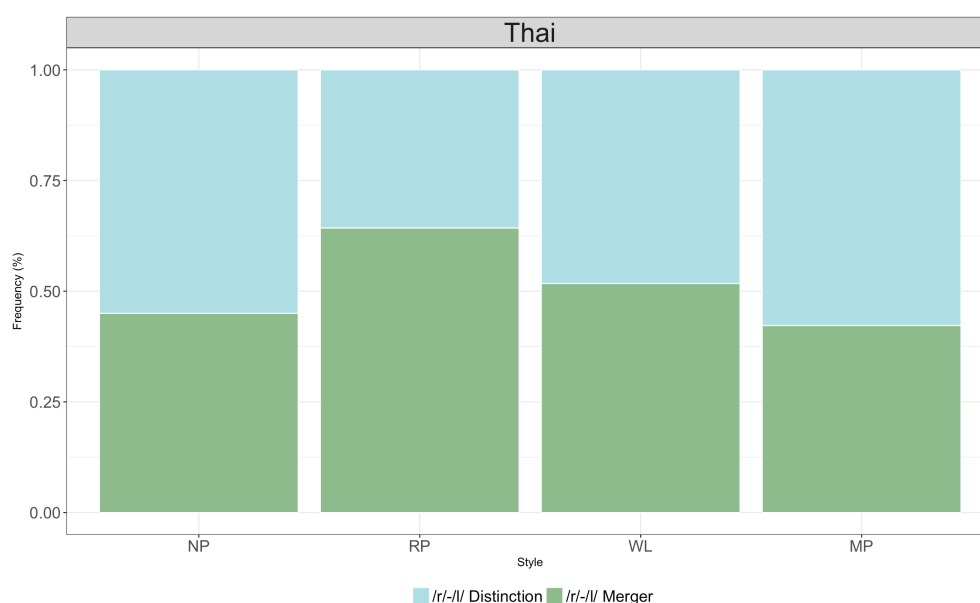


Figure 5.13: Thai prevocalic /r/: the merger of /r/ and /l/ according to speech style

5.5.6 IELTS Speaking Score

The assessment of proficiency levels of the speakers was based on IELTS speaking scores, which reflects subjects' speaking style. It might be the case that speakers with higher scores were the kind of people who paid closer attention to speech production and therefore aimed for standard variants more often than subjects with lower speaking scores. As a result, the use of non-standard variants of the lateral [l] and /r/-cluster deletion was expected to be found in those with lower speaking scores who were possibly less careful in using the standard features. Moreover, among the variants of Thai rhotics, it has been indicated that the use of an approximant [ɹ] in the initial position and initial-cluster /r/ was found in Thai speakers who

had studied in international schools in Thailand or had studied abroad or were fluent in English (Beebe 1974: 119; Chunsuvimol 1993; Phootirat 2012). For this reason, the hypothesis predicting that speakers with higher IELTS speaking scores are more likely to preserve the /r-/l/ distinction more often than subjects with lower scores has been put forward.

In the present study, five speakers scored 5.5 in the IELTS speaking test. Of the remainder, four scored 6, and the other scored 6.5. It seems appropriate to divide the speakers into two groups, those scoring 5.5 being the first group - the 5s - and those scoring 6 or above in the second group - the 6s, in this way ensuring there were equal numbers in the two groups which seems more suitable for statistical purposes. Moreover, it is more appropriate to analyse two groups rather than each speaker individually because the range of scores among the speakers is very small.

As shown in Table 5.7, the main selected variants between the two groups were different. The non-standard lateral [l] was the most preferred variant for the 5s, at 44.56%, whereas the 6s showed a tendency towards pronunciation of the prestigious standard trill [r] at 36.32%. In contrast, the 5s adopted the trill [r] at 16.84%, approximately half as often as the 6s, who in turn selected the lateral [l] 29.82% of the time. With the standard flap rhotic [ɾ], the 5s chose the flap [ɾ] at 22.63%, which was slightly more regularly than the 6s, at 19.3%. Both 5s and 6s showed similar rates of /r/-cluster deletion [Ø] use, respectively at 13.68% and 14.21%. The approximant [ɹ], which was the least frequently selected sound, was employed by the 5s at 2.11% at a higher rate than for the 6s, at 0.35%. It was clear in Table 5.7 below that the main difference between the groups is in the production of the trill [r] and lateral [l].

Realisation		IELTS speaking score	
Variant	Binary variant	5s (Total 570)	6s (Total 570)
Trill [r] (N)	Distinction	16.84% (96)	36.32% (207)
Flap [ɾ] (N)		22.63% (129)	19.3% (110)
Approximant [ɹ] (N)		2.11% (12)	0.35% (2)
Other (N)		0.18% (1)	
Lateral [l] (N)	Merger	44.56% (254)	29.82% (170)
Deleted [Ø] (N)		13.68% (78)	14.21% (81)

Table 5.7: Distribution of Thai prevocalic /r/ variants according to IELTS speaking score

The effect of proficiency as based on IELTS speaking score is illustrated in the form of graphical representation in Figure 5.14. As can be seen, the trill [r] and /r/-cluster omission [Ø] were positively related to IELTS speaking score, while the flap [ɾ], lateral [l], and approximant [ɹ] showed a negative relationship. That is, speakers with higher IELTS speaking scores exhibited more frequent use of the trill [r] and cluster deletion [Ø] and less use of the flap [ɾ], lateral [l], and approximant [ɹ]. For this reason, the findings in terms of the higher use of the prestigious standard trill [r] by the 6s compared to the 5s confirms the prediction made above. However, the suggestion expecting a higher use of the approximant [ɹ] by speakers with higher scores did not hold true, as a lower rate of approximant [ɹ] usage was found among the speakers who were more fluent in English. A declining use of the non-standard lateral [l] and higher use of the prestigious standard trill [r] by the 6s might suggest that the 6s are more aware of their pronunciation and do not transfer the approximant [ɹ] used in L2 English when pronouncing the prevocalic /r/ in L1 Thai.

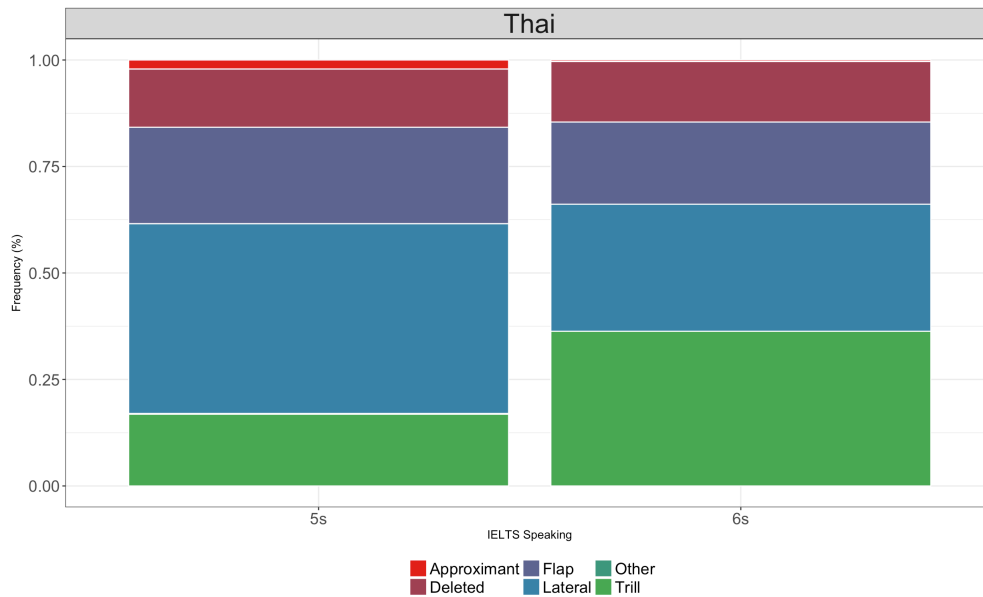


Figure 5.14: Distribution of Thai prevocalic /r/ variants according to IELTS speaking score

The effect of proficiency as based on IELTS speaking score on /r-/l/ merger can be seen in Figure 5.15. The merger of /r/ and /l/ is clearly sensitive to IELTS speaking score. The higher IELTS speaking score of a speaker, the less likely /r-/l/ merger is to be used. The majority of the 6s are shown to lead in the move towards the distinction between /r/ and /l/ than the 5s. A positive relationship between /r-/l/ distinction and IELTS speaking score thus supported the hypothesis. The IELTS speaking scores of the 5s and 6s yield the order for the merger of /r/ and /l/: 5s > 6s.

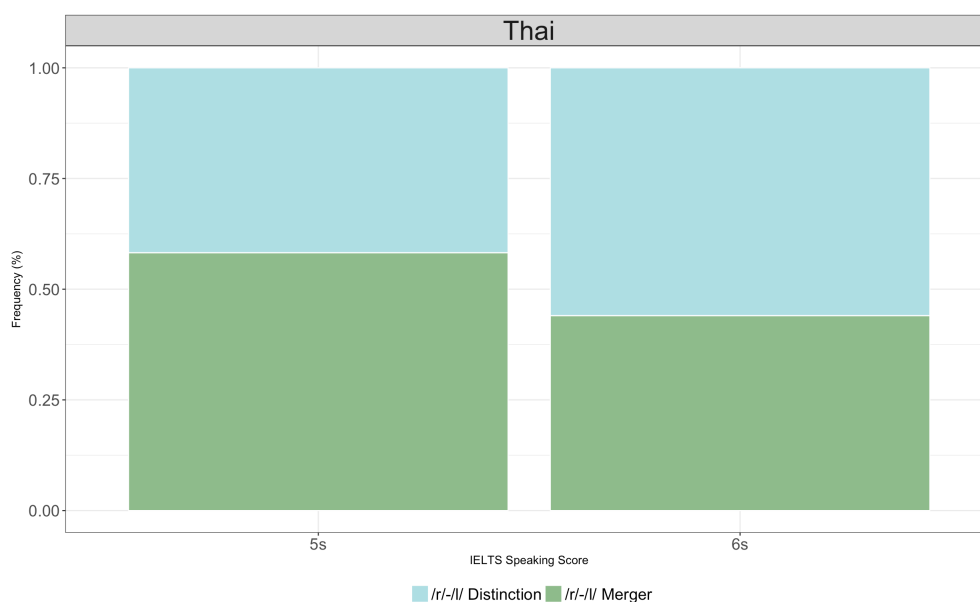


Figure 5.15: Thai prevocalic /r/: the merger of /r/ and /l/ according to IELTS speaking score

5.6 Summary

This chapter has described and interpreted the findings from the statistical analyses of the speech in relation to the research question 2), which investigates how linguistic and extralinguistic factors connect to the choice of a variant of /r/-/l/ merger in L1 Thai. Quantitative results based on the pronunciation of ten native speakers of Thai pronouncing the prevocalic /r/ in four tasks representing four different degrees of formality are assessed by use of the generalised mixed effects logistic regression. It is found that, according to the p-value of less than 0.05, the linguistic factor of preceding sound and the three interacting extralinguistic factors of age group, gender, and speech style are statistically significant predictors. The variables of syllable stress and IELTS speaking score are excluded from the model of best fit because these two factors do not contribute significantly to the variation or the choice of /r/-/l/ merger. Taking individual factors as sources of variation into account, the findings show that the prevocalic /r/ are more likely to alternate with /l/ or be deleted in the following situations: within an unstressed syllable, after a preceding consonant, in speakers aged in their 20s, in female speakers, in informal style of passage reading, and by speakers with IELTS speaking score of 5s. As seen in this chapter, the speakers produced the lateral [l] as the predominant variant. It seems to be the case in Thai that the phonological modification of rhotics in favour of the lateral [l] occurs or there is a preference for unmarkedness. However, the use of the standard trill [r] and flap [ɾ] as the second and third most preferred sounds suggests that native speakers of Thai still want to preserve standard features. The next chapter attempts to explain the distributional patterns observed in L2 English.

Chapter 6. Results and Interpretation

Quantitative Analysis of Variation: English

6.1 Introduction

This chapter aims to answer all four research questions. The research questions 1), 1.1), and 1.2) are based on the Eckman's (1977) Markedness Differential Hypothesis (MDH). The first question explores whether or not the MDH is able to explain the errors subjects make in learning L2 English. The research question 1.1) examines whether the patterns of acquisition and the difficulties associated with certain forms correspond to the markedness relations between L1 and L2. The research question 1.2) investigates which features are more likely to be transferred to L2 English in order to find out how markedness and transfer interact in the L2 acquisition of the prevocalic /r/. This will help to make clear which effect, markedness or transfer, prevails in learning L2. The research question 2) considers how the variable linguistic form of /r/-/l/ merger in L2 English is constrained by multiple linguistic (syllable stress and preceding sound) and extralinguistic (age, gender, speech style, and IELTS speaking score) factors.

In this chapter, the findings are reported in eight main sections. The first section, Section 6.2, explains the general findings concerning the variants found in the light of individual speakers. The second section, Section 6.3, shows acoustic spectrographic analysis. Section 6.4 compares an overall distributional pattern of the prevocalic /r/ variants in L1 Thai and L2 English in order to answer the research questions 1) and 1.1). This section will thus demonstrate whether or not the MDH is valid in being able to predict or explain speech production by subjects. The fourth topic in Section 6.5 explores allophonic variations from the perspectives of markedness and transfer to investigate an interaction of markedness and transfer. Section 6.6 deals with implicational markedness. In the sixth section, Section 6.7, the statistical significance of the best-fit model, as determined by the generalised mixed effects logistic regression, is analysed to demonstrate the relationship between the multiple factors involved and a categorical dependent variable or the binary variants. The statistical analysis will then show how many factors are statistically significant. Section 6.8 demonstrates the results in terms of interacting factors of age group and speech style to show the relationship of these two factors. The eighth section, Section 6.9, focuses on individual sources of variation to illustrate how each of these six factors affects the variants. The frequencies of rates of production found for each factor are illustrated in the form of a table of percentages followed by graphical representation.

The next section explains overall distribution of pronunciation according to individual speakers.

6.2 Overall distribution of the prevocalic /r/ by speakers

Figure 6.1 shows the results of the statistic analysis which was used to categorise individual natives of Thai producing prevocalic /r/ in L2 English into groups or nodes. In the top division, there are two main groups depending on the variants selected: either the predominant users of the standard approximant [ɹ] on the left branch 2, including speakers F, J, M, N, PC, and PK or L1 retention on the right branch 11 including speakers PA, PJ, PP, and TP. The second division of the left branch 2 was then split into two branches: the left branch 3 is composed of speakers F, J, N, PC, and PK, while the right branch, node 10, consists only of speaker M, the predominant user of the English approximant [ɹ], followed by the prestigious standard Thai trill [r]. It is worth noting that speaker M shows significant use of the standard /r/ in both L1 Thai and L2 English. That is, this speaker predominantly use the prestigious standard trill [r] and standard approximant [ɹ] when pronouncing the prevocalic /r/ in L1 Thai, as shown in Section 5.2 of Chapter 5, and L2 English respectively. Moreover, the standard trill [r] of Thai is selected as the second most preferred variant, followed by standard Thai flap [ɾ], when acquiring English /r/. Thus, it appears that speaker M is less likely to show the tendency towards the merger of /r/ and /l/ in both L1 and L2 acquisition.

The second level of the right branch 11 is classified into two further branches: the left branch 12 consisting of speakers PA and TP as well as the right branch PJ and PP, who both were finally placed in node 15 as predominant users of the non-standard Thai lateral [l]. The third division of the left branch 4 is composed of two groups, firstly, F and J in node 5 who exhibited the approximant [ɹ] as the predominant variant much more often than the use of the lateral [l], and, secondly, group N who extensively selected the approximant [ɹ] followed by deletion [Ø] in node 6. In contrast, the right branch 7 includes speaker PK in node 8 and PC in node 9 who both chose the approximant [ɹ] slightly more often than the flap [ɾ], followed by the lateral [l]. The third division of the right branch 12 includes two speakers in different nodes, TP in node 13 and PA in node 14, as the predominant users of /r/ omission [Ø].

As can be seen, three groups of speakers are classified according to their predominant use of the approximant [ɹ], deletion [Ø], and lateral [l] features. The data was then classified into eight further classes consisting of nodes labelled 5, 6, 8, 9, 10, 13, 14, and 15. The p-values of less than 0.05 from the statistical analysis suggest that the pronunciation patterns of the speakers in each node were significantly different. Interestingly, there were no speakers

who were close to categorical speakers of any variants in English, and this was possibly because L1 transfer effect had played a role in learning the L2 of the prevocalic /r/.

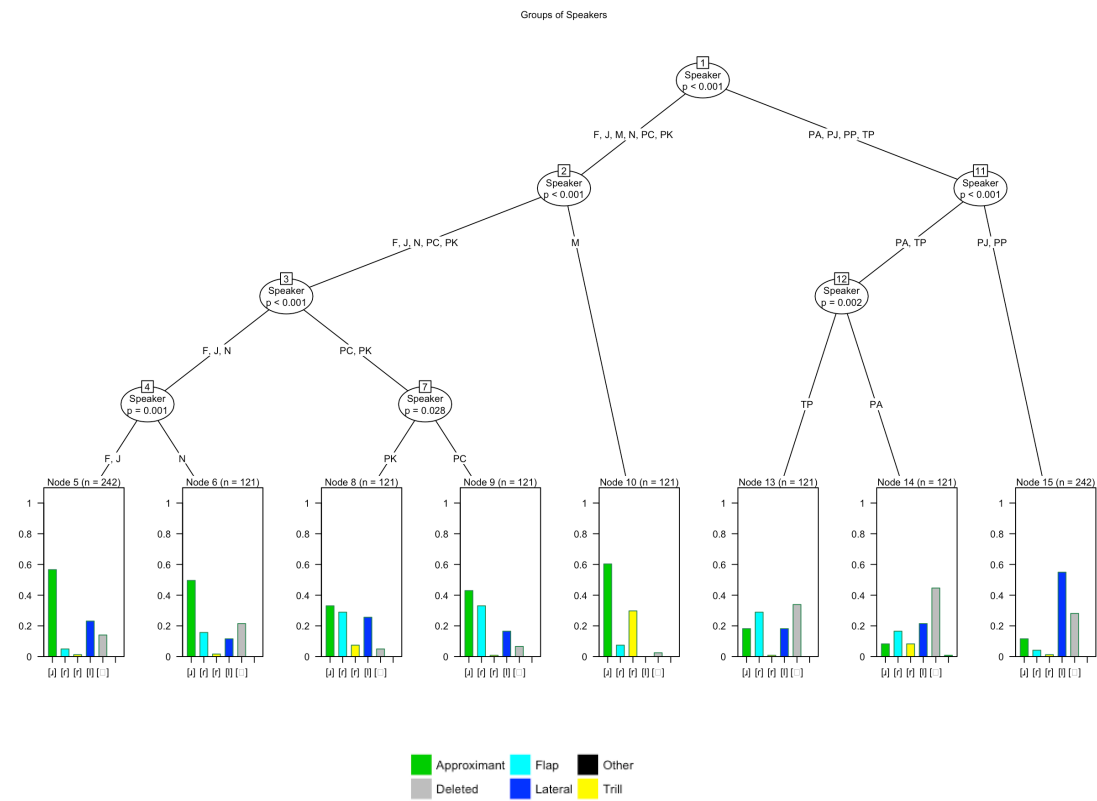


Figure 6.1: Distribution of English prevocalic /r/ variants according to speaker

Figure 6.2 below compares the distributional patterns of an individual speaker in L1 Thai and L2 English. The prevocalic /r/ in word-list and minimal pair reading tasks was read five times, so the figure shows how the same speakers generally produce prevocalic /r/ five times together with the sixth time, coded as NA, for non-repeated tasks of naming pictures and reading a passage. For example, for speaker F, F1 is the first time this speaker read the word-list and minimal pair task, followed by F2, F3, F4, and F5 as the second, third, fourth, and fifth repetitions of these two tasks. With regard to NA, the proportion shows speaker F's oral production in non-repeated tasks of naming a picture and reading a passage. It is shown that two native speakers of Thai, speakers F and M, are respectively near categorical users of the lateral [l] and the trill [r] in L1 Thai. Although the frequencies of trill [r] production for speakers M, PP, and J were higher than for the other seven speakers, the mixed effects regression analysis has already shown a random effect for all speakers. That is, if any speakers' oral production were strange, the random-effect factor for individual speakers would take the particular pronunciation into account and analyse the data precisely. In L2 English, speaker PJ showed the highest production of the lateral [l], while other subjects exhibited sound variation by displaying a wider range of variants. Interestingly, the informants were more categorical in L1 Thai but more variable in L2 English suggesting that the speakers were more stable in L1 acquisition. The distributional variability of the prevocalic /r/ in L1 Thai is thus smaller than in L2 English.

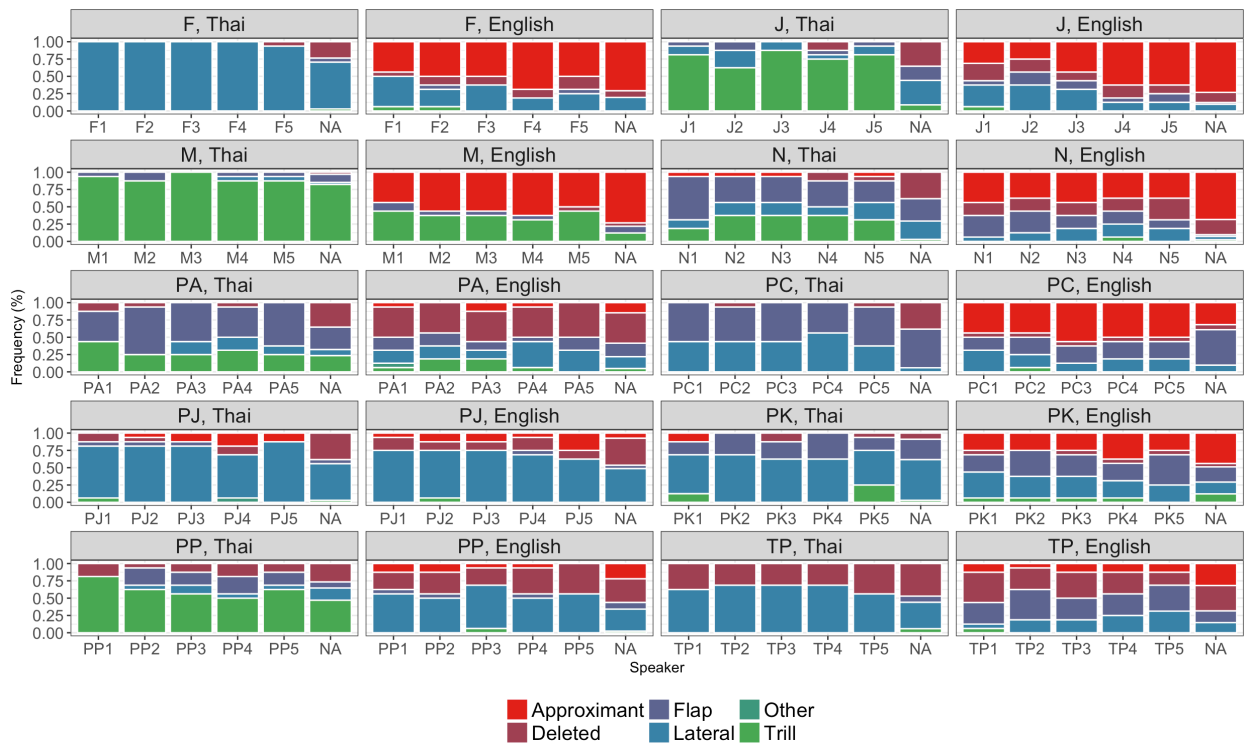


Figure 6.2: Distribution of Thai and English prevocalic /r/ variants according to speaker

6.3 Acoustic spectrographic analysis

Figure 6.3 illustrates the speech production of speaker M, who showed the most frequent use of the prestigious trill [r] in L1 Thai. This speaker produced the lateral [l] and transferred the Thai trill [r] to L2 English when respectively producing the words ‘lay’ and ‘ray’. There were two contacts of the tongue forming the initial trill [r] for ‘ray’.

