

Table of Contents

Acknowledgements.....	iv
Table of Contents.....	vi
List of Tables.....	ix
List of Figures.....	x
Chinese Abstract	xiii
English Abstract.....	xiv
Chapter	
1. Introduction	1
1.1 Background and Motivation.....	1
1.2 Literature Review	3
1.2.1 The tonal system of Mandarin Chinese.....	3
1.2.2 Rising T2 in Taiwan Mandarin	5
1.2.3 T2 variations in Taiwan Mandarin.....	7
1.2.4 Illustrations of T2 variations in TM	10
1.3 Research Questions.....	11
1.4 Thesis Organization.....	12
2. Methodology	13
2.1 Overview of the Experiments.....	13
2.2 Subjects	13
2.3 Variables.....	16
2.3.1 Sociolinguistic variables.....	16
2.3.1.1 Language background.....	16
2.3.1.2 Gender.....	17
2.3.1.3 Regions.....	17
2.3.2 Linguistic variables.....	18
2.3.2.1 Vowel qualities.....	18

2.3.2.2 Tonal environments	18
2.3.2.3 Sentence positions.....	19
2.4 Materials.....	20
2.4.1 Experiment 1: T2 in isolated words.....	21
2.4.2 Experiment 2: Final T2 in disyllabic expressions.....	22
2.4.3 Experiment 3: Final T2 of disyllabic expressions in different sentence positions.....	22
2.5 Procedure	23
2.6 Equipment	24
2.6.1 Hardware	24
2.6.2 Software	24
2.7 Measurement and Categorization	25
2.7.1 Auditory judgment	25
2.7.2 Machine Reading and Reliability Test	29
2.7.3 Types of T2 variations	30
3. Results	32
3.1 Experiment 1: T2 in Isolated Words	32
3.1.1 The distribution of the tonal types in isolated words	32
3.1.2 T2 with different vowels	34
3.1.3 Language backgrounds and T2 variations	37
3.1.4 Genders and T2 variations	38
3.2 Experiment 2: Final T2 in Disyllabic Expressions	38
3.2.1 The distribution of the tonal types in disyllabic expression	39
3.2.2 T2 with different preceding tones	40
3.2.3 Language background and T2 variations	42
3.2.4 Genders and T2 variations	43
3.3 Experiment 3: Final T2 of Disyllabic Expressions in Different Sentence Positions	44
3.3.1 The distribution of the tonal types in the sentence level	45
3.3.2 Final T2 in different sentence positions	46
3.3.3 Language Background and T2 variation	47
3.3.4 Genders and T2 variations	48
3.4 T2 Variations and Regional Differences Among the Bilinguals	50
3.5 Summary	54
4. Discussion	58
4.1 The Dominant Variant: Level Tone	58

4.2 T2 Variations in Tw-TM Bilinguals and TM Monolinguals.....	62
4.3 The Other Factors that Affect T2 Variations	67
4.3.1 The social factors: genders, regions	67
4.3.1.1 The effect of Genders	67
4.3.1.2 The limited effect of the regions	69
4.3.2 The linguistics factors: the vowels, the preceding tones and the sentence positions	71
4.3.2.1 Vowels	71
4.3.2.2 The preceding tones	72
4.3.2.3 Sentence positions	73
4.4 The T2 Variation as a Trend in TM	74
5. Conclusion	76
5.1 Summary	76
5.2 Contribution of This Study	78
5.3 Limitation and Further Studies	79
Appendixes	
1. The subject information of the TM monolinguals	81
2. The subject information of the Tw-TM bilinguals	82
3. Examples of the materials on the PowerPoint	83
4. The materials (T2 in isolated words) used in Experiment 1	84
5. The materials (final T2 in disyllabic expressions) used in Experiment 2	85
6. Materials used in Experiment 3: Final T2 of disyllabic expressions in sentence-medial & final position	87
7a. Sample for subject background sheet (Chinese)	90
7b. Sample for subject background sheet (English Translation).....	91
8. The row tokens of each variable in Experiment 1	93
9. The row tokens of each variable in Experiment 2	94
10. The row tokens of each variable in Experiment 3	95
Bibliography	96

