

Chapter 4

Discussion

We have seen in the last chapter the results of T2 variations in different conditions. In this chapter, we will discuss these results from a broader view of languages, societies, and speech acoustics. The issues we are going to discuss are as follows. First of all, section 4.1 discusses the forming of the dominant variant: Level. Section 4.2 discusses the difference between different language backgrounds. Then, section 4.3 generally discusses other factors that influence the T2 variation. Finally, section 4.4 discusses the new trend of T2 among the young speakers in Taiwan.

4.1 The dominant variant: Level tone

In our findings, T2 has two major variants: LR and Level. Between the two types LR and Level, the percentages of Level in the three syntactic units are overall higher than those of LR, and much higher in the sentence level, as shown in Figure 36.

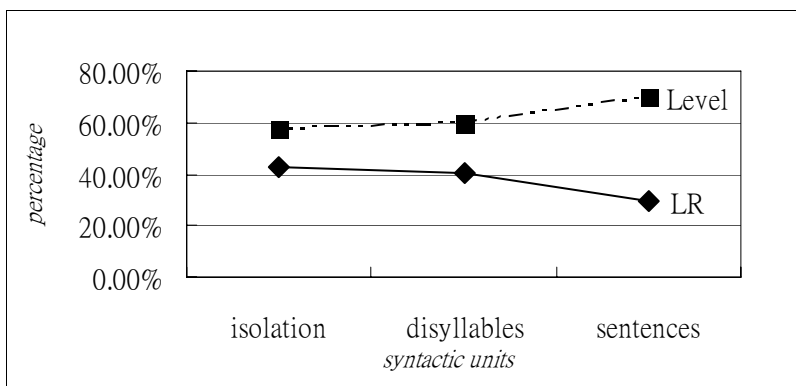


Fig. 36 The comparison of the percentages of LR and Level in three different syntactic Unit

This suggests that Level has become the most dominant variant of TM T2. That is to say, T2 is flattened and somewhat lowered in the tonal contour. This tonal change can be explained from the following points of view.

1. The narrowing of the tonal range

Fon (1997) and Fon & Chiang (1999) have investigated the tonal system of TM and discovered that, TM tones demonstrated a four-way distinction, which is narrower than the five-way distinction proposed by Chao (1968). They found that, by measuring fundamental frequencies, four-scaled system is enough to represent TM's tonal relationship. Compared to Beijing Mandarin (BM), whose tones are spatially even distributed in the five-scaled system, tones in TM are more concentrated in the lower register. The difference of these two tonal ranges can be seen in Table 15, the comparison of prescriptive (BM) and descriptive (TM) tonal systems proposed by Fon & Chiang (1999).

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)

	Prescriptive (BM)				Descriptive (TM)			
	T1	T2	T3	T4	T1	T2	T3	T4
Scale 5	**	*		*				
Scale 4			*		**			*
Scale 3		*				**	*	
Scale 2			*			*	*	*
Scale 1			*	*			*	

As shown in Table 15, the tonal range of TM is indeed lower and narrower than that of BM, in that TM loses the register of the fifth scale. Following this trend, a lowering and narrowing variant for TM T2—Level, is emerging.

But Cheng (1990) proposed another reason for the difference between TM and Beijing Mandarin. He points out that TM was historically greatly influenced by the “Shanghai” or “Zhejiang” Mandarin, but not the Beijing Mandarin from the beginning when Mandarin is practiced in Taiwan²⁸.

2. The ease of articulation

As for the higher percentage of Level in sentences, one possible reason is that T2 tends to be flattened under a higher speed in uttering sentences than single words. In the condition of a faster rate of speaking, the contour tone can hardly be pronounced completely. Tseng (1990) has found that T2 is perceived as a level tone when cutting off 75 % of the vowel from the end. She also found that the fundamental frequency does not begin to rise until the middle of the vowel. This indicates that when a T2 is pronounced shortly, it may be realized as a level tone because it ends itself before it starts to rise.

Besides, the losing of energy is another reason for the Level variant (Tseng, 2004). Tseng has proposed that in fluent speech, the intonation at the utterance-final tends to be declined. In Experiment 3 (sentence level), all T2 occurs in phrase-final or sentence-final position, where the energy of a breath group may easily exhaust. In this condition, the rising part of a T2 may not be pronounced because of the lack of energy.