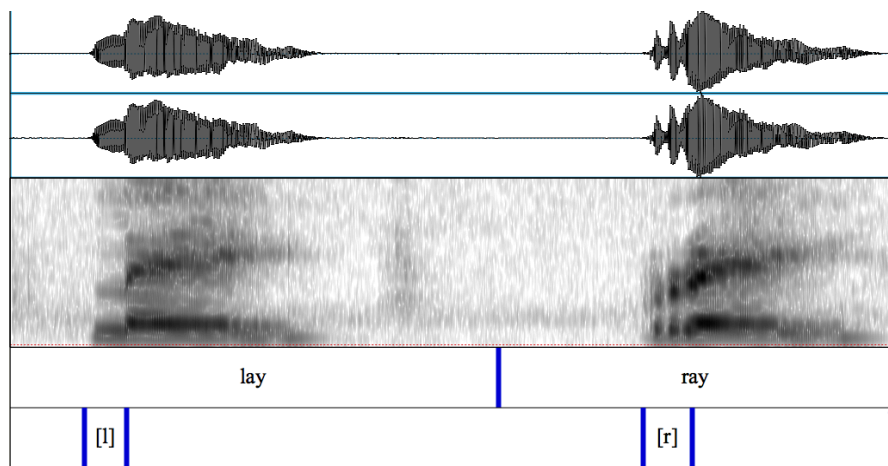


Figure 6.3: Spectrograms of the words ‘lay’ and ‘ray’, produced as [leɪ] and [reɪ] by speaker M during the English session.

Figure 6.4 demonstrates the oral production of speaker PA for the word /rū:an/ ‘house’. Spectrogram shows a single tap of the tongue in an initial /r/ to form the flap [r] for [rū:an].

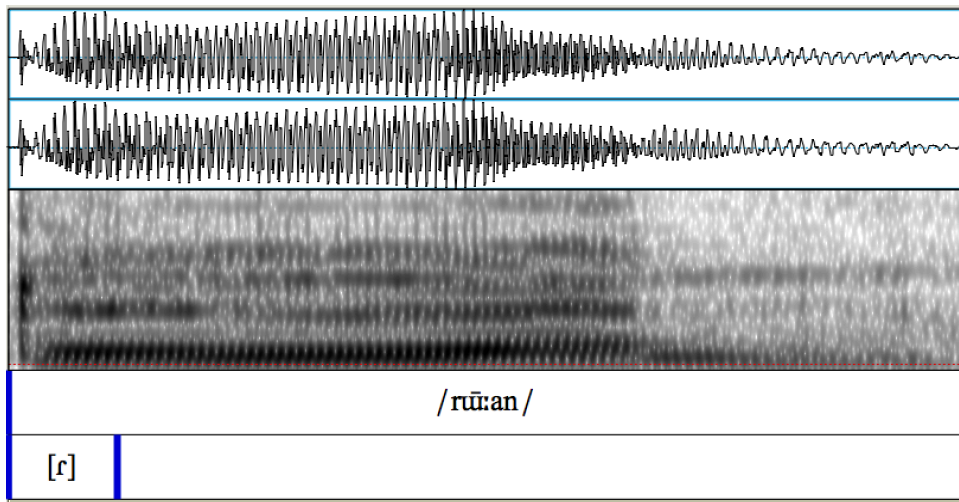


Figure 6.4: Spectrogram of the word /rū:an/ ‘house’ produced as [rū:an] by speaker PA during the Thai session.

As seen in the two figures below, speaker F completely merged /r/ and /l/ for the words /rā:/ ‘fungus’ and /lā:/ ‘donkey’ in the Thai session, as shown in Figure 6.5, together with ‘lay’ and ‘ray’ in the English session, shown in Figure 6.6. For the Thai session, the F1 and F2 of the word /rā:/ ‘fungus’ was darker or more clearly visible than those of /lā:/ ‘donkey’.

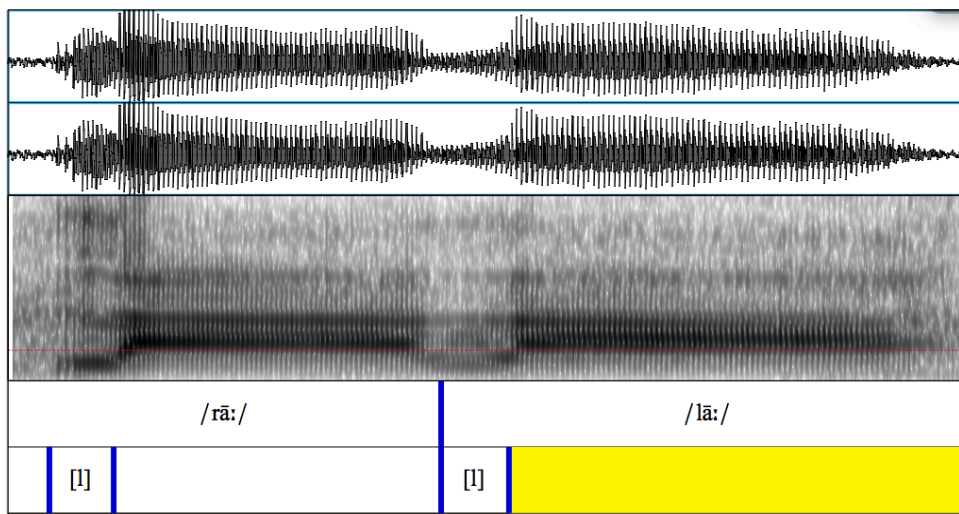


Figure 6.5: Spectrogram of the word /rā:/ and /lā:/ both produced as [lā:] by speaker F during the Thai session.

It is worth repeating that, as illustrated in Figure 6.2, which compares the oral production of ten speakers in two languages, speaker F dramatically decreased the use of /r-/l/ merger when learning L2 English. However, /l/ substitution for /r/ still existed; for example, the initial /r/ of ‘ray’ was pronounced as [leɪ]. The spectrogram in Figure 6.6 indicates that formants of the laterals of these two words showed clearly distinct locations from those in the following

vowels. The F2 of [ɪ] of the word ‘lay’ was more clearly visible than that of the latter word ‘ray’.

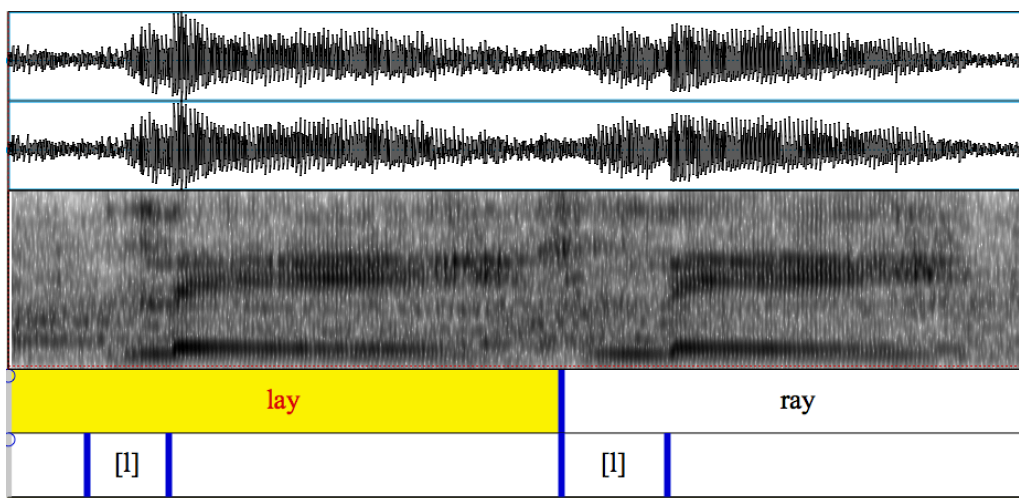


Figure 6.6: Spectrogram of the words ‘lay’ and ‘ray’ both produced as [leɪ] by speaker F during the English session.

As illustrated in Figure 6.7, it seems to be the case that the spectrogram did not noticeably show a clear distinction between the forms of /r/. An initial /r/ for ‘road’ produced by speaker M might be most suitably considered as an approximant [ɹ] because there is no tap of the tongue. For this reason, it was not considered as a flap [ɾ] or trill [r̄]. Moreover, there was a slight decrease in F3 showing a small tongue movement to form this initial approximant [ɹ]. This low F3 was thus used to determine this ambiguous case.

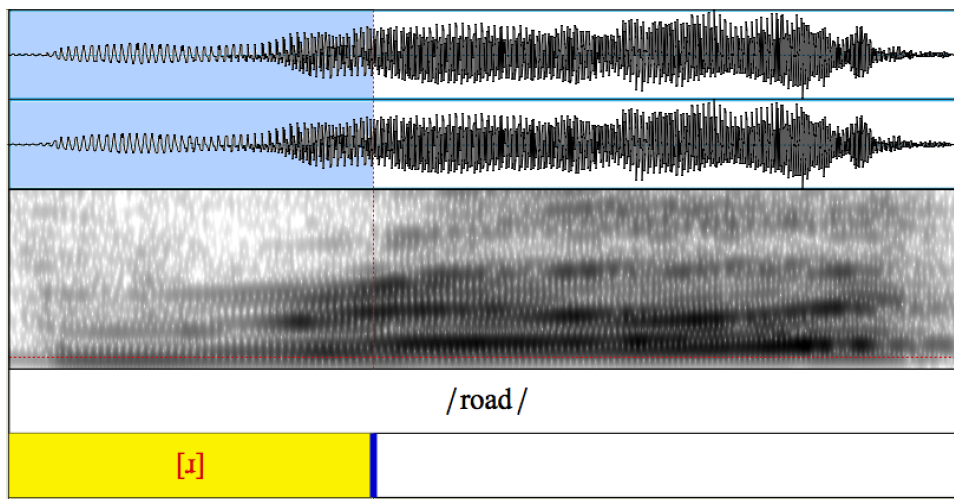


Figure 6.7: Spectrogram of the word ‘road’ produced as [ɹəʊd] by speaker M during the English session.

6.4 Overall distribution of the prevocalic /r/ by languages

This section aims to answer the research questions 1) and 1.1) to demonstrate the validity of the MDH. The markedness hierarchy in the present study is based on the cross-linguistic typology suggested by Maddieson (1984), as discussed in Section 3.2.3 of Chapter 3. Because substitution of [l] for /r/ can occur in both initial and initial cluster positions while the deletion [Ø] takes place only in initial cluster, this section focuses only on the markedness hierarchy of consonant inventory of the liquids. For this reason, markedness hierarchy of syllable structure according to an implicational hierarchy (Greenberg 1978), which suggests that a cluster of length N in a language implies clusters of length N-1 associated with /r/-cluster deletion [Ø], is not taken into account. The markedness hierarchy of the liquids is expressed on the following continuum, where the most marked is at the left-hand edge:

approximant [ɹ] > flap [r] > trill [r] > lateral [l]

The MDH predicts that if the features or structures in L2 were different from and more marked than those in L1, the L2 learners would have difficulties in acquiring those features or structures. For this reason, to support the MDH, it is expected that the standard rhotic in L2 English, the approximant [ɹ], which is more marked than the flap [r], trill [r], and lateral [l] as well as deletion [Ø] used in L1 Thai is more difficult and thus less frequently pronounced when native speakers of Thai acquiring L2 English.

The findings concerning the use of the prevocalic /r/ in L2 English were extracted from 1210 tokens. Table 6.1 below illustrates the variants used in L1 Thai and L2 English regardless of linguistic and extralinguistic factors. The most preferred variants in L1 Thai and

L2 English were used at the similar rates. That is, in L1 Thai, the lateral [l] was selected at a rate of 37.17%, while the approximant [ɹ] was employed in L2 English at a lower rate of 34.88%. Likewise, the second most preferred variants in two languages included the trill [r] in L1 Thai and the lateral [l] in L2 English, which were adopted respectively at 26.58% and 24.96%. The standard Thai flap [ɾ] was produced in Thai at 20.96%, higher than in English, at 14.88%. The speakers deleted /r/ cluster in L1 Thai less frequently than in L2 English, at 13.95% and 19.83% respectively. With regard to the least preferred variants, the prestigious Thai trill [r] was realised in L2 English at 5.37%, while the standard English approximant [ɹ] was found to be used in Thai at 1.23%.

Realisation	Thai (1140)	English (1210)
Approximant [ɹ] (N)	1.23% (14)	34.88% (422)
Flap [ɾ] (N)	20.96% (239)	14.88% (180)
Trill [r] (N)	26.58% (303)	5.37% (65)
Other (N)	0.09% (1)	0.08% (1)
Lateral [l] (N)	37.19% (424)	24.96% (302)
Deleted [Ø] (N)	13.95% (159)	19.83% (240)

Table 6.1: Distribution of the prevocalic /r/ variants according to language

To examine the research question 1) of whether the MDH was able to predict and explain the difficulties L2 learners have in acquiring English /r/, overall speech production in L2 English was found to support the MDH. The speakers tended to replace the English approximant [ɹ] with the variants which were less marked and allowed in L1 Thai. The different percentages of the approximant [ɹ] production between L1 Thai and L2 English were on the increase of 33.65%. Although the use of the English approximant [ɹ] increased from 1.23% in L1 Thai to 34.88% in L2 English, the English approximant [ɹ] was produced approximately one-third of the time from the overall production of the five major variants. According to the PAM-L2 (Best and Tyler 2007), L2 Thai learners possibly do not match the

English /r/ with the native Thai /r/ in perception, which then results in the successful production of English /r/ when learning L2.

In other words, the majority of the features used in acquiring the prevocalic /r/ in L2 English were those less marked variants transferred from L1 Thai. This might suggest that, though the acquisition of the prevocalic /r/ in L2 takes place or develops, L2 Thai learners of English still have difficulties with acquiring the prevocalic /r/ in English due to the larger proportion of other four variants. The MDH thus could predict the difficulties L2 Thai learners have in learning the prevocalic /r/ in English. In this way, the speakers showed a preference towards the unmarked features of the lateral [l], which was produced more frequently than the more marked flap [ɾ] and trill [r]. Similar findings were evident in Osborne's (2010) study, in which Brazilian speakers had difficulty in learning the more marked /r/ in English, as predicted by the MDH. In the initial cluster position, the English [ɹ] was realised as the flap [ɾ] approximately two-thirds of the time, while the rates of approximant [ɹ] production were nearly one-third of the time. One instance of /r/-cluster deletion occurred in 'country'. According to Osborne, given that the flap [ɾ] is allowed in the initial cluster in L1 Brazilian Portuguese (BP), the predominant use of the flap [ɾ] was attributed to phonological transfer from L1 when learning English. In addition to the MDH, it might be the case in the present study that the more frequent use of the lateral [l] follows Flege's (1995) SLM, which suggests that more similar sounds in the two languages result in more difficulty. Accordingly, the most different variant, the lateral [l], from the target /r/ in the L2 is found to be realised more frequently than the similar flap [ɾ] and trill [r]. Within the liquids, it seems that the more similar and more marked sounds, the approximant [ɹ], flap [ɾ], and trill [r], are more acceptable than the more different and less marked realisation [l] because the rhotics share the similar phoneme /r/.

The research question 1.1) explored whether the patterns of acquisition and the difficulties correspond to the markedness relations between L1 and L2. According to the MDH, the difficulty hierarchy is related to the degrees of markedness. The unmarked features are less difficult and acquired earlier than the relatively more marked features. It is thus predicted in the present study that the L2 Thai learners of English would produce the lateral [l] at a higher rate, followed by the trill [r], the flap [ɾ], and the approximant [ɹ], which is most marked according to the markedness hierarchy in terms of a cross-linguistic typology of liquids proposed by Maddieson (1984).

As seen in Figure 6.8, the prevocalic /r/ contributes to the distributional pattern of five main variants, including the approximant [ɹ], deletion [Ø], flap [ɾ], lateral [l], and trill [r]. It was found that the common variants selected in L1 and L2 were different. That is, the predominant variants of the prevocalic /r/ in L1 Thai and L2 English were respectively the lateral [l] and approximant [ɹ]. It should be noted again that the flap [ɾ] and trill [r] were standard Thai rhotics, while the lateral [l] and deleted [Ø] variants were the non-standard features. In L2 English, the approximant [ɹ] is regarded as the standard rhotic. As can be seen, in L2, the frequency of use of standard Thai rhotics of the flap [ɾ] and trill [r] as well as lateral [l] decreased, whereas the deletion of /r/ as a cluster member increased. In this regard, the emerging L2 phonological repertoire of the approximant [ɹ] as the predominant variant is indicative of L2 learning development. To put it simply, patterns of speech production in L2 English show that native speakers of Thai are moving towards successful L2 learning by increasing the production of the standard English approximant [ɹ]. This corroborates the conclusion of Chunsuvimol (1993), who found that native speakers of Thai expressed the standard English approximant [ɹ] approximately twice as often as variants transferred from L1 Thai when acquiring the prevocalic /r/ in L2 English. In terms of cluster omission [Ø], it was found by Chunsuvimol (1993) that /r/ was considerably preserved when the learners pronounced prevocalic /r/ in L2 English, with the /r/ retention rates of 20.4% in L1 Thai and 64.8% in L2 English. This went against an increasing rate of /r/-cluster deletion [Ø] in L2 English in the present study, presented in Table 6.1 above.

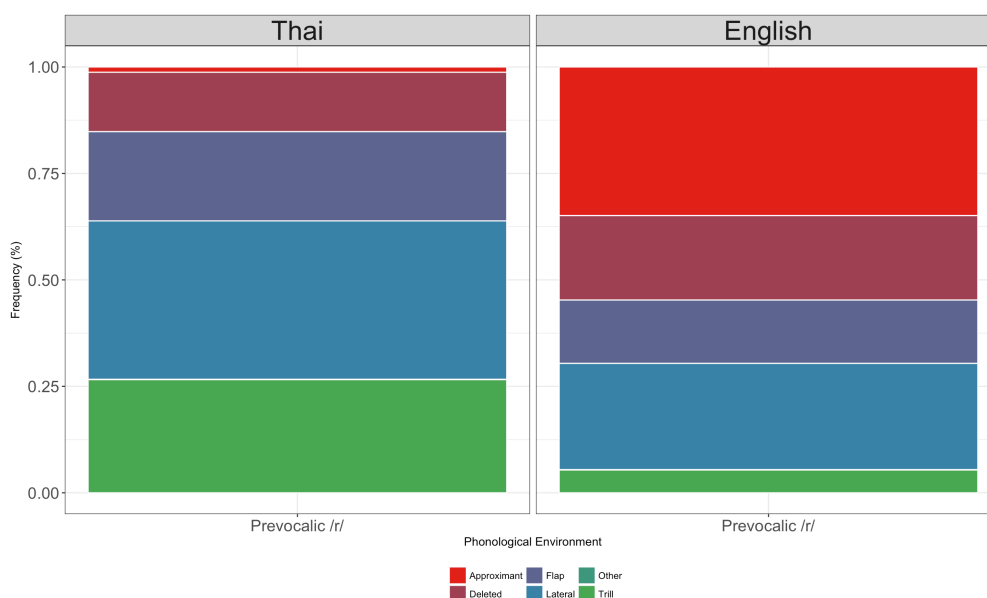


Figure 6.8: Distribution of prevocalic /r/ variants according to language

To answer the research question 1.1) of whether the patterns of acquisition and the difficulties associated with certain forms correspond to the markedness relations between L1 and L2, the continuum below compared expected and actual results. The order of the variants in ‘expected’ and ‘actual’ results, with higher level of difficulty on the left, is expressed on the scale below.

expected results: approximant [ɹ] > flap [ɾ] > trill [r] > lateral [l]

actual results: trill [r] > flap [ɾ] > lateral [l] > approximant [ɹ]

As can be seen, the results showed that the level of difficulty in L2 learning did not correspond to the relative degree of markedness. The ‘actual’ results are seen to differ from those which were expected. This was because the approximant [ɹ], which was regarded as the most marked feature due to its infrequent distribution according to Maddieson (1984), was found to be used at the highest rate in comparison with the other four variants used in L1 Thai. In the present study, the lateral [l], considered the least marked feature, was selected as the second most preferred variant. The lower rate of the lateral [l] production than the approximant [ɹ] did not accord with Pye *et al.* (1987) and Ingram (1989), who suggested that the English /l/ is acquired earlier than the approximant [ɹ] rhotic. Moreover, Núñez-Cedeño (2016) found that, in Spanish acquisition, monolingual children had more difficulty in producing /r/ than /l/ in an initial cluster. The present study also found that the trill [r] which was less marked than the flap [ɾ] turned out to be adopted less frequently than the flap [ɾ]. This is not surprising, because the trill [r] was used only in formal contexts or emphatic

speech in Thai, while the flap [ɾ] was commonly produced in normal situation. For this reason, the learners' performance in acquiring the prevocalic /r/ in L2 English did not reflect the hierarchy of difficulties in acquiring the liquids predicted by the MDH.

An investigation of the interaction of markedness and transfer to answer the research question 1.2) is the focus of the next section.

6.5 Interaction of markedness and transfer

This section answers the research question 1.2) of how markedness and transfer interact in the L2 acquisition of the prevocalic /r/. It explores which features are more likely to be transferred to L2 English. It may be expected that the use of standard variants in L1 Thai and L2 English will not follow the same pattern because transfer from the L1 will take place. In relation to Lado's (1957) Contrastive Analysis Hypothesis (CAH), difficulties in L2 acquisition should be traceable to L1. The different features or structures in the L1 and L2 lead to errors due to negative transfer, while success is attributed to positive transfer arising from the similarities between the two languages. For this reason, the variants used in the L1 will be transferred when the speakers learn an L2. According to the Markedness Differential Hypothesis (MDH) proposed by Eckman (1977), more marked features or structures in L2 will lead to learning difficulties. L1 transfer of unmarked variants occurs when the features in L2 are more marked than those in L1. In addition, unmarked features or structures will be easier and acquired earlier than comparatively marked variants. It is worth noting that the standard rhotics of Thai are the flap [ɾ] and trill [r] whereas, in English, the approximant [ɹ] is used as the standard rhotic. The phonological process of [l] and, in the initial cluster, [Ø] substitution for /r/ prevocalically in L1 Thai is possibly evidence of the modification towards unmarked because the lateral [l] and deletion [Ø] are considered less marked than the rhotics. For this reason, it is expected that the unmarked [l] and deleted [Ø] variants, which are less marked and thus are acquired earlier, are more likely to occur in L2 than are the standard Thai rhotics, the flap [ɾ] and trill [r]. In other words, the prevocalic /r/ in L2 English should be modified towards the less marked features.

Grouping the realisations into three major groups to answer the research question 1.2) of which effect - markedness or transfer - overrides in L2 acquisition, Table 6.2 lists the sound production of marked and unmarked variants in two languages. In this sense, the lateral [l] and deleted [Ø] variants are less marked than the rhotics which differ in L1 Thai and L2 English in relation to the standard status. It should be noted again that the lateral [l] and deletion [Ø] are grouped together because, firstly, deletion [Ø] can occur only in initial

cluster, as in [k̄ɔ̄:ŋ] for /kr̄ɔ̄:ŋ/ ‘to filter’, while substitution of [l] for /r/ occurs in both initial, as in [l̄a:] for /r̄a:/ ‘fungus’, and initial cluster positions, as in [kl̄ɔ̄:ŋ] for /kr̄ɔ̄:ŋ/ ‘to filter’. However, an investigation of prevocalic /r/ in the present study refers to /r/ in both initial and initial cluster positions together, so the lateral [l] and deletion [Ø] are grouped together as unmarked features in comparison with the rhotics in a single prevocalic position. The second reason to group these two features in a single group is that both lateral [l] and /r/-cluster deletion [Ø] are associated with the phonological process of /r/-/l/ merger in Thai in both initial and initial cluster positions.

As evidenced, the native speakers of Thai showed the highest production of the unmarked lateral [l] and /r/-cluster deletion [Ø] in L1 Thai and L2 English at the comparable rates of 51.14% and 44.79% respectively. The marked flap [ɾ] and trill [r] regarded as the standard rhotics in Thai were employed in L1 Thai approximately twice as often as in L2 English. That is, the subjects selected the marked flap [ɾ] and trill [r] at 47.54% in Thai and 20.25% in English. The marked approximant [ɹ], which is standard English rhotic, was extensively more frequently used in L2 English, at 34.88%, than in L1 Thai, at 1.23%.

