EXPLORING BOUNDARY TONES IN TAIWAN SOUTHERN MIN

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ABSTRACT

This study explores boundary pitch movements in Taiwan Southern Min (TSM) by investigating pitch variations of final particles. Based on annotation research on the pitch targets of final particles in a 117-minute spontaneous speech corpus, it is proposed that instead of viewing such pitch variations as lexical tones, these variations should be referred to as three types boundary pitch movements, namely, the L% tone, the % tone, and the relatively infrequent H% tone. A Preliminary analysis on the proposed tones reveals that pitch-target labeling on final particles is able to capture differences in pragmatic-discourse meanings. The findings may serve as a starting point to further development of prosodic description of TSM.

Keywords: final particle, boundary tone, ToBI, Taiwan Southern Min

1. INTRODUCTION

The major goal of this study is to provide an exploratory description on the inventory and the distribution of boundary tones in Taiwan Southern Min (TSM) by investigating final particles, which are best targets for observing post-lexical pitch movements in tone languages.

Boundary tones are originally defined as single tones (high or low) associated with the edges of an intonational phrase in Pierrehumbert's [6] analysis on English intonation. In her analysis, a boundary H% tone always indicates a final rise, while the L% tone indicates no final rise. For example, after an L- phrase tone, an L% tone indicates a fall, yet after an H- phrase tone, L% simply indicates a sustained pitch level. Such a dichotomy of H% and L% tones is adopted, with various degrees of modifications, in other prosodic labeling systems such as the Pan-Mandarin ToBI system [5] and the Cantonese ToBI system [8], the latter of which expands the inventory of boundary tones by proposing additional labels such as H:%, HL%, and % in order to describe variations of boundary pitch movements in Cantonese.

Although a ToBI system for TSM has been proposed by Peng and Beckman [4], labeling and analysis on boundary pitch movements have only been briefly mentioned by stating that pragmatic particles may actually be recipients of boundary tones of a larger prosodic unit such as the intonational phrase. This implies a departure from how the tonal behavior of such particles has been treated in the works of traditional lexicographers such as [7], which refer to the pitch movements on these particles as lexical tones and posit lists of lexical entries whose subtle differences in meaning are distinguished only by tonal differences that exhaust almost all the tonal contrasts possible in TSM's repertoire of lexical tones (seven in total, two of them are checked tones, i.e., the syllables end with a stop coda).

A Similar departure from a strictly lexical view of pitch movements on final particles can also be found in Li's [3] discourse-pragmatic study on final particles in conversational data in TSM, which provides a unified account on the categorization of final particles according to their "tones". In her analyses, final particles are assigned lexical tones, yet the assigned tones are categorized into high and low variants. The high variants include high-level, low-level, and low rising tones, which are associated with a higher degree of speaker involvement and an indication of the addressee's orientation as projected by the speaker. The low variants contain high-falling and mid-falling tones, which signal a lower degree of speaker involvement and an emphasis on the speaker's own orientation. These two variants can be realized on different types of final particles, adding the associated pragmatic-discourse meaning to the "core" meaning of individual types of particles.

A closer look at Li's [3] analysis reveals that her dichotomy is actually based on the pitch targets of the particles, rather than a simple high-low tonal categorization. The low variants contain tones with a low target, while the high variants are tones with a non-low target. In other words, her work implicitly suggests a possibility of treating the

tonal variations on final particles in TSM as boundary tones.

The present study aims to examine such boundary pitch movements on final particles with a corpus study on spontaneous speech that investigates the types of boundary pitch movements available, as well as their associated pragmatic-discourse meanings.

2. METHODS

A total of 117 minutes of recording, containing monologues in TSM recorded by four subjects were labeled for subsequent analyses. All of the subjects are females from Taichung. Two of the subjects were in their mid-20s, while the other two were in their late 50s. Each subject contributed around 30 minutes of recording. The monologues were in the form of interviews, in which the interviewer asked the interviewee to talk about topics such as health, travel experience, family, schoolwork, etc. As a result, a large proportion of the contents are narratives on personal experiences. The recordings were transcribed and annotated with the Praat software [1]. The transcription on orthography adopted Pinyin romanization with numbers referring to tonal categories.