²⁸ Cheng (1990) mentioned that “the standard Taiwan Mandarin” was greatly influenced by Shanghai and Zhejiang people. However, the validity of Cheng’s view is in dispute as many other Chinese dialects were also brought into contact with TM around 1949 and the early 1950s.

3. Level T2 as a broader category for the “falling” T2

Although the falling pattern of T2 was observed by some researchers (H. J. Hsu, 2004, S. Y. Hsu, 2004 & Lo, 2004), in this study, the obvious falling T2 is found only a very small amount of tokens. This can result from how we measure and define the “falling” pattern. Among the previous studies, H. J. Hsu (2004) found that the height and tonal shape a falling T2 is similar to T3 (31); S. Y. Hsu (2004) found that the falling T2 sounds like a low-falling contour and Lo (2004) also mentioned that the falling T2 sounds somewhat like the third tone. In this case, the “falling” T2 defined by the previous researchers is more like a “low-falling” tone, representing by the value of 31 or 21. In this study, both tonal values were heard and most cases are 21. However, perceptually, 21 does sound like 11, especially when the duration of 1 is longer than the falling portion. In this case, the “falling” was viewed as a natural decline following a higher tone, as shown in Figure 37, a spectrogram with the analysis of pitch contour. In this Figure, the target T2 word “tu2” (“map”) is preceded by a T4 word (di4) which has a mid-ending (53) offset. The pitch of “tu2” firstly goes falling from the mid register and then remains level. We thus suspect those “falling” effect occurs naturally following a higher tone. Moreover, accompanied by the lack of energy in utterance-final positions, the falling contour is even harder to rise. When a subject tries to pronounce a dipping T2, they firstly let the pitch goes down, but at the lowest point the energy is too weak to support the vocal cords to strain again, so the pitch goes flat instead of rising.

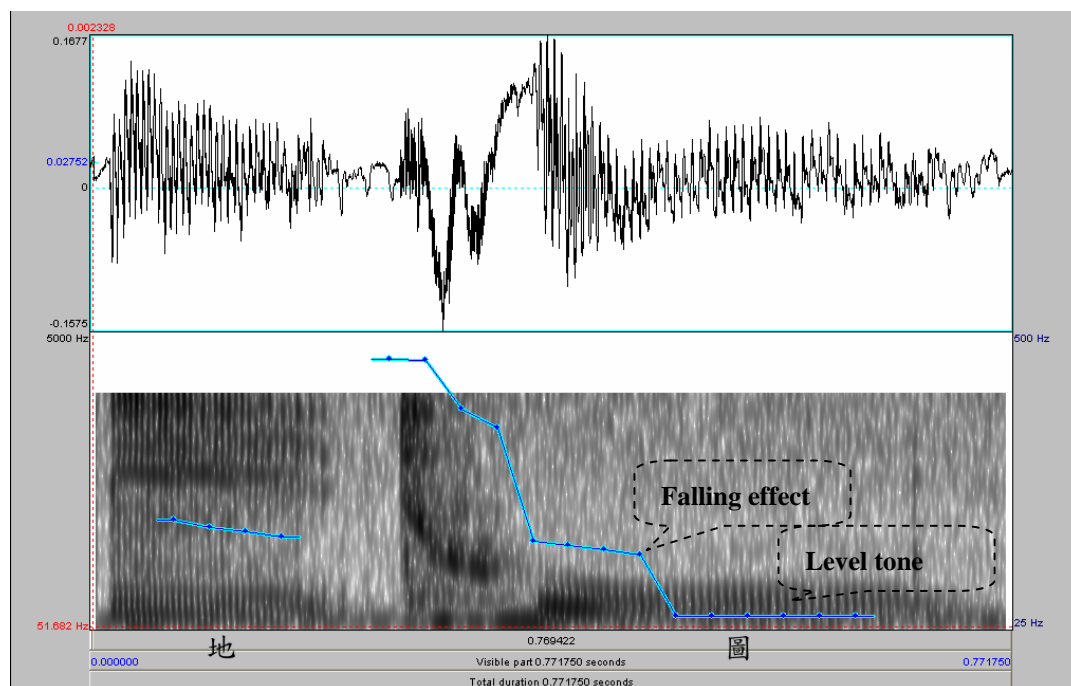


Fig. 37 The falling effect of a low-level final T2

4.2 T2 variations in Tw-TM bilinguals and TM monolinguals

One of the major concerns of this study is to find if the production of T2 is different between monolinguals and bilinguals. The answer is yes. In our findings, the percentages of the variation in the bilingual group are consistently higher than the monolinguals throughout each experiment. In total tokens of the three experiments, the percentage of the variation in the bilingual group (74.9%) is still higher than that in the monolingual group (64.4%) as shown in Figure 38. This confirms our hypothesis of the language background influence.