Realisation	Thai (1140)	English (1210)
Marked approximant [ɹ] (N)	1.23% (14)	34.88% (422)
Marked flap [ɾ] and trill [r] (N)	47.54% (542)	20.25% (245)
Unmarked [l] and deletion [Ø] (N)	51.14% (583)	44.79% (542)
Other (N)	0.09% (1)	0.08% (1)

Table 6.2: Distribution of marked and unmarked prevocalic /r/ variants according to language

Figure 6.9 represents the percentages in Table 6.2 in the form of graphical representation, which compares rates of marked and unmarked production of prevocalic /r/ in L1 Thai and L2 English. Again, the realisations are grouped into three categories, including unmarked [l] and deletion [Ø], marked flap [ɾ] and trill [r], and marked approximant [ɹ]. As evidenced in the results, the role of markedness was more prominent in L1 Thai than in L2 English, wherein negative transfer was inhibited and L2 acquisition development takes place.

That is to say, the modification towards the unmarked exerted a greater influence on speech production in L1 Thai than in L2 English.

Interestingly, with the variants transferred from L1 Thai, the unmarked [l] and deleted [Ø] variants were produced in the L2 at higher rates than the more marked and standard Thai rhotics of the flap [ɾ] and trill [r]. As for the standard approximant [ɹ] in L2 English, the participants targeted the standard /r/ in English and thus expressed the approximant [ɹ] considerably more frequently in L2 English than in L1 Thai. It seems that the speakers were conscious of the differences in the rhotics in the two languages, using the standard form in each language quite accurately.

Although the noticeable shift from Thai to English standard rhotics is clear in Figure 6.8 above, the total percentages in Figure 6.9 of approximant [ɹ] selection in L2 English were lower than for the unmarked variants of lateral [l] and deletion [Ø] transferred from L1 Thai. This might suggest that though the acquisition of the prevocalic /r/ in L2 takes place, learners possibly still have difficulties in producing the prevocalic /r/ in both L1 and L2 resulting in the highly frequent use of the unmarked variants. To answer the research question 1.2), although the effect of both L1 transfer and markedness still constrain L2 acquisition, the effect of markedness prevails as shown in the largest proportion of unmarked pronunciation in Figure 6.9. The findings seem to disconfirm Seubsunk's (1999) investigation of stop-liquid and stop-glide clusters in word-initial position among L2 Thai learners of English and found that the Language Transfer theory was able to account for the errors subjects made in learning L2 English better than the MDH. In relation to the MDH hypothesis, if the features in L2 are more marked than those in L1, L1 transfer of less marked variants will take place. Moreover, the less marked features are more likely to be easier and thus acquired before the relatively more marked features. The speech production shown in Figure 6.9 confirms the MDH due to the production of unmarked features over marked rhotics in the L2 English.

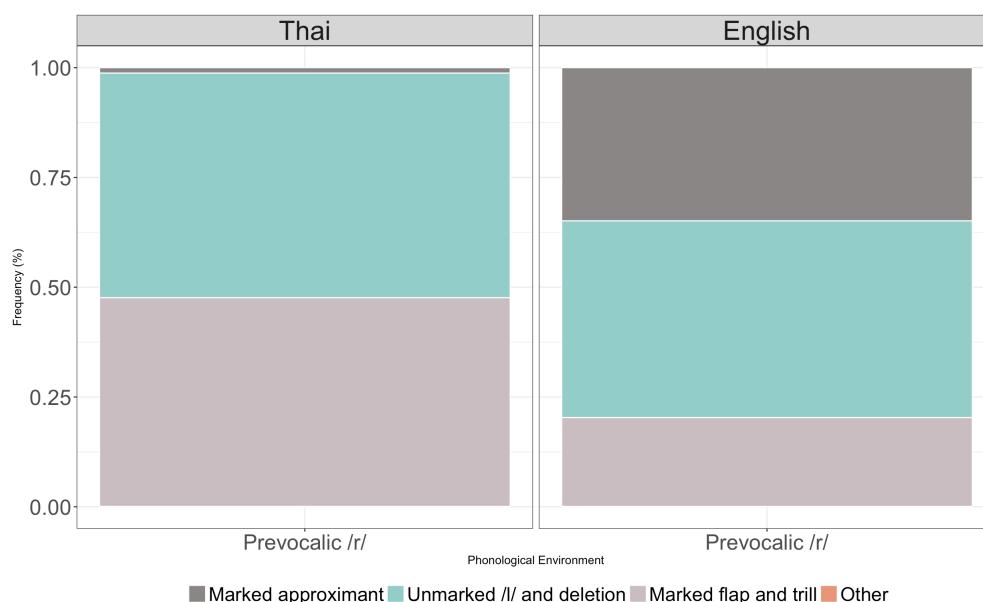


Figure 6.9: Distribution of marked and unmarked prevocalic /r/ variants according to language

In the next section, the results from mixed effects regression analysis, which is performed to measure statistical significance, are explained.

6.6 Implicational markedness

In this section, the results of the oral production of /r/ in both L1 Thai and L2 English will be divided into in initial and initial cluster positions. It should be noted again that, according to an implicational hierarchy (Greenberg 1978), a cluster of length N in a language implies clusters of length N-1. That is, the longer the clusters are, the more marked these clusters will be. In this sense, a cluster of length N is more marked than a cluster of length N-1, so the /r/ will be modified more frequently in an initial cluster than in the initial position. As shown in Table 6.3, in L1 Thai, the predominant variant in both the initial and initial cluster positions is the lateral [l], which was chosen respectively at 41.75% and 32.63%. In L2 English, an initial position occurred with the approximant [ɹ] most often, at 42.25%. The /r/ omission [Ø] only occurred in the initial cluster, and this happened in 27.89% of cases and, as the most preferred variant, in 40% of cases in the L1 and L2 respectively.

Realisation	Thai		English	
	Initial /r/ (Total 570)	Initial cluster /r/ (Total 570)	Initial /r/ (Total 610)	Initial cluster /r/ (Total 600)
Trill [r] (N)	30.53% (174)	22.63% (129)	5.57% (34)	5.17% (31)
Flap [ɾ] (N)	25.26% (144)	16.67% (95)	17.70% (108)	12% (72)
Approximant [ɹ] (N)	2.28% (13)	0.18% (1)	45.25% (276)	24.33% (146)
Other (N)	0.18% (1)		0.16% (1)	
Lateral [l] (N)	41.75% (238)	32.63% (186)	31.31% (191)	18.50% (111)
Deleted [Ø] (N)		27.89% (159)		40% (240)

Table 6.3: Distribution of English prevocalic /r/ variants according to phonological context

It is shown in Figure 6.10 below that the trill [r] and lateral [l] were used in L1 Thai in noticeably larger proportions than in L2 English, wherein the approximant [ɹ] turned out to be pronounced considerably more often. The deletion [Ø] was also produced in English more frequently than in Thai. In the less marked context of initial position, native speakers of Thai showed the higher rate of the lateral [l] production in L1 Thai than in L2 English, wherein the approximant [ɹ] was selected at a similar rate as the L1 lateral [l] production. This might thus suggest that, in L2 learning, the speakers became more conscious of using the target [ɹ], while in the initial cluster the use of the English approximant [ɹ] was selected less often than the deletion [Ø]. In L1 Thai, the speakers preferred to retain the cluster member of the lateral [l] than the deletion [Ø]; however, in L2 learning the deleted variant [Ø] turned out to be produced more frequently than the lateral [l].

Senawong (1992) reported that initial clusters had three variants, including full clusters, reduced clusters, and substitute clusters. The full initial cluster conformed to the standard form of Thai initial clusters preservation regarded as the prestigious variant, while reduced clusters were associated with the deletion [Ø] of the second consonant /l/ or /r/ in

initial clusters. The third variant was consonant substitution, referring to an alternation between /l/ and /r/. In Senawong's study, the results revealed the less likely replacement of /r/ for /l/ at 0.10%, relative to that of /l/ for /r/ at 7.14%.

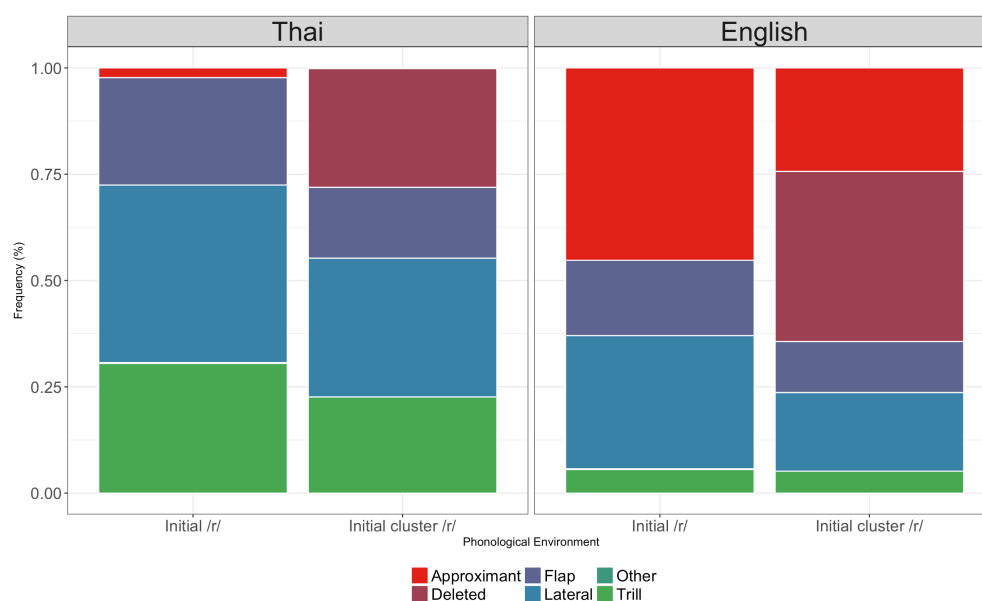


Figure 6.10: Distribution of Thai and English prevocalic /r/ variants according to phonological context

In terms of implicational markedness, the results illustrated in Figure 6.11 followed the prediction in the sense that the modifications towards unmarked [l] and deletion [Ø] were found to be more frequent in the more marked context of an initial cluster than in the initial position in both L1 Thai and L2 English. The results thus confirm that the speakers encountered more difficulty in pronouncing clusters of length N than of length N-1.

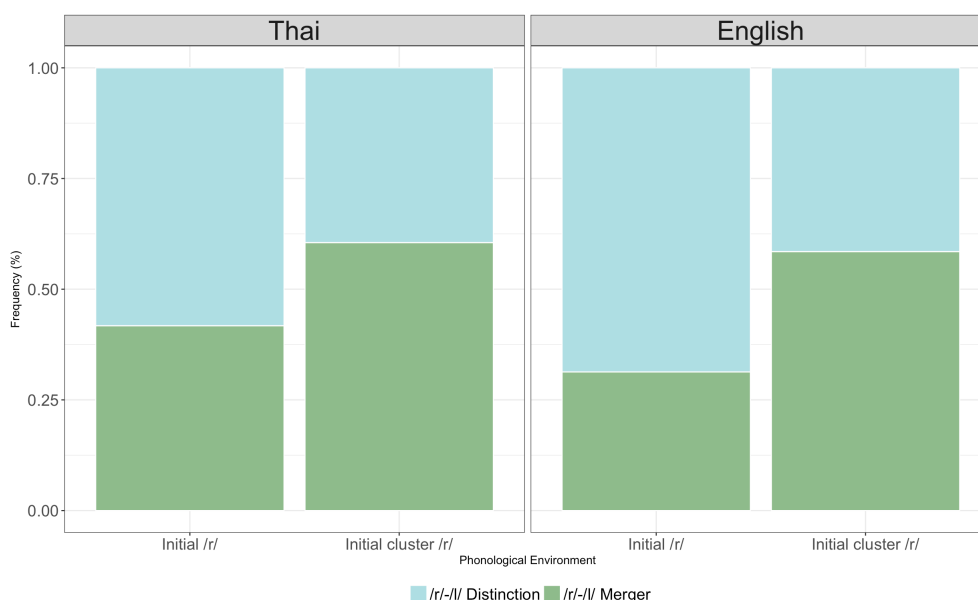


Figure 6.11: Thai and English prevocalic /r/: the merger of /r/ and /l/ according to phonological context

6.7 Statistical analysis

The mixed effect logistic regression analysis considered a total of 1210 observations of prevocalic /r/ which involved six parameters, including syllable stress, preceding sound, age group, gender, speech style, and proficiency as based on IELTS speaking score as fixed effects, and word and speaker as random effects. Similar to the coding of the binary variant in L1 Thai discussed in the previous chapter, ‘the distinction between /r/ and /l/’ was coded as ‘0’ and ‘merger’ as ‘1’; accordingly, the negative and positive estimates are described as tendencies towards /r/-/l/ distinction and /r/-/l/ merger respectively.

It was found that distinction and merger of /r/ and /l/ in L2 English were influenced by three factors, including one linguistic and interaction of two extralinguistic conditioning factors which proved to have statistically significant effects. Table 6.3 illustrates the results of the model of best fit from the generalised mixed effects logistic regression analysis whose p-values were less than 0.05, suggesting that changes in preceding sound, age group, and speech style were associated with changes in the use of /r/-/l/ merger as the response variable. The results for the other three predictor variables failed to reach significance and thus were excluded from the table.

As to the effect of a preceding sound, the p-value of less than 0.05 indicated that the effect of a preceding pause and a preceding vowel were significantly different from that of a preceding consonant in the baseline. The effects of a preceding pause and a preceding vowel were more likely to lead to the distinction between /r/ and /l/ than a preceding consonant, with

estimates respectively of -1.98 and -1.64. Speakers aged in their 20s reading a minimal pair in the baseline of interacting factors were likely to maintain the distinction between /r/ and /l/ both when /r/ followed a pause and a vowel, estimated respectively at -1.98 and -1.64. An interaction of age group and speech style, which was plotted in Figure 6.12, indicated that the effect of age group or speech style was not significant on its own. One predictor depended on the value of another predictor given that the effect of age group was significant in some speech styles.

	Estimate	Std. Error	z value	Pr(> z)	N
(Intercept)	-0.3358	0.8223	-0.408	0.683	
Preceding sound					
Preceding consonant (baseline)					600
Preceding pause	-1.9828	0.3731	-5.315	≤ 0.001 ***	460
Preceding vowel	-1.6406	0.555	-2.956	0.00311 **	150
Age group: speech style					
20s: reading a minimal pair (baseline)					200
20s: naming a picture	-0.9235	0.7728	-1.195	0.23208	30
20s: reading a passage	-0.2989	0.438	-0.683	0.49489	175
20s: reading a word list	0.3178	0.5528	0.575	0.56542	200
30s+: reading a minimal pair	2.2246	1.0473	2.124	0.03366 *	200
30s+: naming a picture	-1.1522	0.7823	-1.473	0.14077	30
30s+: reading a passage	-0.3452	0.396	-0.872	0.38344	175
30s+: reading a word list	-0.8282	0.3722	-2.225	0.02609 *	200

Table 6.4: The best model including number of tokens (N). Positive numbers reflect more merger, negative numbers reflect more distinction. Random effects of word (sd = 0.9902) and speaker (sd = 1.5917). AIC = 1176.7.

These three factors exerted significant effects on the likelihood of the /r-/l/ distinction and merger of the prevocalic /r/ in L2 English. Unlike L1 Thai, the gender was not shown to have impact on the choice of utterance in L2 English, which suggested that the social constraint of gender played role in L1 Thai was not transferred to the L2 English. In the next section, the distribution of speakers aged in their 20s and 30s+ varying their production of /r-/l/ merger in four speech styles is illustrated.

6.8 Interacting factors of age group and speech style

As can be seen in Table 6.3 above, the factors of age group and speech style failed to reach

statistical significance on their own; however, the model of best fit shows that an interaction of these two predictors made up a significant effect on the merger of /r/ and /l/ in L2 English. The effect of interacting factors of age group and speech style on the merger of /r/ and /l/ is shown in Figure 6.12. In general, speakers from two age groups demonstrated similar pattern in the merger of /r/ and /l/, with the higher rates of merger occurring when reading a minimal pair and a word list. This unexpected use of merger in the formal contexts of reading a minimal pair and a word list showed that speech style played a contrastive role when native speakers of Thai acquired L2 English. A possible reason offered was that, during the recording process, the order of tasks began with naming a picture (NP), followed by reading a passage (RP), reading a word list (WL), and finally reading a minimal pair (MP). Thus, it was possibly the case that the participants may have felt self-conscious undertaking the former tasks, so they greatly monitored their speech production and preserved the standard features. In the following more formal tasks, these speakers became more relaxed and decreasingly used the standard variants leading to increasing rate of non-standard expression. As a result, it is worth mentioning again that the task sequence might affect the speech production patterns found.

It was also surprising that speakers aged in their 20s were more likely to preserve the /r/-/l/ distinction than the counterparts aged 30s+. The possible explanation was that, despite the insignificant effect of IELTS speaking score, these younger speakers had more opportunities to learn English with native speakers of English in international schools or international programmes in universities in Thailand, which were quite scarce in the past, than older speakers. For this reason, these younger speakers used English approximant [ɹ] correctly resulting in increasing production of /r/-/l/ distinction. In addition, the younger speakers were possibly aware that substitution of [l] or /r/-cluster deletion [Ø] for prevocalic /r/ was more stigmatised in L2 English than in L1 Thai. As a result, they tried to avoid using the merger.

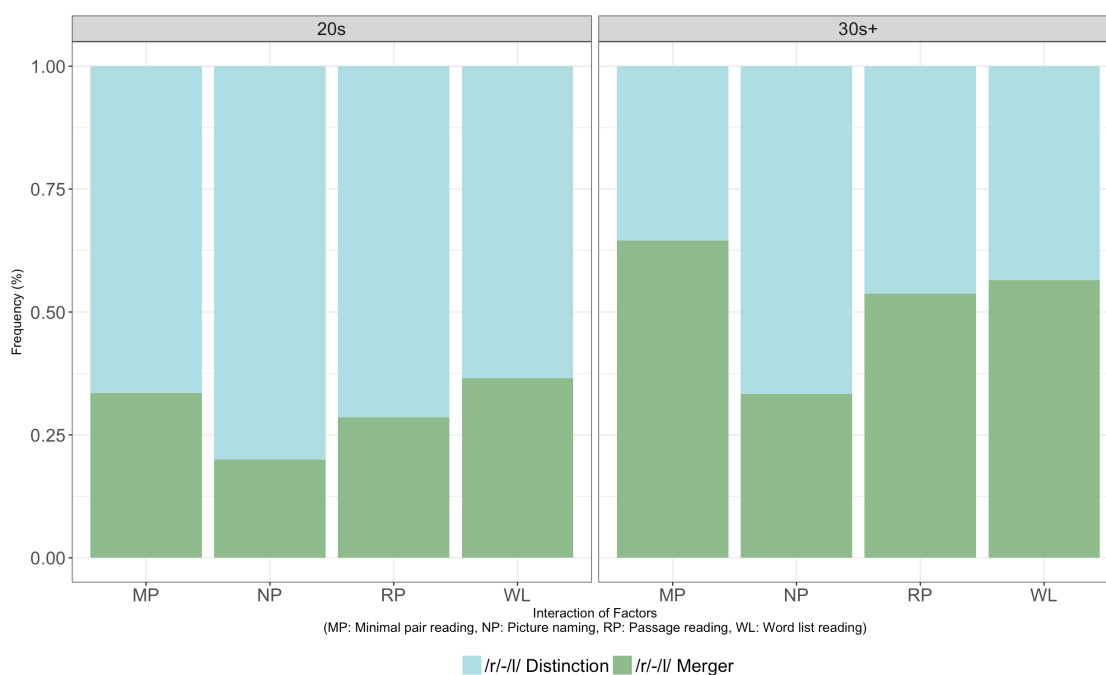


Figure 6.12: English prevocalic /r/: the merger of /r/ and /l/ according to age group and speech style

The next section focuses attention on how the six sources of variation behave in regard to the variable in L2 phonology.

6.9 Sources of variation

6.9.1 Syllable stress

The present study explores whether the tonal and stress pattern in Thai affect the speech production in L2 English. Although the stress pattern in L1 Thai and L2 English differs, the linguistic factor of syllable stress in the present study is based on the stress pattern of Thai rather than English. For example, the word ‘rabbit’, which is stressed on the first syllable in English, is regarded as being stressed on the final syllable in relation to the stress pattern in Thai. For this reason, the prevocalic /r/ in stressed syllables, such as in road and vary, and in unstressed syllables, such as in rabbit and characters, are analysed.

Based on the tonal neutralisation in unstressed syllables found in L1 Thai, it is thus predicted that the preservation of the distinction between /r/ and /l/ will increase with stressed syllables. Furthermore, this stress pattern might be transferred to L2 English acquisition as a result of the transfer effect. This is due to the fact that L2 learners are likely to transfer the features or structures from L1 to L2 to aid acquiring the L2. For example, with polysyllabic English words, Thai speakers have a tendency to stress the final syllable, according to the normal stress pattern of Thai pronunciation (Smyth 2001: 347). In the word ‘coffee’, native

speakers of Thai will tend to stress the final syllable ‘coffee’, so they can retain the lexical tone. In contrast, English pronunciation would place the stress on the first syllable ‘**co**ffee’. According to Narksompong (2007: 29), English loanwords are pronounced with the stress on final syllable, as in ‘computer’, by Thai speakers rather than ‘**com**puter’ in relation to stress pattern in English.

Analysis of the data reported in Table 6.4 indicates that, in both stressed and unstressed syllables, all variants are favoured at similar rates. The approximant [ɹ] employed at the highest rate was expressed in the stressed syllables at 34.65% and in unstressed syllables 35.43% of the time. In both types of syllables, the lateral [l] was adopted as the second most favoured variant in stressed syllables at 26.16% and in unstressed syllables at 22%. The deletion of /r/ occurred in stressed and unstressed syllables at 20% and 19.43% respectively. The prevocalic /r/ was realised as the flap [ɾ] in 13.6% of stressed syllables and 18% of unstressed syllables, while the trill [r] resulted for stressed and unstressed syllables at similar rates of 5.47% and 5.14% respectively.

Realisation		Syllable stress	
Variant	Binary variant	Stressed syllable (Total 860)	Unstressed syllable (Total 350)
Approximant [ɹ] (N)	Distinction	34.65% (298)	35.43% (124)
Flap [ɾ] (N)		13.6% (117)	18% (63)
Trill [r] (N)		5.47% (47)	5.14% (18)
Other (N)		0.12% (1)	
Lateral [l] (N)	Merger	26.16% (225)	22% (77)
Deleted [Ø] (N)		20% (172)	19.43% (68)

Table 6.5: Distribution of English prevocalic /r/ variants according to syllable stress

As illustrated in Figure 6.13, native speakers of Thai showed a similar pattern in the three types of English stress although the use of the English approximant [ɹ] was slightly lower in

unstressed syllables. As a result, the speech production was not very much constrained by English stress patterns.

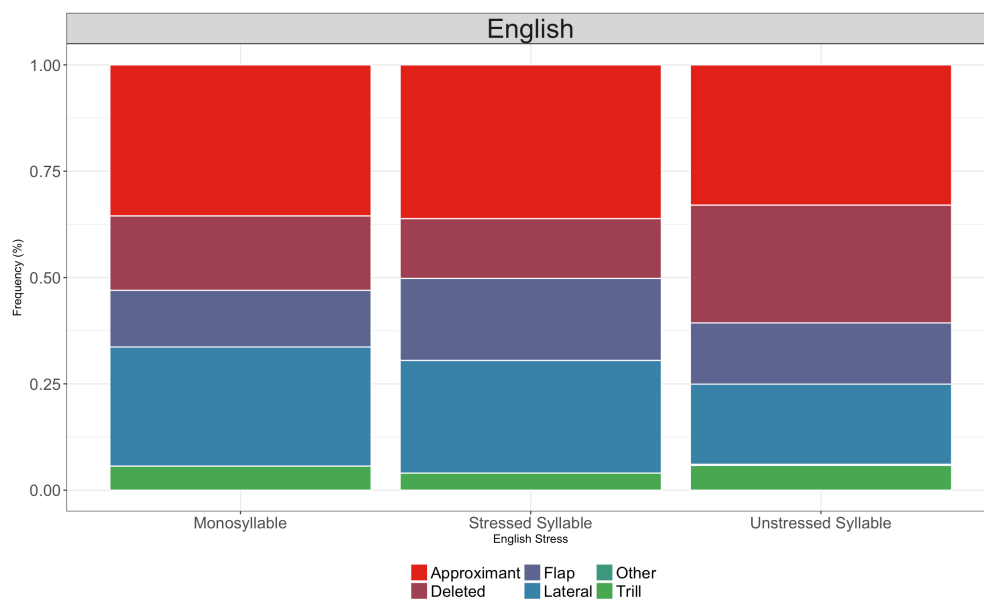


Figure 6.13: Distribution of English prevocalic /r/ variants according to English syllable stress

According to Figure 6.14, stressed and unstressed syllables facilitated the use of the standard approximant [ɹ] at similar rates. Only two variants were employed clearly differently in two syllables, including the standard Thai flap [ɾ] and the lateral [l], with stressed syllables enhancing the lateral [l] but unstressed syllables associating with the flap [ɾ]. With the prestigious standard Thai rhotic, both syllables disfavoured the trill [r] approximately equally. In a general sense, Figure 6.14 suggests that the use of the unmarked [l] was inhibited in L2 English. However, the production of the unmarked [Ø] seems to increase in stressed syllables in L2 English compared to stressed syllables in L1 Thai, and vice versa for unstressed syllables. With regard to the predominant approximant [ɹ] in both positions of syllables, the frequency of approximant [ɹ] use was lower than the overall use of other variants allowed in and transferred from L1 Thai, including the flap [ɾ], trill [r], lateral [l], and deleted [Ø] variants. To put it simply, speech production in the L2 was commonly based on both standard and non-standard Thai rhotics rather than on the sound used in English, which is the approximant [ɹ]. There do not appear to be any target words in the passage in which syllable or phrasal stress occurs. These factors therefore do not seem to influence the pronunciation of these target words.