The final particles labeled were *ah*, *oh*, *lah*, *leh*, *neh*, *honn*, and *ma*. The tonal targets of these final particles were labeled into three types: H%, %, and L%. The tonal target of the syllable preceding the final particle serves as the reference point. The H% tone refers to a rise which makes the pitch target higher than the preceding target. The L% tone refers to a pitch movement which makes the pitch target lower than the preceding target. The % tone refers to a plateau after the preceding tonal target. For example, if the tonal target of a particle is perceived to be lower than the preceding lexical item, the particle is labeled as having an L% target. Figure 1 contains stylized presentation of these three targets. It should be noted that the judgment was based on the subjective perception of the first author, a TSM native speaker, on the final pitch target; pitch tracking was only for reference. It should also be noted that at this stage, the labeling of boundary tones do not definitely imply an analysis involving phonological categories.

In order to see whether these boundary movements are autonomous choices that can occur freely in any contexts, a Chi-square test were employed on overall distribution of boundary tones after two different types of tonal targets. The H%

tokens were excluded from the Chi-square analysis because of its relatively scarce frequency and skewed distribution in the corpus. The result of the Chi-square test did not show a significant effect of mutual dependence between preceding tonal targets and the boundary tones [$\chi^2(1, N = 588) = 0.13$, n.s.]. The contingency table is presented in Table 1, and the distribution of boundary tones for each subject is presented in Table 2.

Figure 1: Schematized presentation of boundary pitch movements. The final targets of different tone shapes serve as the reference point for labeling boundary targets.
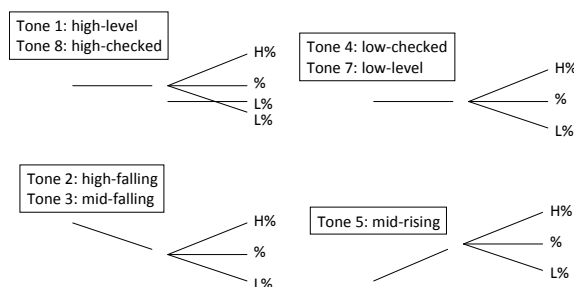

Table 1: The contingency table for the examination of mutual dependency on boundary tones and preceding targets. Only the parts in bold were examined by a Chi-square test.

		preceding tonal target		
		H	L	total
boundary tone	H%	1	19	20
	%	**38**	**84**	**122**
	L%	**153**	**313**	**466**
	total	**191** (192)	**397** (416)	**588** (608)

Table 2: Distribution of boundary tones for four subjects.

LYY			HRT		
	H	L		H	L
H%	0	2	H%	1	17
%	6	12	%	5	33
L%	33	64	L%	32	99
CXH			LXQ		
	H	L		H	L
%	12	24	%	15	15
L%	7	34	L%	81	116

3. BOUNDARY TONES

3.1. The L% tone

The L% boundary tone is the most frequent one in the corpus (77%), and was found in all possible contexts, with all particles. An L% tone is characterized with a low pitch target following the tonal target of the preceding target. The L% tone in the example in Figure 2 could be referred to as the

"default narration" tone, while the example in Figure 3 demonstrates the usage of L% tone as a marker indicating that the speaker has received the new information from the interviewer, who was asking for her comments on Mainlanders.

In Li's [3] study, she states that the Low group of particles is associated with the speakers' own orientation. The corpus investigated in this study contains narratives on personal experience unfolded from the speaker's stance, so the dominant occurrence of the L% tone is expected.