List of Tables

Table 1 Chao'S (1968: 26) tonal representation system of Mandarin Chinese.....	4
Table 2 The row tokens of NR, LR and Level in isolated words.....	33
Table 3 The percentage of the three tonal types in different vowels.....	36
Table 4 The percentage of tonal types in monolinguals and bilinguals.....	37
Table 5 The distribution of lr an level in two genders	38
Table 6 The percentage of the three types of t2 with different preceding tones.....	41
Table 7 The distribution and percentage of LR and Level	42
Table 8 The distribution and percentage of the three tonal types in different language backgrounds	43
Table 9 The distribution and the percentage of each tonal type in the two genders...	43
Table 10 The frequency and percentage of LR and Level in the two genders.....	44
Table 11 The distribution of NR and the variation in the two positions	47
Table 12 The distribution of NR, LR an Level in the two positions	47
Table 13 The distribution of the three tonal types within each language background	48
Table 14 The distribution of monolinguals and bilinguals in LR and Level.	56
Table 15 The comparison of prescriptive and descriptive tonal system of isolated syllables in TM. Each asterisk indicates one token of the designated tonal scale (Fon & Chiang, 1999).....	59
Table 16 The tonal system of the standard Mandarin (Chao, 1968).....	64

Table 17 The tonal system of Taiwanese (Tsao,2000, Chung,2002 and Lu, 2003).....	65
Table 18 The comparison between TM Yang-ping and Tw Yang-ping.....	65

List of Figures

Fig. 1 The sentence “yie3 yiou3 ren2 tsu2” (“There is also the human species”) by Southern-Min speakers	7
Fig. 2 The sentence “yie3 yiou3 ren2 tsu2” (“There is also the human species”) by non-Southern-Min speakers	8
Fig. 3 Possible contour types of TM T2	10
Fig. 4 The normal rising T2 :the “ti2” (題) in “zhuan1 ti2” (專題) (“project”)	26
Fig. 5 The normal rising T2 : the “qi” 擊 in “mu4 qi2” (目擊) (“witness”).....	26
Fig. 6 The mid-level T2: the “qi2” (擊) in “quan2 qi2” (拳擊) “boxing”	27
Fig. 7 The mid-level T2: the “tu2” (圖) in “di4 tu2” (地圖) “map”	27
Fig. 8 The low-rising T2: the “tu2” (途) in “chang2 tui2” (長途) “long-distance”....	28
Fig. 9 The low-rising T2: the “du2” (獨) in “gu1 du2” (孤獨) “solitary”.....	29
Fig. 10 The tone shapes of “normal rising” (NR) T2	30
Fig. 11 The tone shapes of “mid-level” (one of the Level) T2.....	30
Fig. 12 The tone shapes of “low-rising” (LR) T2	31
Fig. 13 The percentage of NR and variation	33
Fig. 14 The percentage of the 3 tonal types (NR,LR, Level)	33

Fig. 15 The distribution of the three tonal types (NR, LR and Level) in vowel [i], [a] and [u].	34
Fig. 16 The occurrence of variation of [i], [a] and [u]	36
Fig. 17 The distribution of LR and Level in different language backgrounds	38
Fig. 18 The distribution of NR and the variation	39
Fig. 19 The distribution of the three tonal types in disyllabic expressions	39
Fig. 20 The distribution of LR and Level in different preceding tones	41
Fig. 21 The percentage and occurrence of NR and the variations in the sentence level	45
Fig. 22 The percentage of the three tonal types: NR, LR and Level in the sentence level	46
Fig. 23 The percentage of NR, LR and Level within each language background	48
Fig. 24 The percentage of NR, LR and Level in each gender	49
Fig. 25 The percentage of each gender in NR, LR and Level	50
Fig. 26 The percentage of the variations of the three regions in isolated words	51
Fig. 27 The percentage of the variations of the three regions in disyllabic expressions	51
Fig. 28 The percentage of the variations of the three regions in sentences	52
Fig. 29 The percentage of LR and Level in isolated words among different regions	52
Fig. 30 The percentage of LR and Level in disyllabic expressions among different regions	53
Fig. 31 The percentage of LR and Level in sentences among different regions	53
Fig. 32 The percentage of the variation in the three regions with regard to genders	54
Fig. 33 the distribution of the normal T2 and the T2 variation in three different syntactic units	55
Fig. 34 The distribution of LR and Level in three different syntactic units	55

Fig. 35 The distribution of the total NR and the variation of males and females57
Fig. 36 The comparison of the percentages of LR and Level in three different syntactic units58
Fig. 37 The falling effect of a low-level final T2.....	62
Fig. 38 The percentages of NR and the variation in total tokens of the three experiments63
Fig. 39 The distribution of LR and Level in total tokens of the three experiments....	63
Fig. 40 The percentage of LR and Level of the total tokens in males and female69
Fig. 41 The distribution of each vowel in each tonal type71
Fig. 42 The percentage of the total occurrence of the T2 variation74