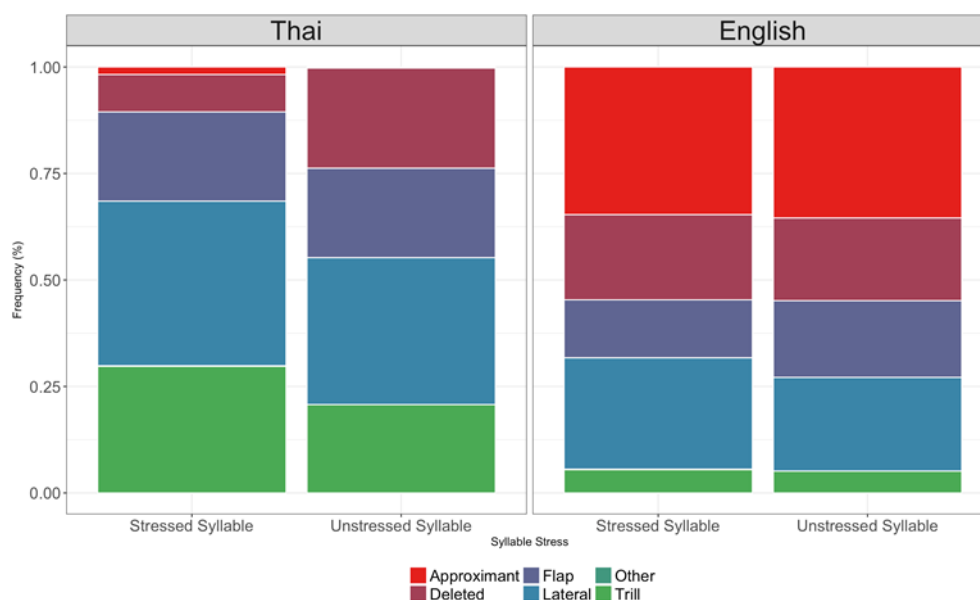


Figure 6.14: Distribution of Thai and English prevocalic /r/ variants according to syllable stress

As shown in Figure 6.15, the pattern of /r/-/l/ merger was approximately similar for both types of syllables. For this reason, the effect of syllable stress was not included in the model of best fit in Table 6.3. As evidenced, the effect of syllable stress did not exert a significant effect on the use of /r/-/l/ distinction or merger in both L1 Thai and L2 English. With regard to the tonal system in Thai, the results found in this section did not correspond to the preservation of lexical tone in stressed syllables in Thai because preservation of the /r/-/l/ distinction, in contrast, was used more often with unstressed than expected stressed syllables. As a result, the speech production of the prevocalic /r/ in L2 English was not governed by the tonal and stressed pattern of Thai. Syllable stress yields the order of the rate of /r/-/l/ merger, from higher to lower rates: stressed > unstressed.

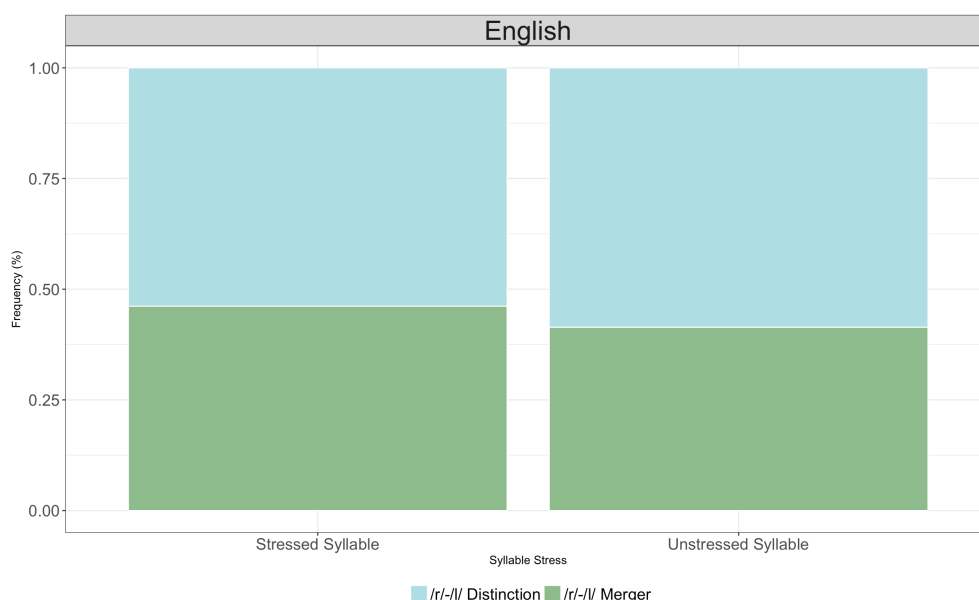


Figure 6.15: English prevocalic /r/: the merger of /r/ and /l/ according to syllable stress

6.9.2 Preceding sound

The phonetic context preceding the segment in question considered in the present study formed three groups: pauses, vowels, and consonants. In light of the initial strengthening effect (Keating *et al.* 2003), it could be the case that a preceding pause becomes more salient than a preceding vowel or consonant due to the initial strengthening effect. It is because the consonant following a pause is the first consonant, and so the speaker has more time to process what is coming next. It was thus expected that the salience of a preceding pause would be more likely to result in the distinction between /r/ and /l/ than a preceding vowel or a preceding consonant. It is worth mentioning that, because the target words in the two tasks of picture naming and minimal pair reading target only monosyllabic words, there is no /r/ in these two tasks following a vowel.

The results shown in Table 6.5 indicate that a preceding pause was most often accompanied by the English approximant [ɹ], 47.17% of the time, followed by a preceding vowel at 39.33%, and a preceding consonant at 24.33%. The /r/ omission [Ø] only occurred following a preceding consonant, and this happened in 40% of cases. A preceding vowel represented the highest percentage of cases of the lateral [l] at 34%, while a preceding consonant occurred with the lateral [l] least often, at 18.5%, and a preceding pause in between at 30.43%. The flap [ɾ] and trill [r] were chosen respectively 16.52% and 5.87% of the time with a preceding pause, 21.33% and 4.67% with a preceding vowel, and 12% and 5.17% with a preceding consonant.

Realisation		Preceding sound		
Variant	Binary variant	Preceding pause (Total 460)	Preceding vowel (Total 150)	Preceding consonant (Total 600)
Approximant [ɹ] (N)	Distinction	47.17% (217)	39.33% (59)	24.33% (146)
Flap [ɾ] (N)		16.52% (76)	21.33% (32)	12% (72)
Trill [r] (N)		5.87% (27)	4.67% (7)	5.17% (31)
Other (N)			0.67% (1)	
Lateral [l] (N)	Merger	30.43% (140)	34% (51)	18.5% (111)
Deleted [Ø] (N)				40% (240)

Table 6.6: Distribution of English prevocalic /r/ variants according to preceding sound

It is shown in Figure 6.16 that, with a preceding consonant, while the use of the lateral [l] declined from L1 Thai to L2 English, the /r/-cluster omission [Ø] increased in the L2. In other words, while a preceding pause or vowel was associated with the use of the standard approximant [ɹ] and minimised L1 retention, a preceding consonant inhibited L2 acquisition development and thus L1 transfer was found at the highest rate. The use of standard Thai flap [ɾ] and trill [r] rhotics obviously decreased when the speakers had acquired L2 English, with the increasing production of the English approximant [ɹ]. As a result, features with a preceding consonant could be most clearly attributed to L1 transfer, especially the unmarked features of the deletion [Ø] followed by the lateral [l]. The findings conflict with those of Chunsuvimol (1993) that cluster deletion [Ø] was adopted more frequently in L1 Thai at 79.6%, while in L2 English speakers were found to more frequently exhibit cluster maintenance at 64.8%.

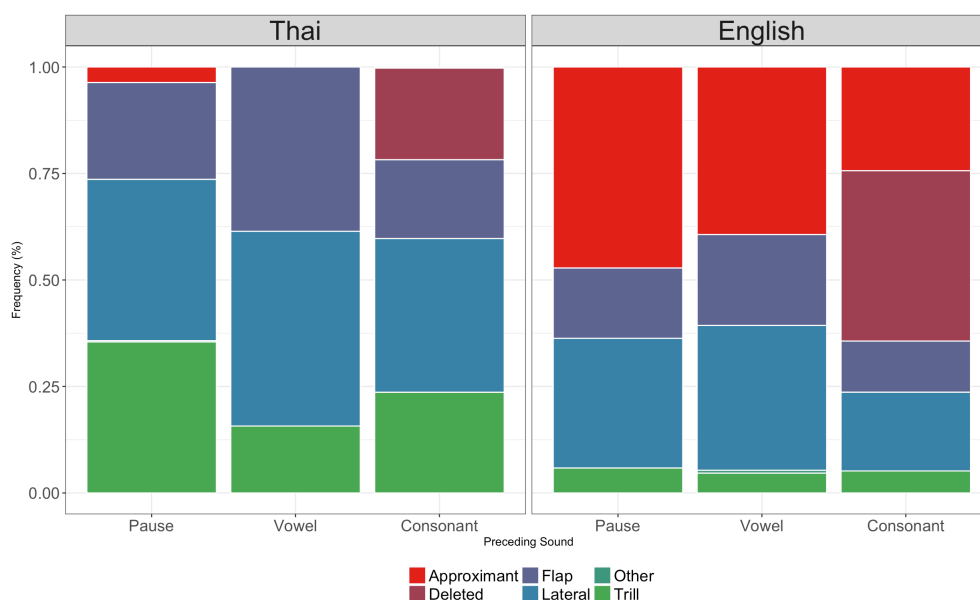


Figure 6.16: Distribution of Thai and English prevocalic /r/ variants according to preceding sound

Figure 6.17 illustrates the role preceding segments played in /r-/l/ distinction and merger. A preceding pause was consistently most resistant to the subsequent application of /r-/l/ merger, followed by a preceding vowel and then a preceding consonant. When /r/ followed a pause, it could be the case that the subjects could separate the prevocalic /r/ from other segments more straightforwardly due to a noticeable break in the connected words, and could thus distinguish between /r/ and /l/ more successfully. Among these preceding segment types, a preceding consonant will have more of a co-articulatory effect on the following sound, and more so for a vowel, so a preceding consonant exhibited the highest percentages of /r-/l/ merger. As evidenced, the findings corresponded to the hypothesis posited above. So, the hierarchy of the occurrence of /r-/l/ merger for preceding sounds from higher to lower rates is: consonant > vowel > pause.

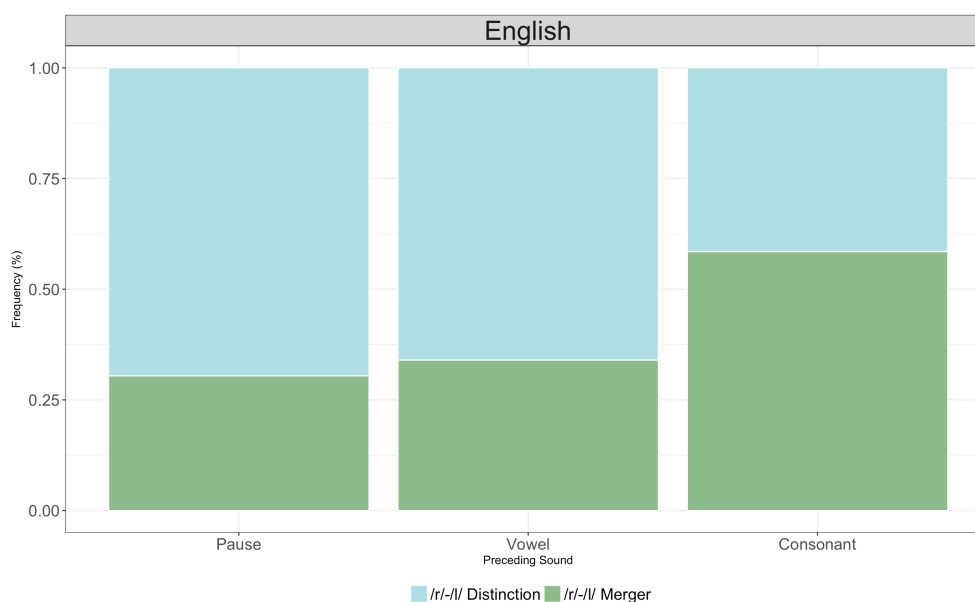


Figure 6.17: English prevocalic /r/: the merger of /r/ and /l/ according to preceding sound

6.9.3 Age

It has been suggested that age influences the choice of sound variants, with standard variants being more likely to be preserved by older speakers (Beebe 1974; Pookkawes 2014). With regard to the transfer effect, this section examines whether or not the social constraint of age which plays role in L1 also affects the choice of variant in L2. Pookkawes studied subjects whose ages ranged far more widely than the subjects of the present study. Nevertheless, it seemed important to investigate whether age, in itself, was a factor in the choice of sound variants. The division of subjects into 20s and 30s+ groups is perhaps somewhat artificial, but it represents an attempt to investigate the influence of age on speech production in the present study. A total of ten speakers in the present study were grouped into two groups aged in their 20s and 30s+, including five speakers in each group. According to Table 6.6, while the 20s showed the highest rate of approximant [ɹ] usage, the 30s+ group selected the lateral [l] more often. That is, those aged in their 20s exhibited the approximant [ɹ] 48.26% of the time, which was considerably more often than the 30s+ at 21.49%. The lateral [l] was chosen by the 30s+ at 34.71%, which was approximately twice the rate for the 20s at 15.21%. As for the standard Thai rhotics, while the flap [ɾ] was employed less often by the 20s group, at 12.4%, than the 30s+ at 17.36%, the prestigious standard trill [r] showed a contrasting pattern, with the 20s being more likely to choose the trill [r] at 6.94%, than the 30s+ at 3.8%. The use of /r/-cluster deletion [Ø] increased from 17.19% among the 20s to 22.48% by the 30s+.

Realisation		Age group	
Variant	Binary variant	20s (Total 605)	30s+ (Total 605)
Approximant [ɹ] (N)	Distinction	48.26% (292)	21.49% (130)
Flap [ɾ] (N)		12.4% (75)	17.36% (105)
Trill [r] (N)		6.94% (42)	3.8% (23)
Other (N)			0.17% (1)
Lateral [l] (N)	Merger	15.21% (92)	34.71% (210)
Deleted [∅] (N)		17.19% (104)	22.48% (136)

Table 6.7: Distribution of English prevocalic /r/ variants according to age group

Figure 6.18 demonstrates the speech production according to individual's age when treated as a continuous variable. The youngest speaker aged 20 showed the most frequent use of the prestigious standard Thai trill [r] along with the standard English approximant [ɹ]. Both the trill [r] and the approximant [ɹ] showed the similar pattern in that these two variants were realised most frequently among the younger speakers and gradually declined in older speakers. On the other hand, the oldest speaker preferred the unmarked variants of lateral [l] and /r/-cluster deletion [∅], with the standard rhotics of L1 Thai and L2 English infrequently being pronounced. For this reason, L2 Thai learners of English showed the contrast pattern in the use of standard and non-standard variants in relation to speakers' age. It showed in the present study that the younger speakers were more likely to use the rhotics resulting in the distinction between /r/ and /l/, whereas the older subjects had the tendency towards the non-standard variants regarded as the merger of /r/ and /l/. Information on the ages of speakers can be found in Table 4.1.

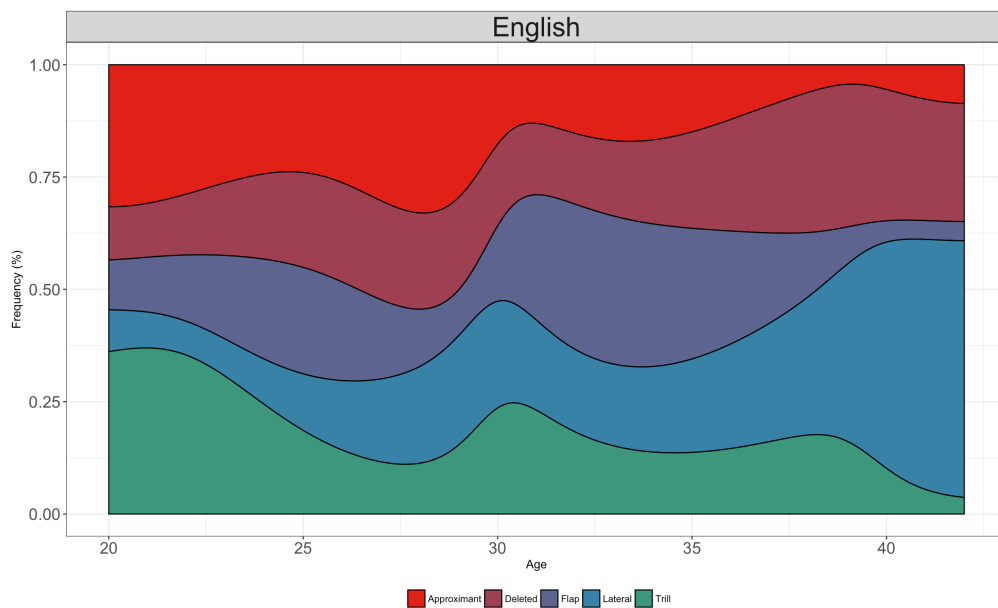


Figure 6.18: Distribution of English prevocalic /r/ variants according to age

The results for the effect of age group in L1 Thai and L2 English are illustrated in Figure 6.19. The unmarked lateral [l] was less often transferred to L2 English due to the less frequent use in both age groups, whereas production of the /r/-cluster deletion [Ø], which is regarded as the most stigmatised in prevocalic /r/ use, increased in both groups of speakers. That is to say, L2 acquisition facilitated the production of the deletion [Ø]. In L2 English, the 30s+, who had been expected to retain the standard variant due to transfer effect, instead showed greater proportions of lateral [l] and deleted [Ø] variants, while the 20s group sharply increased the selection of the standard English approximant [ɹ].

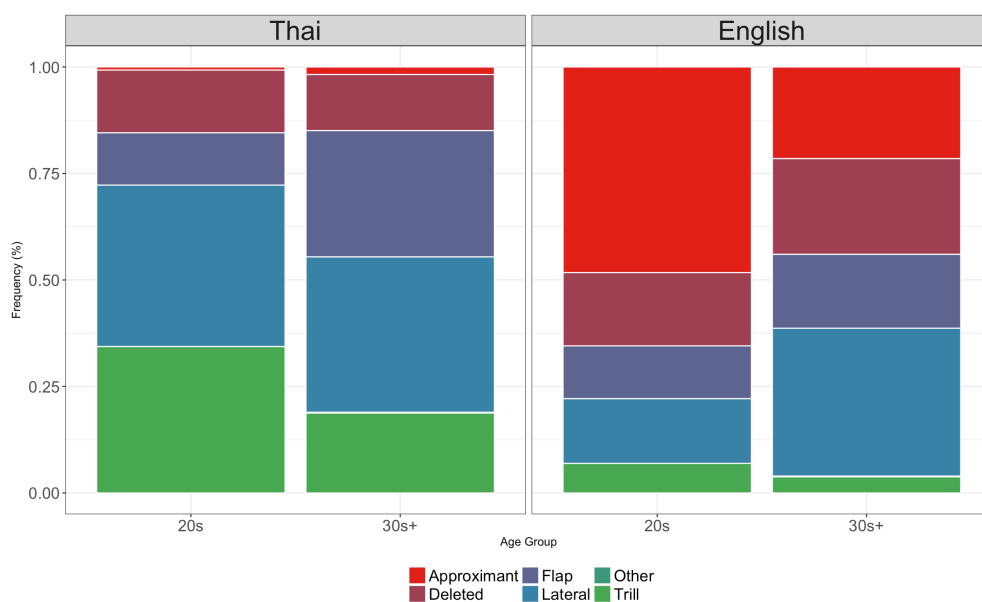


Figure 6.19: Distribution of Thai and English prevocalic /r/ variants according to age group

As discussed in Section 6.7, the effect of age group was not significant and did not exert a significant effect on /r-/l/ distinction or merger on its own, but an interaction of the effect of age group and speech style did generate a stronger effect. As shown in Figure 6.20, an unexpected result of the more frequent /r-/l/ merger by the 30s+ group is demonstrated. The results failed to support the hypothesis because the variant of /r-/l/ distinction was used by the 20s approximately twice as frequently as by the 30s+ who had been predicted to maintain /r-/l/ distinction. For this reason, it must be formally accepted that the findings in L2 English do not correspond to those of previous research (Beebe 1974; Pookkawes 2014) which suggested that, in L1 Thai, older subjects were less likely to replace /r/ with /l/ and delete cluster member than younger speakers. So, the hierarchy of the merger of /r/ and /l/ for age groups from higher to lower rates is: 30s+ > 20s.

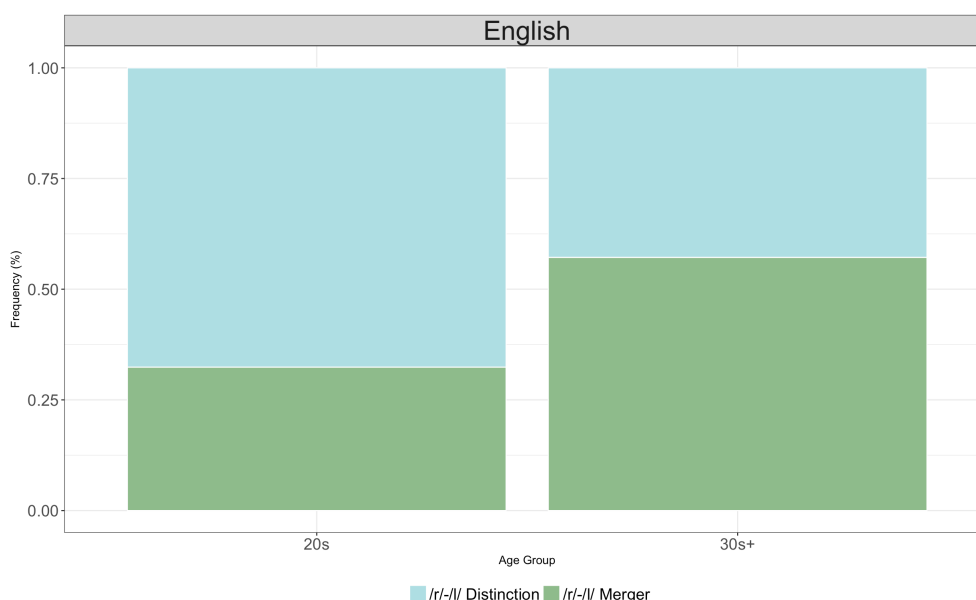


Figure 6.20: English prevocalic /r/: the merger of /r/ and /l/ according to age group

The use of /r/-/l/ distinction, and especially the target-like English approximant [ɹ], by the 20s was possibly due to the fact that bilingual or international programmes in schools or universities in Thailand as well as international schools administrated by native speakers of English have increasingly been offered to the younger speakers in recent decades. In contrast, older learners were less likely to have studied in international schools because, in the past, there were considerably fewer of these schools. The difference in the number of years that the five subjects in each of the two groups had been exposed to English spoken by native speakers could well be a factor in accounting for the absence of the finding of an effect related to age. As seen in Figure 6.21, the length of time, either more than or less than five years, during which the 20s and 30s+ subjects had spent learning English taught by native speakers of English was clearly much greater for the 20s group. For this reason, rather than the effect of age, the effect influencing the choice of variant might be the length of time the learners were exposed to English spoken by a native speaker.