Figure 2: An example of a final particle carrying an L% tone. /ah kah4 i1 cho3-hoe2 chhiah4-phong3-se ah/ 'and knitting with her together'
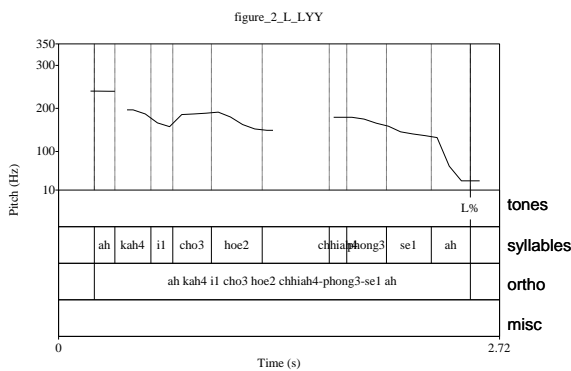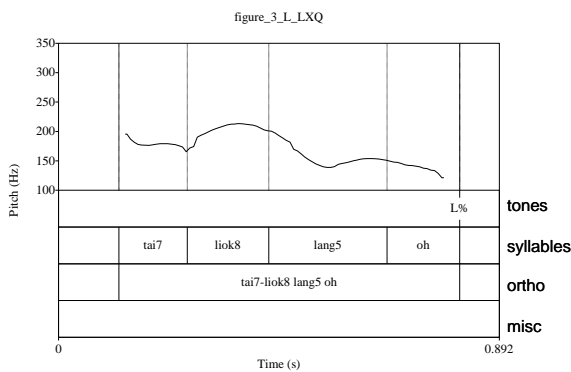

Figure 3: An example of a final particle carrying an L% tone, signaling the reception of a piece of new information. /tai7-liok8-lang5 oh/ 'mainlanders'

3.2. The % tone

The % boundary tone labels situations where there is no additional pitch target after the preceding syllable's tonal target. In other words, there is a plateau with a perceived pitch height similar to the last tonal target before the final particle. About one-fifth of the final particles in the present corpus bear this % boundary tone.

Although the % boundary tone indicates no additional targets and may even be referred to as the result of phonological rules such as tonal spreading, it does not mean that the pragmatic-

discourse meaning that this % tone conveys is just "default." In contrast, for the labeler, perceptually the sustained pitch level is very marked, which often conveys a stronger emphasis from the speaker, as the example in Figure 4 demonstrates. In addition, the % tone can also be considered as having a similar function as the "continuation L-H%" in English, as demonstrated by the example in Figure 5.

Figure 4: An example of a final particle carrying a % tone, signaling stronger emphasis. /to chiok4 khah4 chu7-iu5 ah/ 'and it is very... more free.'
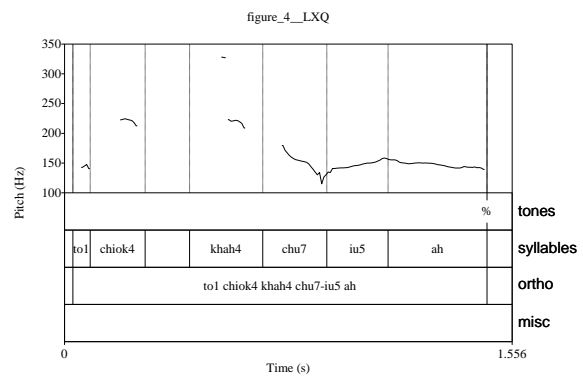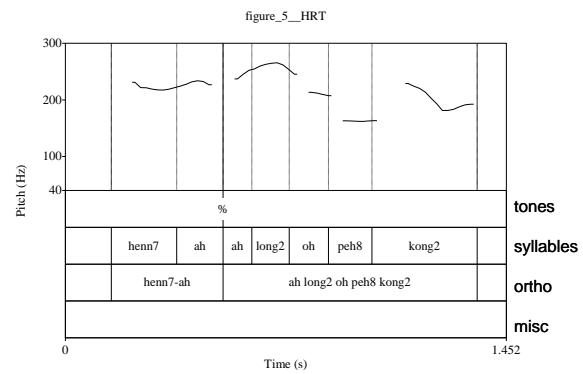

Figure 5: An example of a final particle carrying a % tone, signal continuation. /henn7-ah ah long2-oh peh8 kong2/ 'yeah and always speaking in nonsense'.