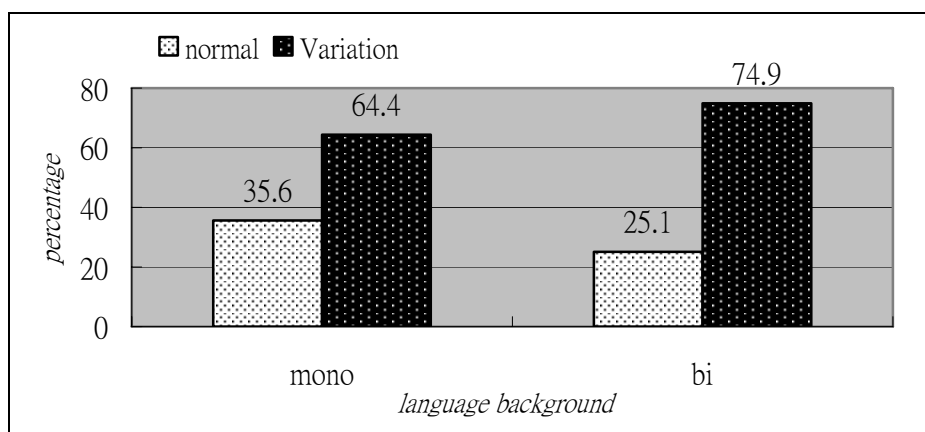


Fig. 38 The percentages of NR and the variation in total tokens of the three experiments

Figure 39 shows the distribution of monolinguals and bilinguals in the two variants. Within the variation, both language backgrounds have almost equal percentage of Level, but the bilinguals show higher percentages of LR than the monolinguals. Since LR is a rising tone with a lower register and without a sharp rising portion, this distribution indicates that there may be more bilinguals producing a lower register of the T2.

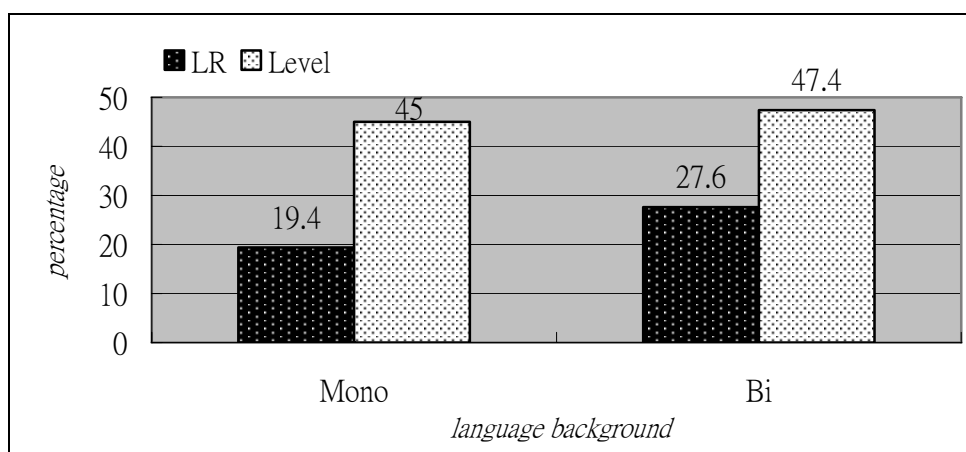


Fig. 39 The distribution of LR and Level in total tokens of the three experiments

Considering the language background, the lowered register of the bilinguals may be influenced by Taiwanese. Kubler (1985) and Tsao (2000) have discussed the influence of Taiwanese on Taiwan Mandarin and compared the tonal system of