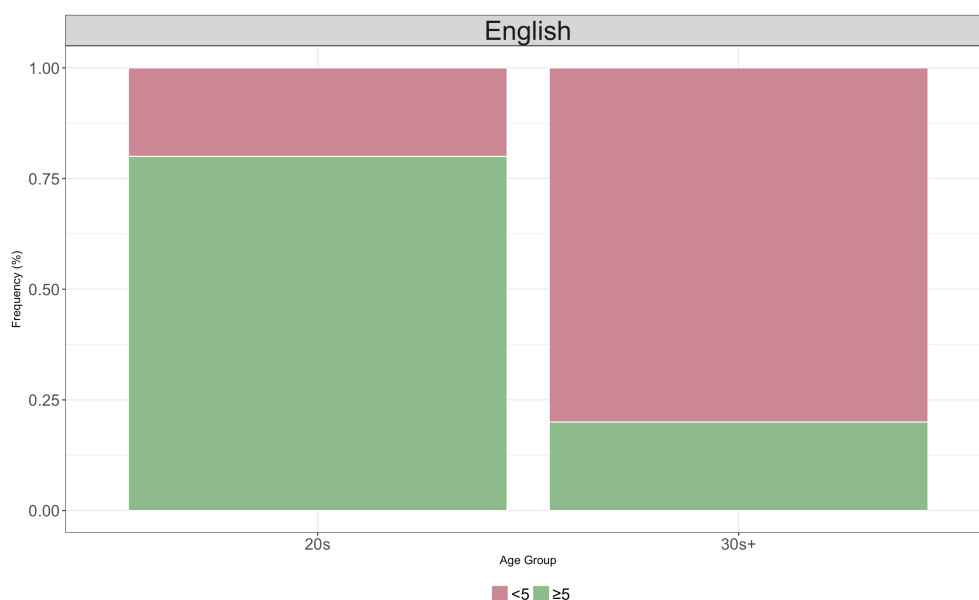


Figure 6.21: Years learning English with native speakers of English according to age group

6.9.4 Gender

It has been suggested by Senawong (1992) and Chunsuvimol (1993) that female speakers prefer the standard and prestigious variants more than male speakers do. As a result, it was predicted that females favour the distinction between /r/ and /l/ more frequently than counterpart males. As summarised in Table 6.7, females and males used each variant in similar proportions. The approximant [ɹ] was the most favoured variant employed by females at 36.53% and at 33.22% by males. The second most preferred variant was the lateral [l], which was adopted by females at 23.47%, slightly less often than by males who produced the lateral [l] 26.45% of the time. The prevocalic /r/ as a cluster member was deleted 17.19% of the time by females and 22.48% of males. Females and males used the flap [ɾ] at very similar rates of 14.55% and 15.21% respectively, whereas the trill [r] was produced by females at 8.26%, which was more often than by males at 2.48%.

Realisation		Gender	
Variant	Binary variant	Female (Total 605)	Male (Total 605)
Approximant [ɹ] (N)	Distinction	36.53% (221)	33.22% (201)
Flap [ɾ] (N)		14.55% (88)	15.21% (92)
Trill [r] (N)		8.26% (50)	2.48% (15)
Other (N)			0.17% (1)
Lateral [l] (N)	Merger	23.47% (142)	26.45% (160)
Deleted [∅] (N)		17.19% (104)	22.48% (136)

Table 6.8: Distribution of English prevocalic /r/ variants according to gender

Figure 6.22 below compares speech production of prevocalic /r/ in L1 Thai and L2 English according to gender. While the unmarked [l] was selected in the L2 less frequently than in L1 Thai, the deletion [∅] was used at a higher rate in English. In general, although females were the predominant users of the lateral [l] in L1 Thai, both the [l] and deleted [∅] variants were more common in males in L2 English. Meanwhile females showed slightly higher production of the English approximant [ɹ], which confirms Chunsuvimol's (1993) findings that the production of prevocalic /r/ in English was conditioned by gender, job, and English exposure. There, the more frequent use of the standard English approximant [ɹ] was found in females, speakers with higher positions at work, and those with longer English exposure.

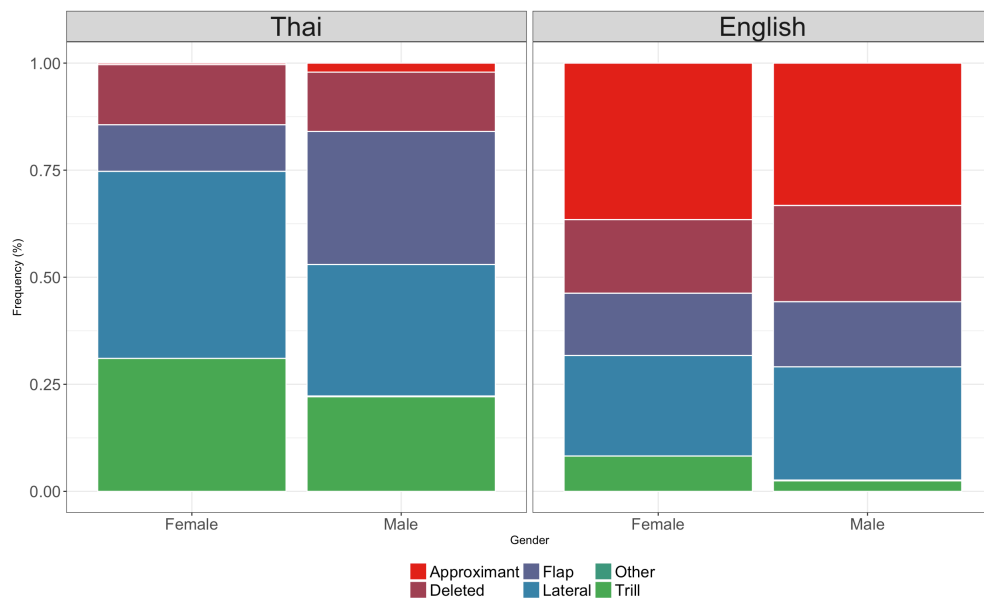


Figure 6.22: Distribution of Thai and English prevocalic /r/ variants according to gender

Figure 6.23 shows that both genders shared quite similar proportions with not a huge margin of difference in the merger of /r/ and /l/. The prediction mentioned above was supported by the preservation of the /r/-/l/ distinction by females, who were expected to maintain the standard features. This suggests that the tendency to maintain the /r/-/l/ distinction in L2 English was stronger among females than in males. In terms of gender, the order of constraints favouring the merger of /r/ and /l/ in L2 English from higher to lower rates is: male > female.

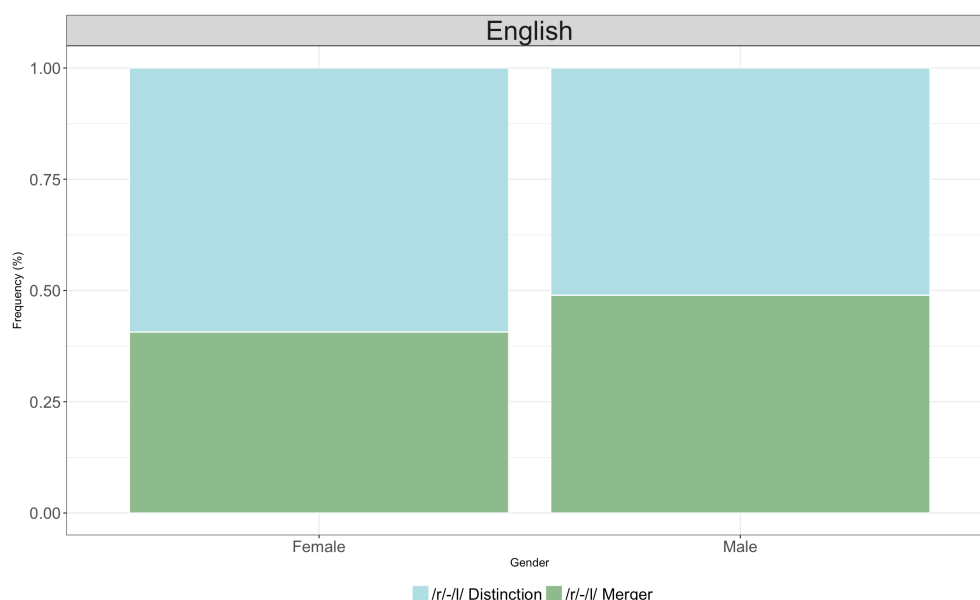


Figure 6.23: English prevocalic /r/: the merger of /r/ and /l/ according to gender

6.9.5 Speech style

As discussed above, /r/-/l/ merger in L1 Thai is a stylistic variation related to the formality of speech. The standard rhotics in Thai were adopted in formal style, whereas /r/-/l/ merger was found to be more frequent in informal speech. As a result, it was predicted that the standard variant was subject to style shifting, with the distinction between /r/ and /l/ being expressed more often in formal rather than in informal situations wherein the process of the modification of /r/-/l/ merger was frequently realised. Data in the present study were observed from four reading styles, representing four different degrees of formality, including naming a picture (NP), reading a passage (RP), reading a word-list (WL), and reading a minimal pair (MP). NP was regarded as the least formal context, followed by RP, WL, and then MP.

According to Table 6.8, the present results indicate that the approximant [ɹ] was the dominant variant in all speech styles except for MP, for which the most favoured realisation was the lateral [l]. In NP, the approximant [ɹ] was exhibited at the highest rate of 45%, followed by RP at 43.43%, MP at 31%, and WL at 29.75%. The speakers increased the use of the lateral [l] from 16.67% in NP to 17.43% in RP, 22.5% in WL, and 35.25% as the most preferred variant in MP. The /r/ omission [Ø] occurred more often in WL at 24% and RP at 23.71%, than in MP at 13.75% and NP at 10%. For NP and RP, the standard Thai flap [ɾ] was chosen at the highest and lowest rates respectively of 21.67% and 12.57%, whereas for WL and MP the rates fell in between, with WL being slightly more likely to adopt the flap [ɾ] at 16.75%, than MP at 14%. The trill [r] was realised most frequently in WL, NP, and MP at

similar rates of 6.75%, 6.67%, and 6% respectively, while RP only minimally selected the trill [r] 2.86% of the time.

Realisation		Speech style			
Variant	Binary variant	Naming picture (Total 60)	Reading passage (Total 350)	Reading word list (Total 400)	Reading minimal pair (Total 400)
Approximant [ɹ] (N)	Distinction	45% (27)	43.43% (152)	29.75% (119)	31% (124)
Flap [r] (N)		21.67% (13)	12.57% (44)	16.75% (67)	14% (56)
Trill [r] (N)		6.67% (4)	2.86% (10)	6.75% (27)	6% (24)
Other (N)				0.25% (1)	
Lateral [l] (N)	Merger	16.67% (10)	17.43% (61)	22.5% (90)	35.25% (141)
Deleted [Ø] (N)		10% (6)	23.71% (83)	24% (96)	13.75% (55)

Table 6.9: Distribution of English prevocalic /r/ variants according to speech style

As Figure 6.24 illustrates, the predominant variant in all speech styles was the approximant [ɹ]. The respondents in the present study are living in the UK and their proficiency as based on IELTS speaking scores range between 5.5-6.5. For this reason, the level of English proficiency of the subjects might contribute to the greater use of the approximant [ɹ] compared to the other variants. The rate of approximant [ɹ] use in L2 English decreased when the level of formality became higher. The result in the present study confirms the findings of Phootirat (2012) and Chunsuvimol (1993) whose informants were students majoring in English and hotel personnel respectively. There, it was found even in the informal context of an interview that the approximant [ɹ] was adopted more often than features transferred from L1 Thai.

The standard Thai flap [r] and trill [r] were less often transferred to L2 English, especially in the connected speech of RP. As for the production of the unmarked sound, the /r/

omission [Ø] occurred less frequently in both the least and most formal contexts of NP and MP. The present study presents unexpected results in that the pronunciation of the lateral [l] occurred most often in the most formal situation of MP rather than in the less formal contexts, with similar rates in both the L1 and L2. In the other three contexts, the speakers preferred not to transfer the unmarked lateral [l] to L2. NP, the least formal task, was the predominant user of the standard variants in both languages; that is, the flap [ɾ] and trill [r] in L1 Thai and the approximant [ɹ] in L2 English. In contrast, both standard Thai rhotics were employed at lower rates in the most formal situation of MP in L2 English.

For this reason, the results of the present study did not corroborate the findings in earlier research by Beebe (1980), who found that the speech production of /r/ in L2 English by native speakers of Thai was influenced by L1 transfer effects, particularly in formal styles. There, the prestigious standard Thai trill [r] was transferred and adopted more frequently in a formal context of word-list reading rather than in the informal setting of the interview wherein negative transfer from L1 Thai was impeded. Then Beebe draws the conclusion concerning this unexpected finding that the speakers acknowledged that the prestigious standard [r] was generally adopted in the formal context in L1 Thai and was thus used in the formal situation in interlanguage phonology. In this sense, the speakers transferred both variants and stylistic parameters from L1 Thai to L2 English. For this reason, the distribution shown in Figure 6.24 did not confirm Beebe's and Tarone's findings due to the largest proportion of the lateral [l], in MP, instead of the flap [ɾ] and trill [r] transferred from L1 Thai.

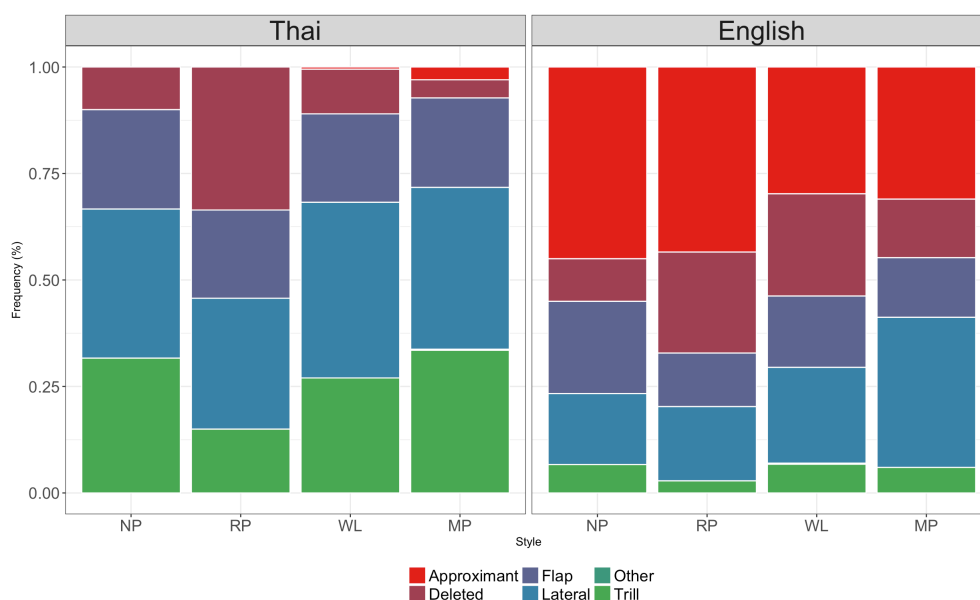


Figure 6.24: Distribution of Thai and English prevocalic /r/ variants according to speech style

The effect of speech style on /r/-/l/ merger in L2 English can be seen in Figure 6.25. It is apparent that the interlanguage features are attributed to the distinction between /r/ and /l/, which was pronounced at rates of more than 50% in all speech styles. Surprisingly, the speakers merged /r/ and /l/ at a higher rate in formal speech of WL and MP, with the preservation of /r/-/l/ distinction occurring in the less formal styles of NP and RP. For this reason, the present results did not support the hypothesis which predicted that /r/-/l/ distinction was likely to be maintained in formal rather than in informal contexts. In fact, the results in the present study showed a contrasting pattern, where the informal NP and RP styles were rather resistant to the merger of /r/ and /l/. The L2 learners had a tendency towards merger as the styles became more formal. It should be noted again that the effect of speech style failed to reach statistical significance because it did not exert a significant effect on the merger of /r/ and /l/ on its own. It seems like the merger of /r/ and /l/ in L2 English was not really conditioned by speech style. In terms of the levels of formality of speech style, the hierarchy of the merger of /r/ and /l/ from higher to lower rates is: MP > WL > RP > NP.

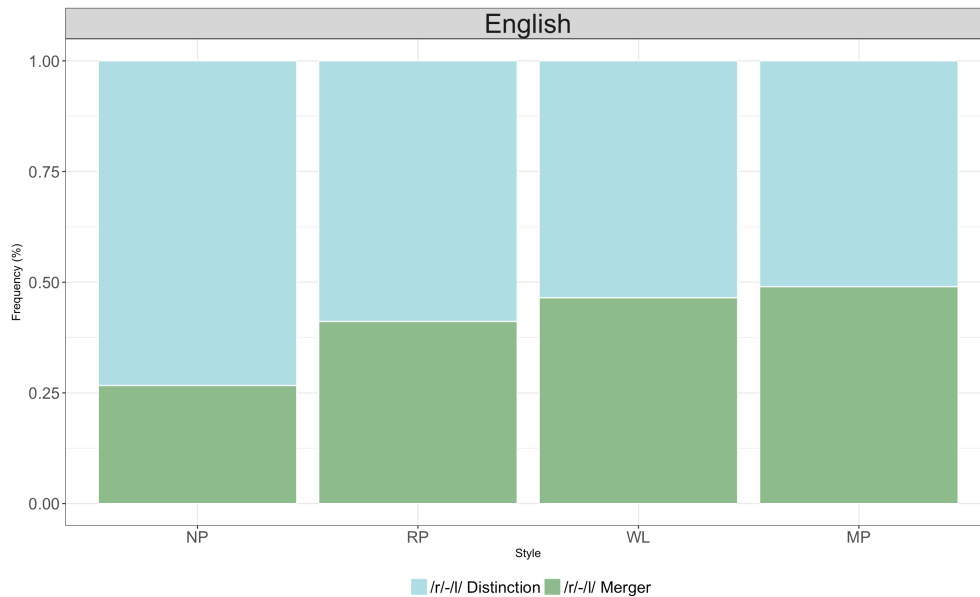


Figure 6.25: English prevocalic /r/: the merger of /r/ and /l/ according to speech style

Figure 6.26 demonstrates how native speakers of Thai produced the onset /r/ in the task of minimal pair reading and the preservation of the /r/-/l/ distinction was found to be more frequent in an /r/-/l/ environment. That is, when the speakers read the contrastive pair of /r/ and /l/, they might become more aware of their oral production, resulting in the higher use of the /r/-/l/ distinction, especially in English. In this way, with regard to pairs of /r/ and /l/, the speakers were more careful in pronouncing /r/ in L2 English than in L1 Thai.

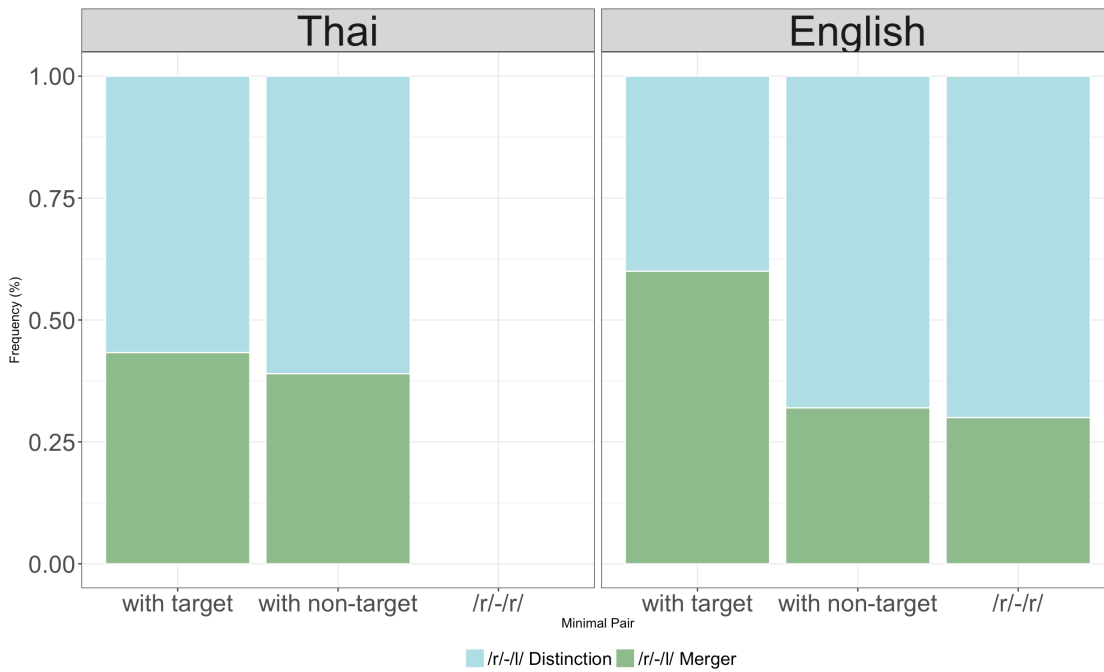


Figure 6.26: English prevocalic /r/: the merger of /r/ and /l/ according to speech style

An increasing use of the /r/-/l/ merger in formal contexts is possibly due to the order of the tasks completed during the recording session, as shown in Figure 6.27, which began with NP (first), followed by RP (second), WL (third), and then MP (fourth). While the first task involved the self-conscious use of /r/-/l/ distinction, the speakers might then become less deliberative or more relaxed in the latter tasks of RP, WL, and MP, notwithstanding their higher degrees of formality.

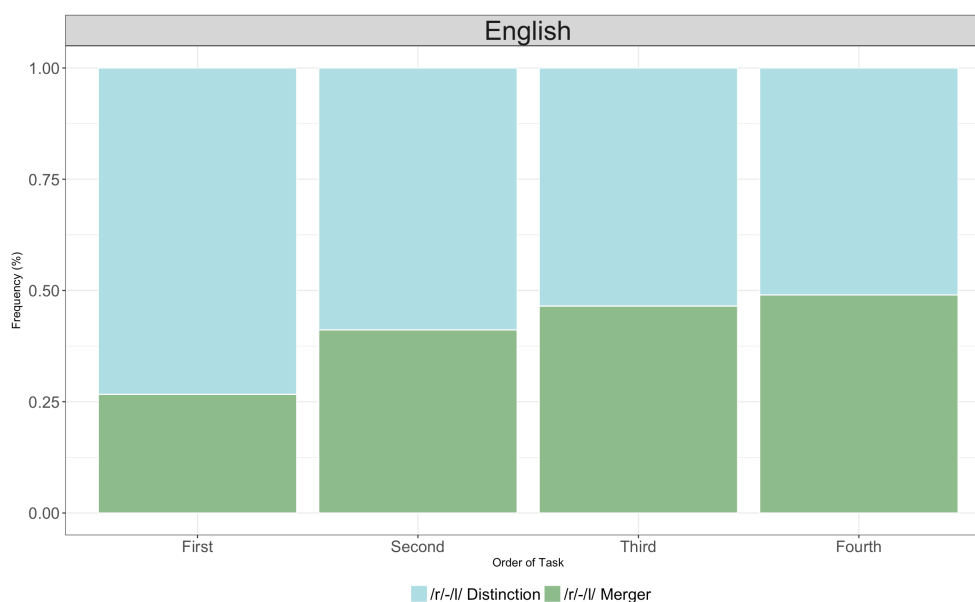


Figure 6.27: English prevocalic /r/: the merger of /r/ and /l/ according to order of tasks

6.9.6 IELTS speaking score

IELTS speaking score is used as an indicator of speakers' proficiency levels in the present study. The speakers were grouped into two groups of the 5s and 6s groups based on their IELTS speaking score. It was expected in the present study that speakers with higher scores paid closer attention to their speech production and thus aimed for use of standard features. Moreover, the use of an approximant [ɹ] in in prevocalic position was heard in native speakers of Thai who had studied in international schools or were fluent in English (Beebe 1974; Chunsuvimol 1993; Phootirat 2012). As a result, the preservation of /r/-/l/ distinction was expected to be found in subjects with higher IELTS speaking scores due to their better awareness and attention paid to their speech.