It is worth noting that Li's [3] inclusion of two level tones in her "high" category of pitch variation, along with her description that high pitch is associated higher speaker involvement and the orientation of the listener, also suggests a marked connotation of the sustained boundary pitch pattern. Considering only the L% and % boundary tones, it appears that the most important distinction in boundary pitch movements in TSM is "falling" and "non-falling", rather than the "rising versus non-rising" distinction in English. More investigation on such differences cross-linguistically may be able to provide an interesting perspective on prosodic typology.

3.3. The H% tone

Only a small number of H% tokens were found in the dataset. The strong and distinctive percept in terms of pitch movement makes them legitimate for receiving a different label. A large portion of the tokens were produced by one of the young female speaker. Furthermore, the majority of her use of H% adds a "cute" connotation to the expression, as shown in Figure 6. Since this type of usage is only found in the speech of one of the young speakers, it is possible that this usage has an idiosyncratic nature. Yet, if such usage is found in the speech of more young female speakers, this H% tone may be referred to as having an indexical meaning, which still makes a legitimate cause for prosodic labeling, as proposed by Jun [2].

Figure 6: An example of a final particle carrying an H% "cute" tone. /chin1 chin1 phai2-se3 neh/ 'it's so sorry.'
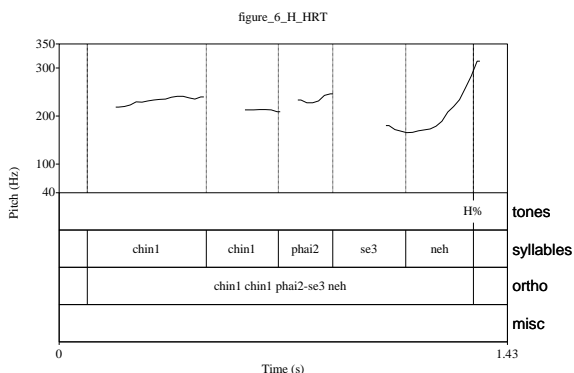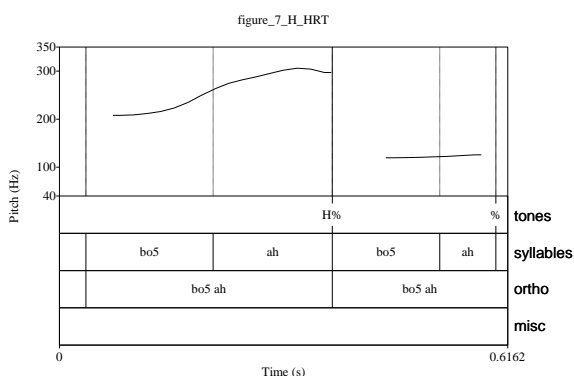

Figure 7: An example of a final particle carrying an H% tone, expressing stronger emphasis, followed by a % tone. /bo5 ah bo5 ah/ 'No, no.'

A small number of H% tone tokens in the corpus function like an upgraded % tone. That is, the final high target adds a higher degree of emphasis in the narration, as shown in Figure 7. Further investigation is needed to answer the question on to what extent such usage gives a distinctive percept in terms of pragmatic-discourse meaning.

4. CONCLUSION

The present study proposes that a pitch-target analysis on final particles in TSM is able to capture the difference in pragmatic-discourse meaning, providing further support, as well as a modified interpretation, to Li's [3] dichotomy of high and low pitch variants on final particles. Three boundary tones are proposed, namely L%, %, and H%. If the proposed boundary tones can be proved to be legitimate indicators of pragmatic or discourse meanings, then we may conclude that final particles in TSM do not really have lexical tones. Instead, the pitch variations that cover almost all the possible lexical tones are best analyzed as boundary pitch movements of larger prosodic units, as proposed in the original TW-ToBI framework [4]. Further steps on this direction may involve intra-labeler examinations on the consistency of the pitch-percept of pitch targets that defines the boundary tone types, as well as a more detailed analysis on the pragmatic-discourse meanings proposed in relevant literature and this present study.

5. REFERENCES

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