Mandarin and Taiwanese. Table 16 shows the tonal system of Mandarin proposed by Chao (1968) and Table 17 presents the tonal systems of Taiwanese which is consulted from Tsao (2000), Chung (2002) and Lu (2003). From the tonal system of Taiwanese (Table 17), we found that there is also one rising tone (Yangping) in Taiwanese, but the tonal value is from low to mid, whose register is very close to our definition of LR. The tonal value of the Mandarin rising tone (Yangping) is around mid to high, which is obviously higher than the Yangping of Taiwanese. The comparison of both Yangpings can be seen in Table 18. Because TM and Tw have only one rising tone respectively, replacing one from the other is still intelligible. In this regard, when a Tw-TM bilingual is more proficient in speaking Taiwanese than Mandarin, he tends to pronounce the Taiwanese Yangping (13/ 24) instead of the Mandarin Yang-ping (35). This point of view corresponds to our results that the bilinguals have higher tendency replacing normal T2 with the LR.

Table 16 The tonal system of the standard Mandarin (Chao, 1968)

Chinese name	Graph	pitch
Yinping	┘	55
Yangping	┘	35
Shangsheng	↗	214 or 21
Qusheng	↘	51

Table 17 The tonal system of Taiwanese (Tsao,2000, Chung,2002 and Lu, 2003)

Chinese name	Graph	pitch
Yinping	┌	55
shangsheng	↘	53
Yinqu	∨	31
Yinru	┐	32/ 31
Yangping	↗	24/ 13
Yanqu	┐	22/ 33
Yangru	┌	55

Table 18 The comparison between TM Yang-ping and Tw Yang-ping

	TM	Tw
Tone class	Yangping	Yangping
Graph	┌	┌
Pitch	35	13/ 24

On the other hand, in Figure 39, within Level, the percentages of the bilinguals and the monolinguals are quite near and are almost equally distributed. This indicates that under the change of narrowed tonal range, the leveling of the T2 may be an universal phenomenon, regardless of different language backgrounds for the young speakers²⁹ of Taiwan. In a sense, the rising T2 may be neutralized into a level T2 with a flat contour by the young speakers in Taiwan.

Moreover, the percentages of Level in both language backgrounds are much higher than LR. This suggests that Level is a more dominant tonal variation in both language backgrounds. In other words, there is no difference between monolinguals

²⁹ In the study, the subjects were aged from 17-27.

and bilinguals in the type of Level. This further indicates that LR is the unique tonal type that differentiates the monolinguals and bilinguals. In another word, the difference we heard from different language backgrounds is the LR variant.

The above results are different from the previous studies in the following aspects:

1. The most salient T2 variation that differentiates the bilinguals from the monolinguals is LR, instead of a falling tone proposed by H. J. Hsu (2004), S. Y. Hsu (2004) and Lo (2004).
2. Level was found the most common T2 variation regardless of the language backgrounds.

Although we have found the different distribution of the variations in the two language backgrounds, there are things we have not dealt with. As mentioned in chapter 3, the type Level includes two different registers: mid (about the tonal values 3 or 4) and low (about the tonal values 1 or 2). These two sub-types can be distinguished by the human ear most of the time. But in the condition of a narrower tonal range, the distinction between the two sub-types is hardly separated. In our experiments, we found that many subjects' tonal ranges are very narrow. In the lack of an actual measurement of the F0 value as well as the tonal range, we hence decide not to separate the mid-level tone from the low-level tone and merge the two into a broader category—the level tone. In this case, both heights of the register may be

covered by the broader categorization. We thus lack the evidence to prove if the bilinguals' register is overwhelmingly lower than that of the monolinguals in producing the Level T2. We leave this to be discussed in future studies.

4.3 The other factors that affect T2 variations

Besides the language backgrounds, we also found other factors that may influence the T2 variation. They are sorted into two sections in 4.3.1 the social factors and 4.3.2 the linguistic factors. Each will give explicit explanation of the results.

4.3.1 The social factors: genders, regions

Two social factors are discussed in this section: genders and regions. Genders are found to affect the T2 variation but regions may have limited influence on the T2 variation. Each factor will be discussed in the following sub-sections: 4.3.1.1 and 4.3.1.2.