As illustrated in Table 6.9, the approximant [ɹ] was predominant variant selected at exactly identical percentages by the 5s and 6s groups at 34.9% each. These results fail to support Beebe (1974: 119), Chunsuvimol (1993), and Phootirat (2012) who suggested that the approximant [ɹ] was adopted by the speakers who were more fluent in English. Turning to unmarked features, the 6s deleted /r/, at 20.5%, slightly more frequently than the 5s at 19.2%, while the 5s replaced /r/ with the lateral [l] at 32.9%, approximately twice as often as the 6s at 17%. With standard Thai rhotics, the 6s exhibited the flap [ɾ] at 18% and trill [ʀ] at 9.4%, at higher rates than their 5s counterparts who chose the flap [ɾ] and the trill [ʀ] at 11.7% and 1.3% respectively.

Realisation		IELTS speaking score	
Variant	Binary Variant	5s (Total 605)	6s (Total 605)
Approximant [ɹ] (N)	Distinction	34.9% (211)	34.9% (211)
Flap [ɾ] (N)		11.7% (71)	18% (109)
Trill [r] (N)		1.3% (8)	9.4% (57)
Other (N)			0.2% (1)
Lateral [l] (N)	Merger	32.9% (199)	17% (103)
Deleted [∅] (N)		19.2% (116)	20.5% (124)

Table 6.10: Distribution of English prevocalic /r/ variants according to IELTS speaking score

As seen in Figure 6.28, it is obvious that the approximant [ɹ] was clearly used much more often in L2 English than in L1 Thai. As to the production of the unmarked variants, the quantitative analysis showed that the lateral [l] was transferred to and used in the L2 as the second most preferred variant by the 5s, whereas deletion [∅] was chosen at similar rates by both groups. The cluster deletion [∅] produced by the speakers in two groups contradicted the findings of Seubsunk (1999) and Phootirat (2012) who suggested that the cluster member retention was more likely to be found in the subjects with advanced English proficiency. With regard to the 6s, who were found to express the trill [r] at a much greater frequency in L1 Thai and continued using the flap [ɾ] in the L2 at a broadly similar rate as in L1, the prestigious Thai trill [r] was transferred to the L2 at considerably very low rates. Interestingly, although both groups similarly preserve the standard English approximant [ɹ], the 6s group was more careful in speech production in both L1 Thai and L2 English, showing lower rates of the lateral [l] production in both languages.

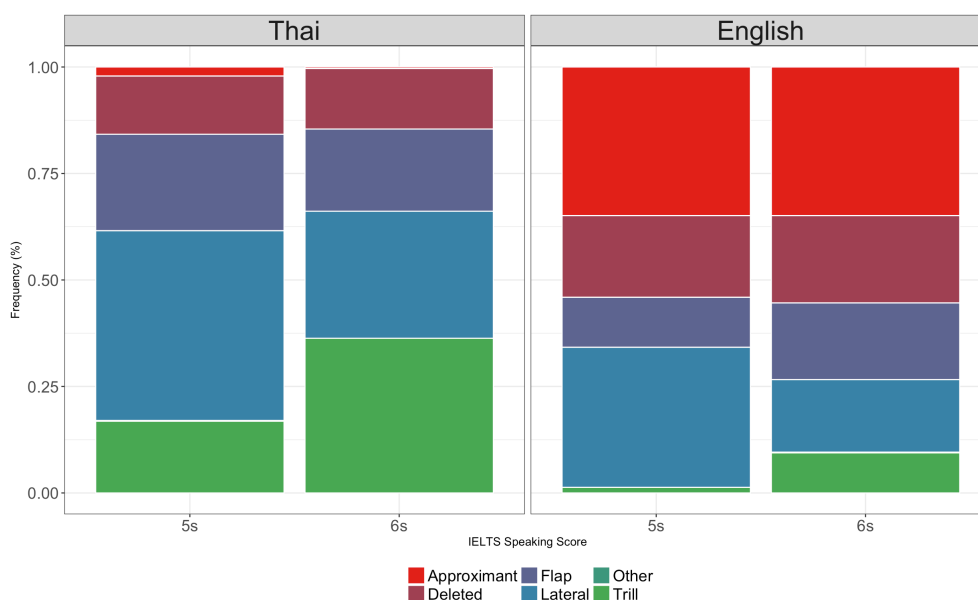


Figure 6.28: Distribution of Thai and English prevocalic /r/ variants according to IELTS speaking score

Figure 6.29 demonstrates how English proficiency levels as based on the IELTS speaking score comes into play in the /r-/l/ merger. It should be noted that the effect of IELTS speaking score does not contribute significantly to variations in /r-/l/ merger. It was found that the preservation of /r-/l/ distinction was stronger in the 6s, with the 5s being found to merge /r/ and /l/. This might be because the 6s were paying more attention to their speech production and thus avoided using the non-standard features. For this reason, the hypothesis holds true, since the 6s are the more frequent users of /r-/l/ distinction. The order of constraints favouring the merger of /r/ and /l/ according to IELTS speaking score, from higher to lower rates, is: 5s > 6s.

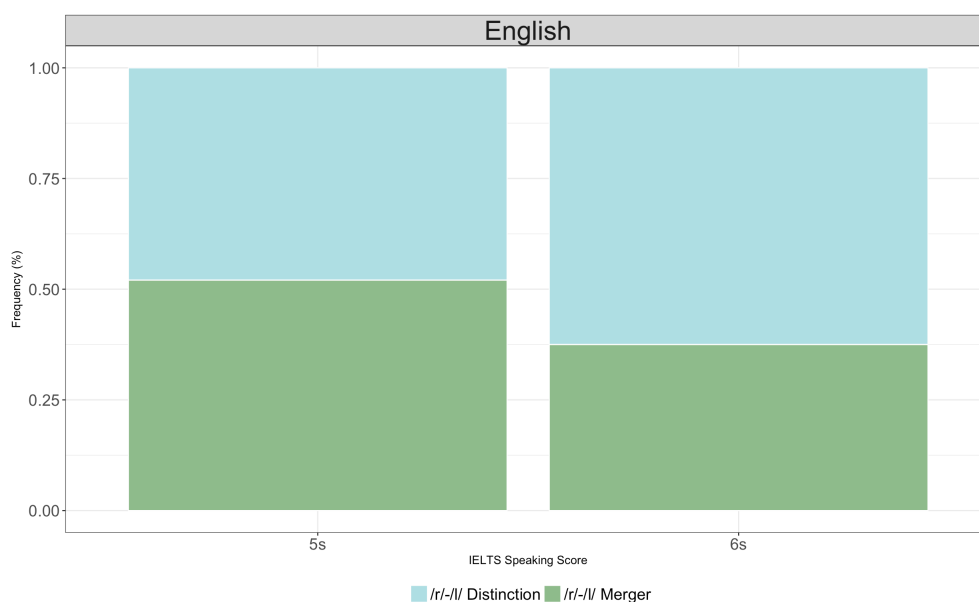


Figure 6.29: English prevocalic /r/: the merger of /r/ and /l/ according to IELTS speaking score

6.10 Summary

This chapter has answered four research questions by examining the validity of the MDH, the degree of difficulties and degree of markedness, the interaction of markedness and transfer, and how linguistic and extralinguistic factors played roles in the merger of /r/ and /l/ in L2 English. In general, the findings show that the common prevocalic /r/ variants used in L1 Thai and L2 English are different. While the lateral [l] is realised predominantly in L1 Thai, the speakers increasingly use the standard English approximant [ɹ] when acquiring L2. With regard to the research question 1) of whether or not the MDH is able to explain the errors subjects make in learning L2 English, overall speech production in L2 English supports the MDH. The research question 1.1) explores if the patterns of acquisition and the difficulties associated with certain forms correspond to the markedness relations between L1 and L2. It reveals that the results contradict the prediction of the MDH because the most marked approximant [ɹ] is produced at the highest rate. With regard to the research question 1.2), the results confirm that the unmarked lateral [l] and /r/-cluster deletion [Ø] are selected more frequently than the more marked variants of the standard Thai flap [ɾ] and trill [r] when native speakers of Thai acquiring the prevocalic /r/ in L2 English. As evidenced, the markedness effect outweighs the transfer when learning L2. The results found in relation to the research questions 1) and 1.2) thus support the MDH because the L2 Thai learners of English have difficulty in acquiring the marked approximant [ɹ]. In this respect, the unmarked features used in Thai are transferred and acquired before the marked features when learning an L2. On the other hand, the relative degree of difficulties does not correspond to the relative degree of

markedness, so the results related to research question 1.1) are against the prediction of the MDH. In light of the research question 2), the model of best fit, as determined by the generalised mixed effects logistic regression, illustrates that the linguistic factor of preceding sound and interacting extralinguistic factors of age group and speech style significantly affect the merger of /r/ and /l/ when acquiring L2 English. The predictor of gender which significantly influences /r-/l/ merger in L1 Thai is not transferred to make up the significant predictor in L2 English. The merger of /r/ and /l/ in L2 English are more frequent to be found within stressed syllables, after a preceding consonant, in speakers aged in their 30s+, in male speakers, in formal context of minimal pair reading, and by L2 learners with IELTS speaking score of 5s. The next chapter presents the discussion and conclusion of the present study.

Chapter 7. Discussion and Conclusion

7.1 Introduction

This chapter is divided into three main sections including a discussion of the findings and the implications for /r/-/l/ merger in Thai, the conclusions of the study, and the limitations of the research and suggestions for future research.

7.2 Discussion

The present study examines the relationship between theoretical phonology and L2 acquisition which is supplemented by a variationist analysis. The primary aim is to highlight the validity of the Eckman's (1977) Markedness Differential Hypothesis (MDH) with regard to the acquisition of the prevocalic /r/ by L2 Thai learners of English. It also aims to investigate the linguistic and social constraints of the /r/-/l/ merger in Thai and English. It addresses four major issues: the difficulties in L2 acquisition on the basis of the MDH, the relative degree of difficulty and the relative degree of markedness, the interaction of markedness and transfer, and the effect of linguistic and extralinguistic factors on the choice of speech production. The present study thus explores how L2 Thai learners of English produce liquids in both L1 Thai and L2 English. These four areas are explained in the following sections.

7.2.1 Overall distribution of prevocalic /r/ in L1 and L2

Prevocalic /r/ contributes to the distributional pattern of five major variants, including the approximant [ɹ], deletion [Ø], flap [ɾ], lateral [l], and trill [r], with L1 and L2 exhibiting differences in the commonly selected variants. While the predominant variant of prevocalic /r/ in L1 Thai is the lateral [l], the speakers most frequently use the approximant [ɹ] in L2 English. It should be noted again that the flap [ɾ] and trill [r] are standard Thai rhotics, while the lateral [l] and deleted [Ø] variants are considered the non-standard features. In L2 English, the approximant [ɹ] is regarded as the standard rhotic. In L2 acquisition, the frequency of use of standard Thai flap [ɾ] and trill [r] as well as lateral [l] decreases, while the deletion [Ø] is found to increase.

In response to the research question 1), the present study aims to demonstrate the validity of the MDH. According to the MDH, if the features in L2 are different from and relatively more marked than those used in L1, these more marked features will be problematic for L2 learners. Because the approximant [ɹ] in L2 English is more marked than the flap [ɾ]

and the trill [r] permitted in L1 Thai, native speakers of Thai acquiring L2 English are predicted to have difficulties in acquiring the L2 rhotic. With reference to the findings given in Section 6.4 of Chapter 6, L2 Thai learners of English have difficulties in acquiring the prevocalic /r/ in English. It is found that the variants transferred from L1 Thai are produced approximately two-third of the time from the overall production. That is to say, prevocalic /r/ in L2 which is more marked is typically modified in favour of the relatively less marked variants used in L1. With overall production, the lower rate of standard English approximant [ɹ] usage, compared with the overall production of other four variants transferred from the L1, is indicative of difficulties the speakers still have in acquiring the prevocalic /r/ in L2 English. As a result, the findings support the prediction of the MDH, which is that more marked features in L2 will lead to learning difficulties.

The research question 1.1) investigates the relative degree of difficulty in the light of the relative degree of markedness. According to the MDH, the degrees of difficulties are based on the relative degrees of markedness. Unmarked features or structures will be less difficult and thus acquired earlier, while relatively more marked features or structures will be more difficult and acquired later. If the features in L2 are comparatively more marked than those in L1, L1 transfer is more likely to occur. With regard to the liquids, it is thus predicted that the L2 Thai learners of English would produce the lateral [l] at a higher rate, followed by the trill [r], the flap [ɾ], and the approximant [ɹ], which is most marked according to the cross-linguistic typology suggested by Maddieson (1984). The results, however, show that Thai learners of English turn out to select the approximant [ɹ] as the predominant variant, accompanied by the lateral [l], flap [ɾ], and trill [r]. This unexpected hierarchy of difficulties suggests that the relative degree of difficulty does not correspond to the relative degree of markedness. This is because the most marked feature, which is predicted to be most difficult and produced least often, is in fact used more frequently than other four variants. The emerging L2 phonological repertoire of the approximant [ɹ] as the predominant variant shows that native speakers of Thai are moving towards L2 acquisition development. For this reason, the results, in terms of the relationship between the degree of difficulty and degree of markedness, do not support the MDH.

7.2.2 Interaction of markedness and transfer

This section focuses attention on the research question 1.2), investigating which features - marked or unmarked - are more likely to be transferred to L2 English. The hypothesis in terms of the interaction of markedness and transfer, on the basis the MDH, has been

demonstrated by an analysis of sound production in L2 English. According to the MDH, markedness can predict the L1 transfer in the sense that if L1 features are less marked than those in the L2, transfer will occur. Moreover, the unmarked features will be acquired before the relatively more marked features. It is worth noting that the manner of articulation found in the present study varied for rhotics from the trill [r] to flap [ɾ], approximant [ɹ], lateral [l], and /r/-cluster deletion [Ø] across speakers. While the rhotics are marked, the lateral [l] and /r/-cluster deletion [Ø] are considered unmarked and non-standard. With the rhotics, the flap [ɾ] and trill [r] are standard variants in Thai, but the approximant [ɹ] is associated with non-standard, despite its standard status in L2 English. Of the three non-standard variants of the prevocalic /r/ in Thai, including the approximant [ɹ], lateral [l], and deletion [Ø], the status of the lateral [l] and deleted [Ø] variants is lower than that of the approximant [ɹ], and cluster omission [Ø] is associated with the lowest status (Beebe 1974). To answer the research question 1.2), these five major variants are then categorised into three main groups depending, from the point of view of markedness, on being marked or unmarked and having standard status in each language, including the unmarked lateral [l] and deletion [Ø], marked flap [ɾ] and trill [r], and marked approximant [ɹ]. For this reason, in L2 acquisition, L1 transfer is predicted to occur, with the speakers being expected to produce the unmarked features - lateral [l] and deletion [Ø] - more frequently than the more marked features - the flap [ɾ] and trill [r].

As discussed in Section 6.5 of Chapter 6, the continuum of frequency of selected variants in L1 Thai, from higher to lower rates, is:

unmarked lateral [l] and deletion [Ø] > marked flap [ɾ] and trill [r] > marked approximant [ɹ]

The hierarchy in L2 English is:

unmarked lateral [l] and deletion [Ø] > marked approximant [ɹ] > marked flap [ɾ] and trill [r]

As can be seen from above hierarchy, prevocalic /r/ is typically modified in favour of unmarked realisation in both L1 Thai and L2 English according to the frequency-based typology Maddieson (1984). As a result, it seems that the preference for the unmarked overrides the L1 transfer of standard Thai rhotics when the speakers acquire the prevocalic /r/ in the L2 due to the transfer of the unmarked lateral [l] and deleted [Ø] variants over the more marked flap [ɾ] and trill [r] from L1 Thai to L2 English. It is found that, although the subjects begin to acquire the prevocalic /r/ in L2 English accurately, success is not attained due to the larger proportions of the unmarked [l] and deleted [Ø] variants transferred from L1 Thai. For

this reason, the most frequent use of the unmarked [ɪ] and [Ø] can thus be explained based on the hypothesis of the MDH.

According to abovementioned research questions 1), 1.1), and 1.2), the results show that the MDH is valid in being able to predict difficulties in L2 acquisition and predict which features are more likely to be transferred to L2 English. In terms of the first research question, although there exist two types of speakers, including those who predominantly produce the English approximant [ɪ] and those who transfer features from L1 Thai, the general findings, as illustrated in Figure 6.9, are found to support the MDH due to the substitution of the unmarked variants for the English approximant [ɪ]. The results in terms of the relationship between the degrees of difficulty and degrees of markedness do not support the MDH because the degrees of difficulty found do not correspond to the degrees of markedness. That is, the actual and expected hierarchies of difficulties based on the relative degree of markedness are not parallel. The predictions based on the MDH and the actual results found in the present study are summarised in Table 7.1.

Markedness relations	Predictions of the MDH	Actual results	Support for the MDH
<p>Research Question 1:</p> <p>The English approximant [ɹ] is more marked than the features used in L1 Thai.</p>	<p>The English approximant [ɹ] should be acquired after the features used in L1 Thai, on the basis of overall production.</p>	<p>The English approximant [ɹ] is acquired after the features used in L1 Thai, on the basis of overall production.</p>	Yes
<p>Research Question 2:</p> <p>The markedness hierarchy in relation to the liquids is expressed on the following scale, where the most marked is at the left-hand edge.</p> <p>approximant [ɹ] > flap [ɾ] > trill [r] > lateral [l]</p>	<p>The hierarchy of difficulties should be, where the most difficult feature is at the left-hand edge:</p> <p>approximant [ɹ] > flap [ɾ] > trill [r] > lateral [l]</p>	<p>The hierarchy of difficulties is, where the most difficult feature is at the left-hand edge:</p> <p>trill [r] > flap [ɾ] > lateral [l] > approximant [ɹ]</p>	No
<p>Research Question 3:</p> <p>The lateral [l] and deleted [Ø] variants are less marked than the flap [ɾ] and trill [r].</p>	<p>The lateral [l] and deleted [Ø] variants should be acquired before the flap [ɾ] and trill [r].</p>	<p>The lateral [l] and deleted [Ø] variants are acquired before the flap [ɾ] and trill [r].</p>	Yes

Table 7.1: Summary of results according to the prediction of the Markedness Differential Hypothesis (MDH)

7.2.3 Linguistic and extralinguistic factors as sources of variation

Although the present study does not contain enough subjects to draw any sociolinguistic conclusions, a variationist approach is used to identify trends of the merger of /r/ and /l/ among ten Thai speakers. Due to the small dataset, it is worth noting here that number of participants or tokens per cell for each factor is very small, and so it might not be possible to completely generalise the findings. In relation to the major five realisations produced by native speakers of Thai in the L1 and L2 acquisition, these five variants are further grouped into two binary variants of /r/-/l/ distinction and merger for the purposes of statistical analysis. While the production of the approximant [ɹ], flap [ɾ], and trill [r] is referred to as the distinction between /r/ and /l/, the replacement of /r/ with [l] and /r/-cluster deletion [Ø] are attributed to /r/-/l/ merger. The reason why deletion [Ø] is also associated with merger is due

to the fact that, in Thai, either /r/ or /l/ as a cluster member can be omitted. For instance, the word ‘pray’ and ‘play’ in English might be uttered as ‘pay’ by native speakers of Thai learning English.

It is found in the present study that variations in either /r/-/l/ distinction or merger are conditioned by more than one factor. The model of best fit, discussed in Section 5.3 of Chapter 5 for L1 Thai and Section 6.7 of Chapter 6 for L2 English, illustrates that choices of /r/-/l/ merger in L1 Thai and L2 English are subject to both linguistic and extralinguistic factors. As reported in the findings, the effects of the preceding sound, age group, and speech style significantly affect the /r/-/l/ merger in both L1 and L2 in the statistics. In L1 Thai, the model of best fit demonstrates that the linguistic factor of preceding sound and the interaction of the three extralinguistic predictors of age group, gender, and speech style account for the observed variation. As indicated by the p-values, the effect of a preceding pause and vowel are significantly different from that of a preceding consonant. The effects of a preceding pause and vowel show a tendency towards the distinction between /r/ and /l/. The interaction of three variable predictors of age group, gender, and speech style demonstrates that females aged in their 20s are more likely to merge /r/ and /l/ across all speech styles, while male counterparts reading a minimal pair and a word list express considerable rates of /r/-/l/ distinction. Those aged in their 30s+, both females and males, pattern similarly in the production of merger and distinction.

As with random effects in L1 Thai, speakers F and M respectively showed sharp contrast between /r/-/l/ merger and distinction production. That is, while speaker F used the merger most frequently, speaker M was more likely to preserve /r/-/l/ distinction and did not style-shift. The /r/ in the word /k^hâw.rû:am/ ‘to participate’ is most likely to be distinguished and /prà.p^hē:.nī:/ ‘tradition’ to be merged. According to the markedness perspective, /r/ as the cluster member in the latter word is more likely to be merged suggesting that the speakers have more difficulties in pronouncing clusters of length N than of length N-1. Moreover, the /r/ in first word /k^hâw.rû:am/ ‘to participate’ is in a stressed syllable and in an unstressed syllable in the latter /prà.p^hē:.nī:/ ‘tradition’. In the light of tonal and stress pattern in Thai, an underlying tone is preserved only in a stressed syllable. The preservation of /r/-/l/ distinction in a stressed syllable may follow the tonal system in Thai.

In L2 English, while the effects of preceding segment, age group, and speech style are still significant, the predictor of gender is no longer included in the model of best fit because the effect of gender does not reach statistical significance. The p-values of less than 0.05

indicate that the effect of a preceding pause and a preceding vowel are significantly different from that of a preceding consonant in the baseline. The best-fit model reveals that the effects of a preceding pause and a preceding vowel are likely to lead to the distinction between /r/ and /l/. With regard to an interaction of age group and speech style, both age groups illustrate similar pattern in the production of /r/-/l/ merger. In this respect, merger is more frequently found in the formal contexts of reading a minimal pair and a word list. In informal contexts of naming a picture and reading a passage, the distinction between /r/ and /l/ is more often preserved. A possible explanation offered relates to the effect of task sequence, which might represent a limitation of the present study.

In relation to random effect of speaker, speakers PJ and M showed a tendency towards /r/-/l/ merger and distinction respectively. Interestingly, speaker M was found to most frequently retain the /r/-/l/ distinction in both L1 and L2. With the word as a random effect, the cluster /r/ in ‘playground’ is most likely to be merged, whereas ‘train’ is associated with the highest rate of /r/-/l/ distinction. The possible reason why /r/ in the latter word is more likely to show distinction is due to a salience of a monosyllabic word. The speakers might pay greater attention when reading the monosyllabic word. Moreover, the word ‘train’ is a loanword in Thai meaning ‘to practice’, so native speakers of Thai might be familiar with this word and preserve the cluster /r/ with less difficulty. This is somewhat similar to the argument of Phootirat (2012: 121) in that /r/ in common English words used in Thai, including ‘true’ and ‘prince’, maintain the pronunciation with the flap [r].

The findings show that the linguistic factor of syllable stress demonstrates a converse pattern of /r/-/l/ merger in L1 and L2. Syllable stress yields a hierarchy of the merger of /r/ and /l/ from higher to lower rates in L1 Thai: unstressed > stressed syllables. In L2 English, the order is: stressed > unstressed syllables. As can be seen, unstressed syllables are more likely to be merged in L1 Thai, with stressed syllables in L2 English demonstrating the greater tendency towards merger. As Thai is a tonal language whose underlying tone will be maintained only in the stressed syllables of monosyllabic words and the final syllables of polysyllabic words, the preservation of the /r/-/l/ distinction in stressed syllables in L1 Thai is found to follow this tonal pattern. When L2 learners produce the prevocalic /r/ in L2 English, the tonal system does not come into play, however. With regard to the generalised mixed effects logistic regression, in both languages, syllable stress does not account for the variation and is thus excluded from the model of best fit. For this reason, it seems like the /r/-/l/ merger is not conditioned by syllable stress.

A preceding consonant is found to lead to the adoption of the merger, while the salience of a preceding pause is likely to promote distinction. The identical hierarchy of rates of /r/-/l/ merger according to the preceding sound in the two languages is: preceding consonant > vowel > pause. This possibly suggests that merger starts affecting a preceding consonant and advances to a preceding vowel and then a preceding pause. The effect of initial strengthening according to Keating *et al.* (2003) can explain why a preceding consonant is more likely to lead to merger, followed by the likelihood with a preceding vowel and then a preceding pause. As determined by the generalised mixed effects logistic regression, the factor of the preceding sound exerts a significant predictor on the likelihood of the /r/-/l/ distinction and merger of the prevocalic /r/ in both languages. The linguistic environmental factor of phonetic context preceding the segment in question thus consistently influences the choice of merger in both L1 Thai and L2 English.