4.3.1.1 The effect of Genders

Gender differences in language have been proposed by many researchers (Zhan, 1984 in Tse, 1992; Fromkin, Rodman & Hyams, 2002). The common description of the differences between two genders is that females are more standard conscious and use the language more properly, i.e. closer to the norm. Zhan (1984) has found that among Mandarin speakers, females perform the normal [z] more often than males. Tse (1998) also found that among the young speakers in Taiwan, females preserve more salient retroflex feature in pronouncing Mandarin retroflex consonants [tʂ], [tʂʰ]

and [s]. Some researchers (Fromkin et al., 2002) state the fact that females speak with a higher pitch than males is affected not only by physiology alone, but also by some social factors involved during the acquisition period. On the whole, all the differences between males and females may result from physical differences, social standards, and cultural educations.

In our findings concerning gender difference and T2 variation (see Figure 35 in section 3.5), although in both genders, there is no significant difference between the occurrences of variations, we can still find the tendency that females perform less variations than males. The tendency acknowledges the fact that females are more standard conscious in the previous findings on gender differences.

Figure 40 shows the percentages of LR and Level of the total tokens in different genders. Within the variation itself, both genders present a similar distribution of LR and Level: the percentage of Level is higher than that of LR. This result confirms the overall tendency that Level occurs more often than LR. But comparing the occurrence of each variant from each gender, we can still find a significant difference between males and females. We found that males produce more Levels than females, while females perform more LRs than males. The distribution can also be seen from Figure 40. This indicates that, comparing with females, more males perform level T2s. In other words, males may speak with a flatter monotone. This is not surprising because in the society, males are taught to be steadier and calmer and less emotional. This way of education may turn out a speech style with a flat tone. On the other hand, females

are less restricted in showing their emotions most of the time. This fact reflects a more active style in the language and turns out to be a style with more pitch contours. Hence the females would perform more LR (a contour type) than males.

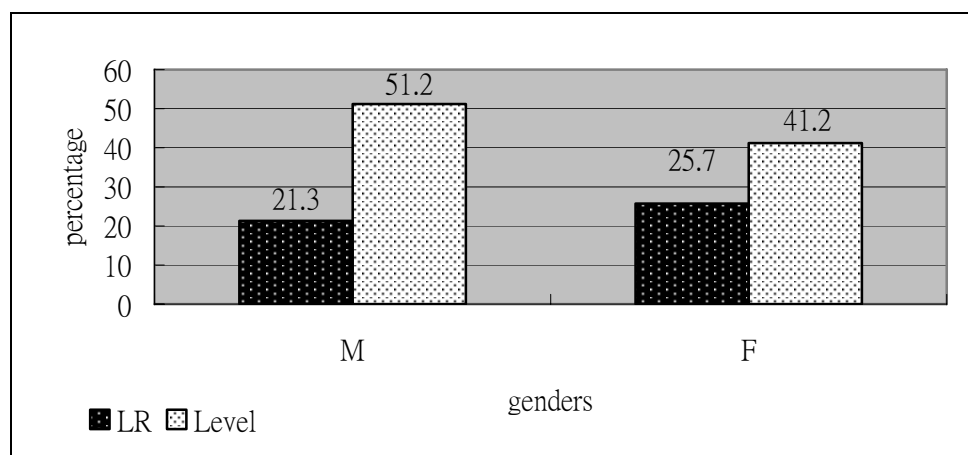


Fig. 40 The percentage of LR and Level of the total tokens of the 3 experiments in males and females

4.3.1.2 The limited effect of the regions

The influence of regions is found to be restricted. Although we didn't find significant difference on the occurrence of variations among the three regions: the northern, the central and the southern, the results show a tendency of higher occurrence of the variation in the southern and the central speakers than in the northern. This tendency may relate to our hypothesis on language backgrounds, in that the southern part of Taiwan is thought to have more Taiwanese environment than the central and the northern, and the central has more than the northern. The tendency may somewhat relate to the language structure in Taiwan. It is possible that in these two areas, it is the sufficient Taiwanese input that contributes to more T2 variations. The more proficient of the Taiwanese, the more variations there will be.

Besides, within the variations, the region is found to have difference only in

sentence level (see Figure 31 in section 3.4), which shows a limited effect of region on the T2 variation. In sentence level, all regions show higher percentages of Level variant, which also reveals that the bilinguals prefer the type of Level rather than LR. But there are differences among the three regions. First of all, the occurrence of Level in the southern group is significantly higher than the central and the northern, and the central is significantly higher than the northern. This shows that the central and southern subjects produce a more flat T2 than the northern subjects. This may be because the southern and central bilinguals' tonal range is narrower and their contours appear to be flatter. But why and how the tonal range has the regional difference needs more future studies to confirm.