In relation to age, where subjects in the present study are grouped into the 20s and 30s+, it is predicted that the older the speaker is, the more likely are the standard features to be used. The effect of age group on the merger in the L1 and L2 is contradictory. The age groups are arranged hierarchically with the frequency of /r/-/l/ merger: 20s > 30s+ in L1 Thai and: 30s+ > 20s in L2 English. The subjects aged in their 20s in L1 Thai are more likely to adopt /r/-/l/ merger, which is more frequently found in the older generation of the 30s+ in L2 English. The unexpected finding in the L2 is resulting from an increasing use of the standard English approximant [ɹ] by the 20s, which contributes to an increasing distinction between /r/ and /l/ in L2 English. This is possibly explained by the increasing number of international programmes, schools, and universities in Thailand, which provide younger speakers of Thai with more opportunities to learn English from native speakers of English. As a result, it is more likely from the results that the amount of time to which the subjects have been exposed to English spoken by a native speaker is the more important factor. According to the generalised mixed effects logistic regression, the best-fit model shows that age in itself does not seem to be the main factor in the present study. However, age exhibits a significant interaction with other predictors to affect the likelihood of /r/-/l/ merger and is included in the model for L1 Thai and L2 English.

The effect of gender on /r/-/l/ merger in both languages is inconsistent. The factor of gender produces the order for the merger of /r/ and /l/, from higher to lower rates, in L1 Thai: females > males and in L2 English: males > females. The pattern found in L2 English corresponds to the hypothesis which suggests that females can be said to preserve the standard features more than males, but vice versa in L1 Thai. The unexpected findings for L1 Thai can

probably be attributed to Labov's (2001) 'Gender Paradox', which suggests that females tend to preserve the prestigious or standard features but sometimes are innovators of linguistic variation and change. As determined by the generalised mixed effects logistic regression, the effect of gender appears to be more important in L1 Thai than in L2 English, and in the latter the predictor of gender is excluded from the model of best fit.

Speech styles play different roles in the merger of /r/ and /l/ in the L1 and L2. In L1 Thai, the order of constraints favouring the merger of /r/ and /l/ from higher to lower rates is: RP > WL > NP > MP. The present study shows that native speakers of Thai become less careful when the style shifts from MP to NP, WL, and then RP. These findings fairly closely follow the prediction that the preservation of standard sounds is subject to degree of formality, in most to least formal contexts of MP > WL > RP > NP. The most formal task is predicted to yield the most frequent rates of distinction. The reason why the least formal NP style is found to be associated with awareness and retention of distinction is possibly explained by task sequencing. Moreover, the correct answers given to all pictures in the NP task concern the pronunciation of monosyllabic words. These two possible explanations offered, for this reason, might reflect potential limitations of the design of the present study. It might be suggested that the speakers of Thai are more aware of the need to avoid non-standard variant in formal speech but are less careful about standard variant preservation in informal contexts, with the exception here of NP. In L2 English, the hierarchy of the merger of /r/ and /l/ is: MP > WL > RP > NP, which in turn is completely in contrast to expectations. The least formal task promotes most distinction, while the most formal context facilitates non-standard forms. This might again be explained by the order in which the tasks are administered, the order being: NP > RP > WL > MP. As can be seen, the first task NP favours distinction, with the final task MP impeding /r/-/l/ distinction. In the first task, the speakers possibly make an attempt to retain distinction and later become more relaxed and increasingly produce the merger in subsequent tasks, resulting in the highest rates of merger in the final task. With regard to the generalised mixed effects logistic regression, speech style has an influence on the choice of merger in L1 Thai and L2 English and is included in the model for both languages.

The range of IELTS speaking scores of the ten respondents was between 5.5-6.5, which are then categorised into groups of 5s and 6s. It is expected in the present study that the 6s group will be more aware of the merger and will thus retain /r/-/l/ distinction. The findings confirm the prediction in the sense that, in both languages, the 6s are consistently more resistant to the application of /r/-/l/ merger than the 5s, resulting in a positive relationship

between language proficiency as based on IELTS speaking score and the preservation of /r/-/l/ distinction. So, the identical hierarchy for rates of the merger of /r/ and /l/ for IELTS speaking scores in L1 Thai and L2 English is: 5s > 6s. The model of best fit, as determined by the generalised mixed effects logistic regression, realises that IELTS speaking score does not account for variations in /r/-/l/ distinction and merger and is not included in the model of best fit in either the L1 or L2.

The summary of predicted and actual results in the hierarchy for rates of /r/-/l/ merger, from higher to lower rates, according to six predictors is summarised in Table 7.2.

Factor	Predicted results	Language	Actual results
Syllable stress	unstressed > stressed	L1 Thai	unstressed > stressed syllable
		L2 English	stressed > unstressed syllable
Preceding sound	preceding consonant > vowel > pause	L1 Thai	preceding consonant > vowel > pause
		L2 English	preceding consonant > vowel > pause
Age group	20s > 30s+	L1 Thai	20s > 30s+
		L2 English	30s+ > 20s
Gender	male > female	L1 Thai	female > male
		L2 English	male > female
Speech style	NP > RP > WL > MP	L1 Thai	RP > WL > NP > MP
		L2 English	MP > WL > RP > NP
IELTS speaking score	5s > 6s	L1 Thai	5s > 6s
		L2 English	5s > 6s

Table 7.2: Summary of results on the merger of /r/ and /l/ according to factors

As can be seen, three factors reach similar levels of statistical significance and are involved in the model of best fit in both L1 Thai and L2 English, including the linguistic factor of preceding sound and the extralinguistic predictors of age group and speech style. Gender, which makes up the significant predictor in L1 Thai, is not shown to have significant impact on the choice of utterance in L2 English. As evidenced, in addition to social constraints reported in previous research (Beebe 1974; Beebe 1980; Treyakul 1986; Chunsuvimol 1993; Pulsup 1993; Phootirat 2012; Panyaatisin 2013; Pookkawes 2014), the preceding segment also plays a role in the allophonic variation of /r/ and /l/ in Thai, which

also significantly affects the likelihood of /r/-/l/ merger in L2 English. In relation to the order of constraints favouring /r/-/l/ merger, only two factors contribute to the similar hierarchies towards the merger of /r/ and /l/ in both L1 and L2, from higher to lower rates: preceding sound, with consonant > vowel > pause, and IELTS speaking score, 5s > 6s.

The trends or situations of /r/-/l/ merger in the present study in comparison with the previous studies are explained in the next section.

7.2.4 Implications of the merger of /r/ and /l/ in Thai

The main aim of the present study is not sociolinguistic or variationist, but it focuses more on linguistic factors of L2 phonology acquisition. Although it does not draw any sociolinguistic conclusions, a variationist approach is used to identify trends and situations of the merger of /r/ and /l/ in Thai among ten Thai speakers. With regard to the merger of /r/ and /l/ according to the speakers, it is observed from Figure 7.1 that, in L1 Thai, there are three near categorical speakers out of ten. Two speakers, F and TP, exhibit a tendency towards the /r/-/l/ merger and another, M, towards /r/-/l/ distinction. However, interestingly, both of the subjects F and TP who favour merger in L1 Thai considerably distinguish /r/ and /l/ in L2 acquisition.

In L2 English, two subjects, PJ and PP, turn out to express the near categorical form with respect to /r/-/l/ merger. The similar pattern of speech production of speaker PJ in both L1 Thai and L2 English suggests that this speaker might prefer to retain the same production despite its non-standard status in both languages and this speaker does not become more conscious of avoiding the merger in L2 learning. For speaker PJ, it seems like the merger is not regulated by L2 acquisition at all. In contrast, speakers PA and PP increase the use of merger in L2 acquisition possibly because they have more difficulties in learning the prevocalic /r/ in L2 than in L1, so these two speakers modify the features towards /r/-/l/ merger which are relatively less marked. In other speakers, the production of merger declines when learning L2. For this reason, it might suggest that the majority of the speakers realise that merging /r/ and /l/ is unauthentic and more heavily non-standard in L2 English and thus make an attempt to distinguish /r/ and /l/ in L2 acquisition.

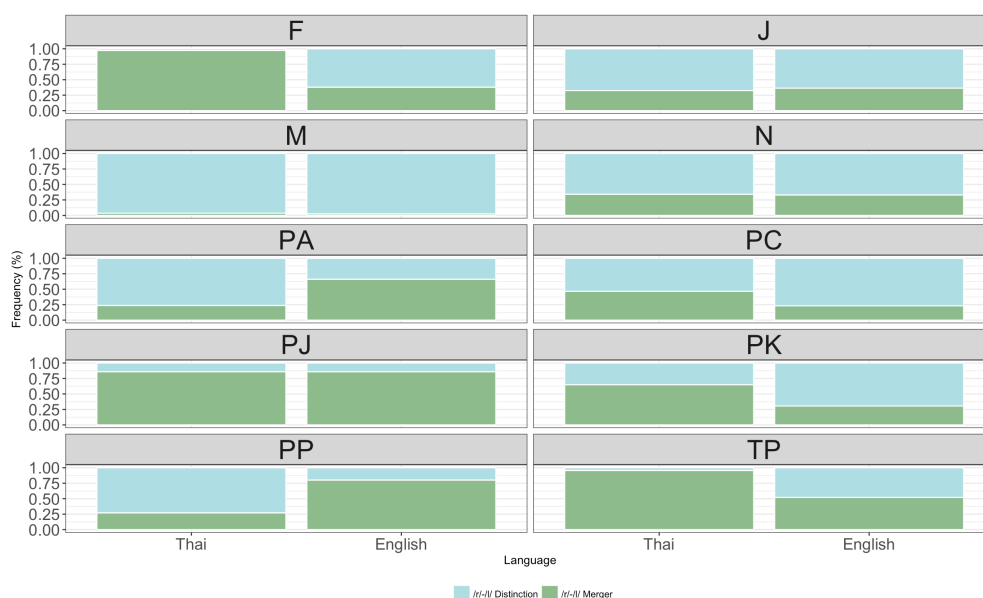


Figure 7.1: Prevocalic /r/: the merger of /r/ and /l/ in Thai and English according to speaker

As long as stylistic variation is taken into account, Table 7.3 illustrates the distribution of prevocalic /r/ variants in Thai. The production of the prevocalic /r/ in both initial and initial cluster in the most and least formal context of MP and NP respectively is reported. The lateral was employed at the highest rate in both phonological contexts of MP, at 39% in initial position and 37% of the time in initial cluster position. With regard to an initial /r/ in the least formal task of NP, the results showed that the speakers displayed only three variants which is the smallest range of variants. In NP, rates of production were quite similar. That is, the trill [r] was used at the highest rate of 36.67%, followed by the lateral [l] at 33.33%, and then flap [ɾ] at 30%. Interestingly, initial /r/ was realised as the trill [r] at the similar rates in both MP and NP. The /r/-cluster deletion occurred in MP and NP respectively 8.5% and 20% of the time.

Realisation	Reading minimal pair		Naming picture	
	Syllable-initial /r/ (200)	Syllable-initial cluster /r/ (200)	Syllable-initial /r/ (30)	Syllable-initial cluster /r/ (30)
Approximant [ɹ]	5.5% (11)	0.5% (1)		
Flap [ɾ]	18.5% (37)	23.5% (47)	30% (9)	16.67% (9)
Trill [r]	36.5% (73)	30.5% (61)	36.67% (11)	26.67% (11)
Lateral [l]	39% (78)	37% (74)	33.33% (10)	36.67% (10)
Deleted [Ø]		8.5% (17)		20% (12)
Other	0.5% (1)			

Table 7.3: Distribution of Thai prevocalic /r/ variants according to speech style

Table 7.4 below, adapted from Phootirat (2012: 129 and 131), shows the distributional pattern of initial /r/ and initial cluster /r/ in more and less formal tasks in existing research. While the decreasing use of the standard Thai flap [ɾ] and trill [r] found in the present study seems to follow the trend, the decline of /l/ substitution for /r/ is unexpected, and is empirically evidenced by the lower rates of 74.8% in Pookkawes's (2014) and 33.3% in the present study. According to the proportion found in Table 7.4 below, it can thus be seen that although native speakers of Thai are possibly gradually decreasing the production of standard Thai rhotics in formal contexts, which supports the conclusions of Treyakul (1986), Chunsuvimol (1993), Phootirat (2012), and Pookkawes (2014), subjects, in less formal situations, are perhaps becoming more conscious of avoiding the non-standard variants of [l] and deletion [Ø] since 2014 in Pookkawes's study and this trend is continuing up to until 2018 in the present study. As a result, the findings of the present study partly conflict with the results of Treyakul (1986), Chunsuvimol (1993), and Phootirat (2012) who suggest an increasing production of [l] substitution and /r/-cluster deletion [Ø] between 1986 and 2012. In comparison with previous studies, the considerable reductions in percentages of lateral [l]

and deletion [Ø] production found in the present study confirm the declining status of merger in informal contexts, which possibly turns out to be employed increasingly in higher register. The decreasing rates of use of both standard rhotics in formal context and non-standard variants in informal context suggest that native speakers of Thai are variable speakers who are becoming less conscientious in standard rhotic preservation in formal context and simultaneously avoid using the non-standard features in informal style.

Literature	More formal task	Standard Thai /r/ (flap [r] and trill [r])	Less formal task	Lateral [l]	Deletion [Ø]
Beebe (1974)	-	-	Interview		53%
Treyakul (1986)	Reading a minimal pair	100%	Interview	75%	62.4%
Chunsuvimol (1993)	-	-	Interview	91%	79.6%
Pulsup (1994)	-	-	Conversation	-	86.8%
Phootirat (2012)	Reading a word list	80%	Interview	96%	91.8%
Pookkawes (2014)	Reading a passage	64.2%	Interview	74.8%	62.4%
The present study (2018)	Reading a minimal pair	55%	Naming a picture	33.33%	20%

Table 7.4: Thai merger of /r/ and /l/: comparison of /r/ production according to speech style

However, a sharp decline of the lateral [l] and deleted [Ø] variants in the present study compared with previous research might be due to differences in the tasks completed by subjects. Naming a picture in the present study targets only monosyllabic words, so the level of awareness is possibly much greater than that operating in the interviews and conversations examined in previous research. Another possible reason for the different findings in comparison with some previous research could be related to the English proficiency of the respondents and their exposure to English. For example, the subjects in the studies by Chunsuvimol (1993), Phootirat (2012), and Pookkawes (2014) were resident in Thailand. On the other hand, the subjects in the present study were living in an English-speaking country. This could have a significant effect, either because these subjects have been regularly hearing UK pronunciation and speech patterns which do not merge /r/ and /l/, or because people who move to another country may also be more aware of language generally.

Regardless of speech style, the fact that the lateral [l] is the predominant variant in L1 Thai, as demonstrated in Table 6.1 of Chapter 6, shows that the merger to [l] continues to be accepted in Thai. In other words, a change in the use of the prevocalic /r/ is in progress.

However, the second and third most preferred variants, which are the trill [r] and flap [ɾ] respectively, confirm that standard Thai rhotics will not be abandoned by native speakers of Thai in the near future. Some speakers might still realise the expected appropriateness of standard sound maintenance, so that these two features will be preserved for longer. In addition, the present study does agree with Phootirat (2012: 129) in the sense that the complete /r/-/l/ merger will not occur soon given that isolated orthographic cues are still existing, especially in a minimal pair and word-list reading. This is confirmed by the less frequent use of /r/-/l/ merger in these two reading tasks. In this respect, /r/ and /l/ are in fact separate phonemes in Thai represented respectively by ‘ร’ and ‘ล’, and so speakers can notice the differences in the liquids easily, especially in isolated writing form. Perhaps this is a similar phenomenon to that which occurs with ‘th-fronting’ in English, in which some people pronounce ‘thin’ as ‘fin’ and ‘think’ as ‘fink’.

The results also indicate that Thai is one of the Tai languages which for a long time have undergone cluster reduction, and especially with the /r/ cluster so that no /r/ cluster remained in most languages (Yodmongkhon 2000). It should be noted that Proto-Tai is the ancestor of the Tai languages. The Tai family includes languages such as Siamese (Thai), Ahom, Shan, Lao, Lue, White Tai, Tay, Tho, Nung Ddoi, Po-ai, Saek, and Wu-ming. According to Yodmongkhon, /r/ as an initial cluster member was likely to be omitted in most of these languages, with the exception of Saek, which more frequently preserves the consonant cluster. In Ahom and Siamese or Thai, /r/ in an initial cluster was occasionally maintained. In Wu-ming, /r/ as an initial cluster member was usually deleted, while its initial cluster /l/ was retained. Thus, it has been suggested that Thai is also moving towards this trend of cluster simplification in which the liquid was deleted.

To conclude, this section has presented a discussion of the present study’s findings. It reveals that the merger of /r/ and /l/ has been occurring and is still present in the speech of present day speakers in Thai, despite lower rates of merger production compared with previous research. Nevertheless, native speakers of Thai are more successful in preserving the /r/-/l/ distinction in L2 English than in L1 Thai, suggesting that L2 learners are more aware of maintaining the standard variants of the prevocalic /r/ when acquiring L2 English.

The next section summarises the conclusions of the present study.

7.3 Conclusions

Thai has separate phonemes for liquids, including the flap [ɾ] and trill [r] as rhotics and the lateral [l]. Although both the flap [ɾ] and trill [r] are standard rhotics in Thai (Tingsabadh and Abramson 1993; Harris 1996), it is generally found that the flap [ɾ] and the trill [r] convey different stylistic meanings. In English, the approximant [ɹ] and the lateral [l] form the standard liquids. For this reason, Thai and English have different rhotics but share the same lateral [l]. It has been the case in Thai that the separate phonemes /ɾ/ and /l/ may be variably merged and sound identical to [l]. In addition to the replacement of /ɾ/ with [l] in both the initial phoneme and initial cluster, the deletion of either /ɾ/ or /l/ as a cluster member is also associated with the merger of /ɾ/ and /l/ (Phootirat 2012: 132).

In the present study, the data reported are based on 2350 observations: 1140 and 1210 cases in L1 Thai and L2 English respectively gathered from ten native speakers of Thai. The data was elicited in contexts of different degrees of formality reflected in four speech tasks. Tasks considered are picture-naming task as well as three text-based tasks, including reading a passage, reading a word list, and reading a minimal pair which are taken to represent the least to most formal styles respectively. Three main primary aims are central aspects of the present study. It firstly aims to demonstrate the validity of the Markedness Differential Hypothesis (MDH) in predicting difficulties in L2 acquisition. The second aim is to investigate how the linguistic constraints of markedness and transfer affect the acquisition of the prevocalic /ɾ/ in L2 English. In terms of the markedness approach, the markedness hierarchy of the liquids assumes the following scale, where the most marked is at the left-hand edge (Maddieson 1984):

approximant [ɹ] > flap [ɾ] > trill [r] > lateral [l]

As can be seen, the phonological variant of /ɾ-/l/ merger appears to be partly based on the modification towards the unmarked. The MDH is demonstrated by investigating the speech production of the prevocalic /ɾ/ in the L2.

The third focus of attention is an investigation according to the principle of multiple causes (Young and Bayley 1996), which proposes that a particular variant is evoked by multiple factors. For this reason, linguistic and extralinguistic constraints are explored. In this respect, six factors of linguistic (syllable stress and preceding sound) and extralinguistic (age, gender, speech style, and IELTS speaking score) factors are taken into consideration in investigating what predictors influence the merger of /ɾ/ and /l/. The *glmer()* command of the

R Studio lme4 package (Bates and Maechler 2009) is used to conduct a mixed regression analysis taking more than one fixed and random effects related to individual speakers and words into account.

The present study was conducted to answer four research questions. In comparing speech production in L1 Thai and L2 English, it is revealed that the most predominant variants in L1 Thai and L2 English are respectively the lateral [l] and approximant [ɹ], as discussed in Figure 6.8 of Chapter 6. The prevocalic /r/ in L1 Thai is produced from higher to lower rates in the following hierarchy:

lateral [l] > trill [r] > flap [ɾ] > deletion [Ø] > approximant [ɹ]

The order of speech production in L2 English is:

approximant [ɹ] > lateral [l] > deletion [Ø] > flap [ɾ] > trill [r]

In other words, the replacement of /r/ with /l/ is also selected in L2 acquisition as the second most preferred variant followed by cluster deletion [Ø] in the third rank overriding the production of the standard Thai rhotics of flap [ɾ] and trill [r].

As to the research question 1) of whether or not the MDH was able to predict and explain the errors subjects make in learning L2 English, overall speech production in L2 English was found to support the MDH. Although the approximant [ɹ] turned out to be selected as the predominant variant, the use of the English approximant [ɹ] in L2 English was approximately one-third of the time from the overall production. The research question 1.1) explored whether the patterns of acquisition and the difficulties associated with certain forms correspond to the markedness relations between L1 and L2. It was found that difficulties in L2 acquisition were not directly related to degree of markedness. This is because the English approximant [ɹ], regarded as the most marked and so most difficult feature, was produced at the highest rate in comparison with the other four variants transferred from L1 Thai. As evidenced, the results contradicted the prediction of the MDH. It thus suggested that the MDH could not predict the relative degree of difficulty on the basis of relative degree of markedness. As a result, it is worth mentioning here that markedness theory cannot completely predict and explain the patterns identified, and so other approaches such as Flege's (1995) SLM as well as Best and Tyler's (2007) PAM-L2 might add insights into the findings.

The research question 1.2) investigates which features are more likely to be transferred to L2 English. With regard to the markedness approach, five variants are grouped into three categories according to markedness and standard status in L1 and L2: unmarked [l] and deletion [Ø], the marked flap [ɾ] and trill [r], and the marked approximant [ɹ]. The three rhotics are in different groups because the flap [ɾ] and trill [r] are standard rhotics in L1 Thai, but the approximant [ɹ] is a standard English rhotic. As illustrated in Figure 6.9 of Chapter 6, markedness is a factor in speech production in both languages, with the modification towards the unmarked exerting a stronger influence in L1 Thai than in L2 English. This is because unmarked variants were adopted at a higher rate in L1 Thai than in L2 English. In other words, the modification towards the unmarked [l] and deleted [Ø] variants seems to play a more prominent role in the production of the prevocalic /r/ in L1 Thai, with approximately a half of the modifications being attributed to the production of the unmarked features.

In L2 acquisition, according to the MDH, the unmarked features are easier to acquire than the relatively more marked variants. According to the results found in L2 English, a considerable increase in production of the standard English approximant [ɹ] is potentially a sign of L2 acquisition development due to the emerging L2 repertoire. The subjects are more self-conscious in using the standard variant of the approximant [ɹ] than when acquiring the prevocalic /r/ in L1 Thai. Interestingly, unmarked deletion [Ø] is found to occur in L2 English at a higher rate than in L1 Thai. As evidenced, the results rather confirm the apparent role of L1 transfer and markedness, as the majority of the sounds the speakers produce in the L2 are transferred from L1 Thai, with greater percentages of unmarked [l] and deletion [Ø] production compared with use of the more marked flap [ɾ] and trill [r]. It thus seems that the effect of markedness overrides L1 transfer of standard Thai rhotics when the speakers acquire the prevocalic /r/ in the L2 English. MDH has been shown to be effective in explaining why subjects transferred unmarked lateral [l] and deleted [Ø] features rather than the more marked yet standard Thai rhotics of the flap [ɾ] and trill [r].

In relation to the third focus in the present study, the statistical results illustrate the effects of linguistic and extralinguistic factors on the merger of /r/ and /l/. It should be noted again that the phonological process of /r/-/l/ merger in Thai involves two phonological processes, including the lateralisation of /r/ and, as an initial cluster, the complete deletion [Ø] of the cluster member, either /r/ or /l/ (Phootirat 2012: 132). In the latter case, an initial cluster CCV will be pronounced as a simple onset CV. Once all six factors have been taken into account, the best-fit model, as determined by the generalised mixed effects logistic regression, shows that the predictors of preceding sound and an interaction of age group, gender, and

speech style exert significant effects on the variation in L1 Thai, and so the syllable stress and IELTS speaking score are not included in the model of best fit. For L2 English, it is found that merger is no longer influenced by gender. As a result, the three factors of preceding segment, age group, and speech style have a similarly strong influence on the choice of variant in prevocalic /r/ of L1 Thai and L2 English.

The next section describes the limitations of the present study and offers suggestions for future research.