Within LR, the northern has the highest percentage, the central the second and the southern the lowest. Compared to H. J. Hsu's study (2004), who found that Taichung (the "central" group in this study) speakers tend to pronounce a falling T2 while Taipei (the "northern" group in this study) speakers do not, this study do find that the northern speakers perform more contour tones (NR and LR), but do not find the contrast of falling and non-falling tones between the two regions. However, these different results may be due to the different methods adopted in the study and H. J. Hsu's. H. J. Hsu (2004) measures the fundamental frequency of the T2, while this study distinguishes T2 mainly by auditory categorization. The perception and the results of the machine reading are sometimes discrepant.

4.3.2 The linguistics factors: the vowels, the preceding tones and the sentence positions

Three linguistic factors are discussed in this section: the vowels, the preceding tones and the sentence positions. Those factors are found to have somewhat influence on the T2 variation. Each factor will be discussed in the following sub-sections: 4.3.2.1, 4.3.2.2 and 4.3.2.3.

4.3.2.1 Vowels

In this study, the three extreme vowels in the oral space [i], [a], [u] are investigated. Figure 41 shows the distribution of each vowel in each tonal type.

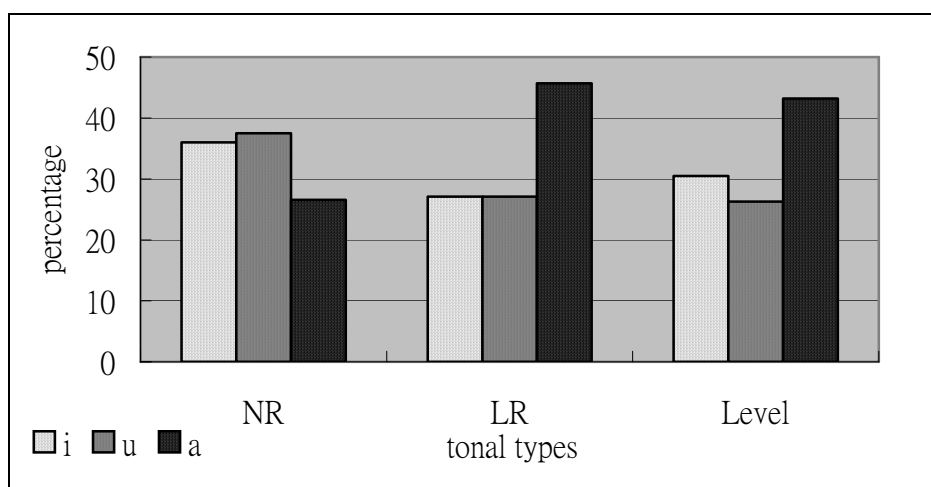


Fig. 41 The distribution of each vowel in each tonal type

Among the three vowels [i], [u], [a], the high vowel [i] and [u] are more with them the normal T2s, whose register is averagely higher than its variation. This confirms Ho's (1976) finding that high vowels have higher fundamental frequencies, so their pitch contours appear to be higher. On the contrary, the low vowel [a] has more T2 variations: LR and Level, whose register is relatively lower than the NR type.

The result also confirm the fact that [a]'s lower fundamental frequency has affected the T2 variations. The results confirm to what Ho (1976) has found. Ho has conducted an acoustic experiment examining the relation between the syllable vowels³⁰ and the tonal variations in Beijing Mandarin and found that the low vowel [a] usually has the lowest fundamental frequency, while high vowels usually have the highest. Because vowels are the tone-bearing unit, the F0s of the vowels do affect the pitch contour.