7.4 Limitations and suggestions for future research

The present study has shown some avenues of research that future study can explore. The limitations found will also imply suggestions for future scholars. Firstly, a more in-depth and clearer picture might be provided if future researchers focused on the qualitative investigation of phonetic characteristics or measuring the formants of the variants used. It is also recommended that future scholars should pay greater attention to coarticulation effects, exploring for example how other potential factors related to linguistic constraints affect variation, such as the length and quality of vowels, and types of articulation of consonants before and after /r/. Another suggestion is to increase the sample size number of respondents, which was quite low in the present study due to a limited number of Thai students living in Newcastle upon Tyne, UK. The small dataset in the present study can affect the ability to generalise from the results. For this reason, a larger sample of participants might be more appropriate to completely generalise the findings. Comparing how native speakers of Thai in other dialects, such as northern, north-eastern, or southern forms, might also contribute to insightful results according to the effect of dialect on sound variation in /r/. It is also worth noting that, in terms of methodological quality, as long as stylistic variation is taken into account, the informal context of interviews may be more suitable than tasks such as naming pictures, where speech production is more carefully monitored by speakers. Of course, some findings might be related to task sequence effects and, in future similar studies, it might be better to randomly sequence the order of the tasks. Taking into account of the limitations of the present study might be useful for future researchers focusing on a similar area. It is hoped that more researchers can be encouraged to further study the situation of the /r/-/l/ merger in Thai in order to more fully understand the change in progress in the use of this phonological variation.

APPENDIX A: Stimuli in L1 Thai

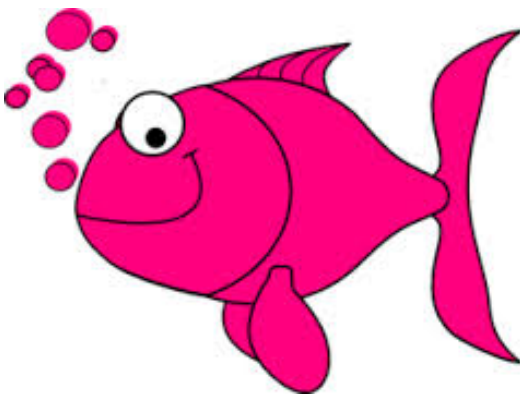
1. Picture naming



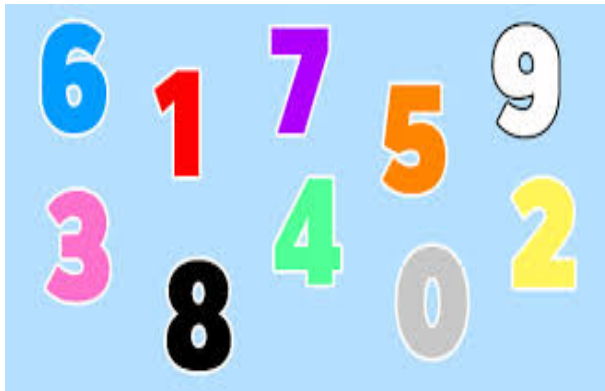
พลุ /p^hlú/ ‘fireworks’



ร่ม /rôm/ ‘umbrella’



ปลา /plā:/ ‘fish’



4.

เลข /lê:k/ 'number'



5.

กล้วย /klû:aj/ 'banana'



6.

รถ /rót/ 'car'



7.

ลارب /lâ:p/ 'spicy minced meat salad'



8.

พริก /p^hrik/ 'chilli'



9.

เหล็ก /lèk/ 'iron'



10.

กรวย /**krū**:aj/ 'cone'



11.

พระ /**p^hr**á/ 'Buddhist monk'



12.

แรด /**r**êt/ 'rhino'

2. Passage reading

ประเพณี/prà.p^hē.nī:/กิน/kīn/เจ/cē:/ของ/k^hั๋ง/ชาว/c^hā:w/จีน/cī:n/

Chinese Vegetarian Festival

เหตุการณ์/hè:t.kā:n/อัน/ān/เป็น/pēn/มงคล/mōng.k^hōn/ประจำปี/prà.cām.pī:/จัด/càt/ว่า/wā:/เป็น/pēn/
การ/kā:n/ฉลอง/c^hà.lǎ:ng/ที่/t^hī:/สวยงาม/sǔ:aj.ŋā:m/และ/lé/นำ/nā:/ตื่นเต็น/tuē:n.tēn/มาก/mā:k/ที่/t^hī:/สุด/sùt/
ซึ่ง/sūng/จะ/cà/มี/mī:/ขึ้น/k^hūn/ใน/nāi/ช่วง/c^huāng/เก้า/kā:w/วัน/wān/แรก/rē:k/ของ/k^hั๋ง/เดือน/dūan/
เก้า/kā:w/ตาม/tā:m/ปฏิทิน/pà.tì.t^hīn/จีน/cī:n/พิธี/p^hī.t^hī:/เก้า/kā:w/วัน/wān/นี้/ní:/ตาม/tā:m/ปกติ/pà.kà.tì/
ก็/kō:/จะ/cà/มี/mī:/ขึ้น/k^hūn/ใน/nāi/ราว/rā:w/ปลาย/plā:j/เดือน/dūan/กันยายน/kān.jā:.jōn/หรือ/rǔ:/ไม่/māi/
ก็/kō:/ต้น/tōn/เดือน/dūan/ตุลาคม/tù.lā:.k^hōm/

This annual auspicious event is a most colourful and dramatic celebration which takes place during the first nine days of the ninth lunar month of the Chinese calendar. The 9-day event is usually in late September or early October.

ต้นกำเนิด/tōn.kām.nǐ:/ของ/k^hั๋ง/ประเพณี/prà.p^hē.nī:/นี้/ní:/ไม่/māi/ปรากฏ/prā:kòt/แน่ชัด
/nē:.c^hát/ แต่/tè:/ก็/kō:/มี/mī:/การ/kā:n/เล่า/lāw/กัน/kān/มา/mā:/ว่า/wā:/ประเพณี/prà.p^hē.nī:/กิน/kīn/เจ/cē:/
นี้/ní:/เกิดขึ้น/kè:t.k^hūn/ใน/nāi/ภาคตะวันออกเฉียงใต้/p^hā:k.tà.wān.wè:k.c^hāng.tāj/ของ/k^hั๋ง/ประเทศ/prà.t^hē:t/จีน
/cī:n/ใกล้/klāi/กับ/kàp/มณฑล/mōn.t^hōn/ฟูเจี้ยน/fū:.cīan/การ/kā:n/ฉลอง/c^hà.lǎ:ng/พิธี/p^hī.t^hī:/นี้/ní:/จัด/càt/
ให้/hāi/ มี/mī:/ขึ้น/k^hūn/ก็/kō:/เพื่อ/p^hūa/รักษา/rák.sǎ:/ชีวิต/c^hī:.wít/สัตว์/sàt/ต่างๆ /tà:ng.tà:ng/ให้/hāi/
รอดพ้น/rò:t.p^hōn/จาก/cà:k/การ/kā:n/ถูก/t^hù:k/ฆ่า/k^hā:/เป็น/pēn/อาหาร/ā:.hǎ:n/

The origin of the festival is unclear. However, it has been passed from generation to generation that it originated in the south-eastern part of China near Fujian Province. The festival was celebrated to make merit and save animals from being killed for food.

ใน/nāi/ประเทศ/prà.t^hē:t/ไทย/t^hāi/ประเพณี/prà.p^hē.nī:/กิน/kīn/เจ/cē:/ที่/t^hī:/มี/mī:/การกล่าวขวัญ
/kā:n.klā:w.k^hwǎn/กัน/kān/มาก/mā:k/ที่/t^hī:/สุด/sùt/ก็/kō:/คือ/k^hū:/ที่/t^hī:/จังหวัด/cāng.wàt/ภูเก็ต/p^hū:.kèt/ใน
/nāi/ภาคใต้/p^hā:k.tāj/ ซึ่ง/sūng/พิธี/p^hī.t^hī:/อัน/ān/เป็น/pēn/มงคล/mōng.k^hōn/นี้/ní:/ จะ/cà/จัด/càt/ขึ้น/k^hūn/
อย่าง/jà:ng/ใหญ่โตมโหฬาร/jàj.tō:.mà.hǒ.lā:n/ใน/nāi/ระหว่าง/rá.wà:ng/เวลา/wē:.lā:/เก้า/kā:w/วัน/wān/นี้/ní:/
ชาว/c^hā:w/จีน/cī:n/ผู้ลี้ภัย/p^hū:.lūam.sǎj/ใน/nāi/ศาสนา/sà:t.sà.nǎ:/พุทธ/p^hút/จะ/cà/แต่งกาย/tèng.kā:j/ใน
/nāi/ชุด/c^hút/สี/sī:/ขาว/k^hā:w/ หัน/hǎn/ไป/pāi/กิน/kīn/เจ/cē:/และ/lé/ปฏิบัติ/pà.tì.bàt ตาม/tā:m/กฎ/kòt/
สิบ/sip/ข้อ/k^hั๋ง/ เพื่อ/p^hūa/ให้/hāi/จิตใจ/cìt.cāj/และ/lé/ร่างกาย/rā:ng.kā:j/ของ/k^hั๋ง/ตน/tōn/บริสุทธิ์/bò.rí.sùt/

In Thailand, the most talked-about vegetarian festival is in Southern Province of Phuket where the auspicious ceremony is held in a grand celebration. During the 9-day

period, the devout Chinese Buddhists dress in white attire, convert to vegetarians and observe the ten rules in order to purify their minds and bodies.

นอก/nô:k/จาก/cà:k/จะ/cà:/มี/mī:/การ/kā:n/กิน/kīn/เจ/cē:/อย่าง/jà:η/**เคร่งครัด/k^hrêη.k^hrát**/และ/lé:/ทำ
/t^hām/บุญ/bū:n/ใน/nāj/วัน/wān/นี้/ní:/แล้ว/lé:w/จุดเด่น/cùt.dèn/ของ/k^hว้η/งาน/ηā:n/เก่า/kǎ:w/วัน/wān/นี้/ní:/
จะ/cà:/รวม/rū:am/ไป/pāj/ถึง/t^hũη/การ/kā:n/ทรมาน/t^hว้:rá.mā:n/ร่างกาย/rā:η.kā:j/ตนเอง/tōn.ēη/อัน/ān/
เหลือเชื่อ/lũa.c^huâ/ต่างๆ /tà:η.tà:η/ นานา/nā:.nā:/ เช่น/c^hên/ การ/kā:n/ไต่/táj/บันได/bān.dāj/ มี/mī:/การ
/kā:n/เดิน/dī:n/ลุย/lūj/ กองไฟ/kō:η.fāj/ พิธี/p^hí.t^hī:/เดิน/dī:n/ข้าม/k^hā:m/สะพาน/sà.p^hā:n/ และ/lé:/ขบวน
/k^hà.būan/แห่/hè:/ไป/pāj/ตาม/tā:m/ท้องถนน/t^hว้η.t^hà.nǎn/ซึ่ง/sũη/ร่างกาย/rā:η.sōη/จะ/cà:/มี/mī:/แก้ม/kē:m/
ถูก/t^hù:k/แทง/t^hē:η/ทะลุ/t^há.lú/และ/lé:/มี/mī:/ร่างกาย/rā:η.kā:j/ปักพฤษ/pàk.p^hrũn/ไป/pāj/ด้วย/dúaj/ของ/k^hว้η/
มี/mī:/คม/kōm/นานับชนิด/nā:.náp.c^há.nít/

Besides a strict vegetarian diet and temple offering, some highlights of the 9 – day event include incredible acts of self – mortification such as climbing knife – blade ladders, walking on hot coals, a ritual of bridge – crossing and a street – procession in which the mediums in a state of trance have their cheeks pierced and bodies spiked with various types of sharp objects.

บรรยากาศ/bān.jā:.kà:t/ทั่วไป/túa.pāj/จะ/cà:/เต็ม/tēm/ไป/pāj/ด้วย/dúaj/ความ/kwā:m/โกลาหล
/kō:.lā:.hōn/ที่/t^hī:/เป็น/pēn/มงคล/mōη.k^hōn/พร้อม/p^hróm/ทั้ง/t^hāη/เสียง/sīaη/ดัง/dāη/จน/cōn/หู/hū:/แทบ
/t^hē:p/แตก/tè:k/ของ/k^hว้η/ประทัด/prà.t^hát/และ/lé:/การ/kā:n/แห่/hè:/มังกร/māη.kō:n/ใน/nāj/ตอน/tō:n/เซ็น/jēn/
ของ/k^hว้η/พิธี/p^hí.t^hī:/วัน/wān/สุดท้าย/sùt.t^hā:j/ถนน/t^hà.nǎn/สาย/sǎ:j/สำคัญ/sām.kān/ของ/k^hว้η/เมือง/mūaη/
ภูเก็ต/p^hū:.kèt/จะ/cà:/กลาย/klā:j/สภาพ/sà.pā:p/เป็น/pēn/ถนน/t^hà.nǎn/ที่/t^hī:/ก็ก๊อง/kuək.kōη/ไป/pāj/ด้วย/dúaj/
เสียง/sīaη/และ/lé:/ปกคลุม/pòk.k^hlũm/ไป/pāj/ด้วย/dúaj/ควัน/kwān/จาก/cà:k/ประทัด/prà.t^hát/ ชาว/c^hā:w/เมือง
/mūaη/ ทั้ง/t^hāη/หมด/mòt/ต่าง/tà:η/ก็/kō:/พา/p^hā:/กัน/kān/เข้าร่วม/k^hāw.rū:am/ใน/nāj/พิธี/p^hí.t^hī:/นี้/ní:/
นักท่องเที่ยว/nák.t^hv̄η.t^hīaw/ที่/t^hī:/มา/mā:/เมือง/mūaη/ไทย/t^hāj/ไม่/mâj/ควร/k^hūan/พลาด/p^hlâ:t/โอกาส/ō:.kà:t/
ไป/pāj/เยือน/jūan/ภูเก็ต/p^hū:.kèt/ใน/nāj/ช่วง/c^huāη/มี/mī:/พิธี/p^hí.t^hī:/อัน/ān/เป็น/pēn/มงคล/mōη.k^hōn/นี้/ní:/

The entire atmosphere is full of religious frenzy with the ear - splitting sound of firecrackers and lion dances. In the evening of the last day event, the main road of Phuket Town is turned into a path of din and smoke of firing crackers. All the local residents participate in the event. Visitors to Thailand should not miss an opportunity to visit Phuket during the auspicious event.

The reading passage is taken from:

http://www.smartenglishkid.com/index.php?lay=boardshow&ac=webboard_show&WBntype=1&Category=sma
rtenglishkidcom&thispage=1&No=1239307

3. Word-list reading

1. รั้ลือ /rām.lū:/ ‘to rumour’
2. เกรงกลัว /krē:ŋ.klū:a/ ‘be afraid’
3. ส่งเสริม /sòŋ.sǎ:m/ ‘to support’
4. ชัดเจน /c^hát.cē:n/ ‘be clear’
5. เลิกรา /lǐ:k.rā:/ ‘be separated’
6. จัดแจง /càt.cē:ŋ/ ‘to manage’
7. บ้านช่อง /bā:n.c^hōŋ/ ‘house’
8. ปลอดโปร่ง /plò:t.prò:ŋ/ ‘be clear’
9. คราคร่ำ /k^hrā:.k^hrām/ ‘be crowded with’
10. ปั่นป่วน /pàn.puàn/ ‘be confusing’
11. จับกุม /càp.kūm/ ‘to arrest’
12. รวบรวม /rū:ap.rū:am/ ‘to collect’
13. เสื้อผ้า /sū:a.p^hā:/ ‘clothes’
14. ทัดทาน /t^hát.t^hā:n/ ‘to prohibit’
15. ล่องลอย /lōŋ.lō:j/ ‘to draft’
16. โคลงเคลง /k^hlō:ŋ.k^hlēŋ/ ‘to sway’

4. Minimal pair reading

- | | |
|--|---|
| 17. ราก /râ:k/ ‘root’ | พากย์ /p ^h â:k/ ‘to narrate’ |
| 18. พัก /p ^h ák/ ‘to break’ | ลัก /lák/ ‘to steal’ |
| 19. รา /rā:/ ‘fungus’ | ลา /lā:/ ‘donkey’ |
| 20. รวง /rū:ŋ/ ‘hive’ | พวง /p ^h ū:ŋ/ ‘string’ |
| 21. ฐูป /t ^h û:p/ ‘incense stick’ | ดูบ /lû:p/ ‘to grope’ |
| 22. เรือน /rū:an/ ‘house’ | เลือน /lū:an/ ‘be dim’ |
| 23. ครั่ง /k ^h rân/ ‘lac’ | คลั่ง /k ^h lân/ ‘be crazy’ |
| 24. กรอง /krō:ŋ/ ‘to filter’ | กลอง /klō:ŋ/ ‘drum’ |
| 25. บาง /bā:ŋ/ ‘be thin’ | กาง /kā:ŋ/ ‘to stretch’ |
| 26. ปลง /plōŋ/ ‘to accept’ | ปรง /prōŋ/ ‘a plant of the genus Cycas’ |
| 27. ทาย /t ^h ā:j/ ‘to guess’ | ทราย /sā:j/ ‘sand’ |
| 28. พลุ /p ^h lú/ ‘firework’ | พรุ /p ^h rú/ ‘crust of soft earth’ |

APPENDIX B: Stimuli in L2 English

1. Picture naming



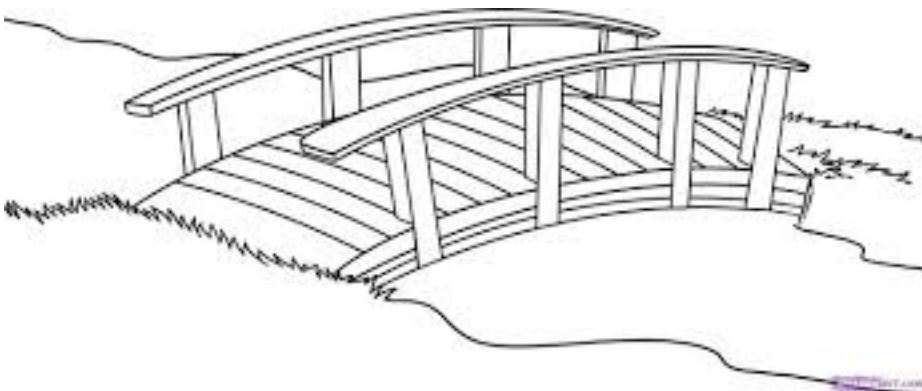
1.

(ring)



2.

(gloves)



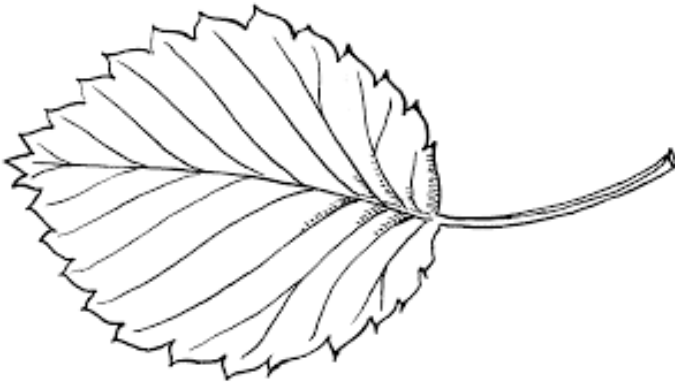
3.

(bridge)



4.

(clock)



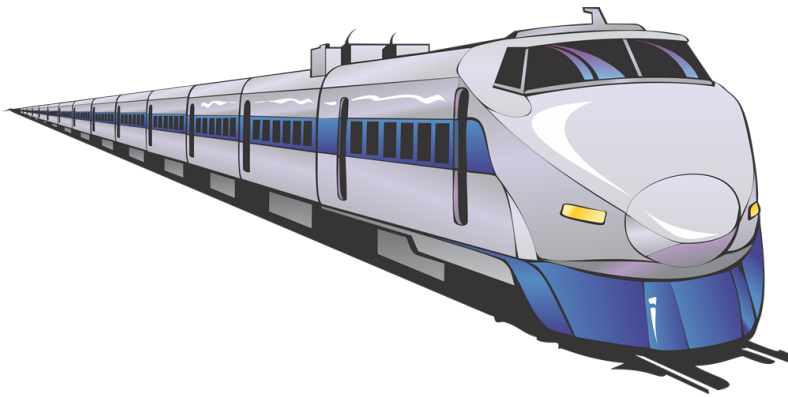
5.

(leaf)



6.

(lime)



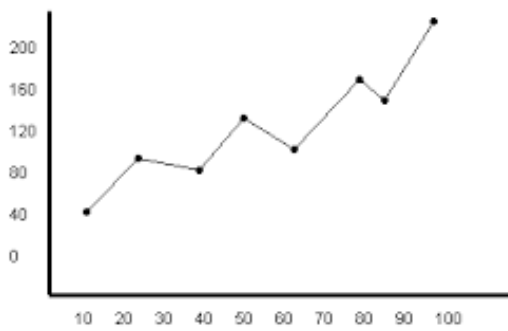
7.

(train)



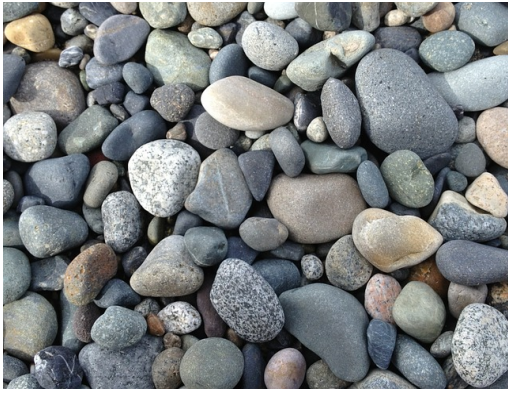
8.

(plane)



9.

(graph)



10.

(rock)



11.

(rose)



12.

(leg)

2. Passage reading

Art Classes for Children

For early learners, art classes vary between those that have directed activities and those that have free form activities. An example of a directed activity would be drawing a rabbit with circles that indicate parts of the rabbit's body. Another example would be to draw a road by a rocky river in rainy weather.

Even harder yet, learners could draw a still life of a room with a round rug and bread on a nearby table or a horse that runs through the morning fog. Such realistic classes teach the patterns of lines and the power of working with dimension. When art teachers prefer more free form activities, there are many choices.

You can ask learners to respond to a mathematical problem with interesting colors and clear pictures, but no numbers. You can ask learners to produce a short story in pictures that show characters both near and far. Children can draw dreams that they remember or vacation travels from their early years.

The reading passage is taken from: <https://www.rong-chang.com>

3. Word-list reading

29. easy

30. flip-flop

31. beauty

32. rreally

33. many

34. lurid

35. **break**through

36. knitting

37. bias

38. **dr**y-clean

39. custom

40. rerun

41. extend

42. lovely

43. playground

44. postpone

4. Minimal pair reading

45. mode road

46. vend lend

47. leg beg

48. room root

49. long song

50. lay ray

51. climb crime

52. bloom broom

53. beat bean

54. play pray

55. boom zoom

56. flog frog

57. tool pool

58. pain main

59. deal heal

60. bar car

61. head bed

62. poor door

APPENDIX C: Questionnaire

Questionnaire

1. Age: _____years
2. Gender: Man / Woman
3. Academic degree: _____
4. IELTS score (speaking): _____
5. Which province do you live in Thailand? _____
6. Occupation in Thailand: _____
7. The length of stay in the UK: _____years _____months
8. The length of formal education in English in Thailand: _____years _____months
9. The length of formal education in English in the UK: _____years _____months
10. What major are you studying? _____
11. Did you first study English with a Thai teacher (T) or a native English speaker (E)? T / E
12. Have you ever studied English with a native English speaker? Yes / No
13. Do you watch/ listen to any British TV programmes/ UK radio? Yes / No
14. If yes, please specify which program: _____
15. If yes, how many hours per week? _____

APPENDIX D: Consent form

Consent form



School of English Literature,
Language and Linguistics,
Percy Building,
Newcastle upon Tyne,
NE1 7RU, UK

The interviewer will have already given you a 'Description Sheet' stating the purpose of the interview. If you are still willing to participate having read this, it would be helpful if you could start the interview by providing some background information about yourself to the researcher who is interviewing you once you have both signed and dated this form below.

AGREEMENT

I agree to participate and allow the recording of my voice and accompanying material to be used for the purpose of research analysis. I understand that my participation is voluntary and that I have the option to decline further cooperation at any time during the interview.

Signature of Interviewer: _____

Signature of Interviewee: _____

Date of Interview: _____

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