4.3.2.2 The preceding tones

In our findings, the different preceding tones do affect the occurrence of the T2 variation. The preceding tone with a high-ending offset (say, T1 [55] and T2 [35]) influences more target T2s becoming a variation, while that with a low-ending offset (T3 [21] and T4 [53] or [51]) does not. This is very surprising to us. Because the T2 variations found in this study are all within one's mid to low register. It is supposed that the low-ending offset will affect more normal T2s to start from a low point of pitch and make them a tone with a lower register (low-rising, mid-level or low-level). But interestingly, the assimilatory effect is not salient from our findings. The assimilatory effect means the starting F0 of a tone is assimilated to the offset value of its previous tone. The preceding tone usually affects the target tone in a carry-over, i.e. assimilatory way (Xu, 1997), a phenomenon in agreement with the findings of many previous researches (Han & Kim, 1974; Shen, 1990; Gandur, Potisuk & Dechongkit, 1994; Xu, 1994 & 1997; Potisuk, Gandour & Harper, 1997). However, in our study,

³⁰ She examined seven Mandarin vowels, the high vowels [i], [y] and [u], the mid vowels [e], [ɤ] and [o] and the low vowel [a] in a CV structure.

the tonal effect is not assimilatory, rather, it turns out to be more like a dissimilatory effect, i.e. a tone with a high offset will lower the onset of the following tone. The reason for such phenomenon is unknown and need further acoustic measurements to decode it.

4.3.2.3 Sentence positions

In our Experiment 3, two sentence positions were examined: sentence-medial and sentence-final. We found that the total occurrences of the T2 variation are not affected, namely, no particular position influences more T2 variations. But within the variation, the distribution of LR and Level is different in the two positions. More Levels in S-medial than in S-final and more LRs in S-final than in S-medial. This suggests that T2 tends to be leveled in sentence-medial positions. The lack of contour in the sentence-medial may due to the unstressed weakening, i.e. the neutralization, proposed by Chao (1948) (cited in Cheng, 1973). On the other hand, in sentence-final positions, the final terms (disyllabic expressions) tend to get a focus and be lengthened compared with the sentence-medial positions. For example, in the sentence “Zhe4 jiu4 shi4 wen4-ti2” (This is the question), the disyllabic expression “wen4-ti2” being placed in the final position of an introductory carrier sentence “Zhe4 jiu4 shi4___,” it is easy to put the focus or stress on the final expression. In this way, the final T2 will possibly be given more time to pronounce. This will provide more chance for the contour LR but less chance for the level tone, which shows the situation that the focus overrides the final decline. The duration of the target T2 could

be another crucial clue for tonal variations. More future studies on the durations will be expected.

4.4 The T2 variation as a trend in TM

Within the 24 subjects and a total of 2736 tokens of T2, there are over 50 % occurrences of the T2 variation found in the three experiments (as shown in Figure 42). This suggests that the T2 variation averagely occurs more often than the normal T2. An emerging T2 variation among the young speakers in Taiwan Mandarin is found.

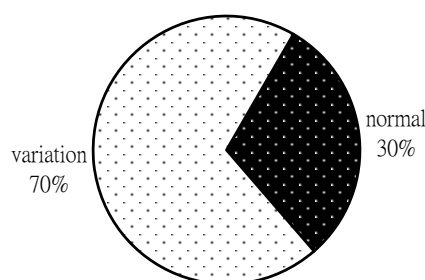


Fig. 42 The percentage of the total occurrence of the T2 variation

Apparently, TM T2 of the young speakers is changing through the time: from the standard high-rising contour ([35]) (Chao, 1968) to a dipping contour ([324]) (Fon, 1997³¹; Fon & Chiang, 1999; Fon & H. J. Hsu, 2004) and toward a lowered and leveled low-rising (LR) contour and level tone (Level). The changing may result from many factors as we discussed above. However, the fact that the tonal production of

³¹ In Fon (1997)'s study, the subject is 24 years old.

TM is more different than the so called “standard Mandarin” (which can be represented by Beijing Mandarin) is undoubted. One possible social and historical factor that cannot be ignored is the language contact. Cheng (1990) has mentioned that language will change by interacting with the environment. For example, Taiwan originally has three accents of Southern Min: Zhangzhou, Quanzhou and Chaozhou accents. These three accents differentiate very much with one another in Mainland China. However, as time goes by, these three accents lost their distinctions and have merged into the new dialect: Taiwanese. In Taiwan nowadays, one can hardly tell where one’s ancestors came from by his Taiwanese accent (Cheng, 1990). Tsao (2000) also pointed out some examples from the language contact in Taiwan. He emphasizes the natural process for language change in a bilingual society such as Taiwan. He also found that from the comparison of L1 and L2, many language varieties can be explained. Some language varieties arouse from the interference of L1. The reasons for the tonal change may be multiple and cannot be discovered in one time. But the developing T2 variation as a trend in Taiwan is worthy observing in the future.