INTONATION PATTERNS OF EXCLAMATIONS OF CHINESE EFL LEARNERS FROM ZHENJIANG

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ABSTRACT

The present study investigates Chinese EFL (English as a foreign language) learners' intonation pattern on the expression of exclamations. According to the present study, both of Chinese EFL learners and English RP speakers (Received Pronunciation) adopt a falling (H*L) tone of a sentence to realize the exclamatory intonation. However before the last H*L in an intonational phrase, it can be exists a rising tone and the pitch contour also observes enlargement. The final boundary tone of Chinese EFL learners mostly realize as low (L%) as well as English RP speakers, whereas the initial boundary tone of Chinese EFL learners are mostly high(H%). Further, Chinese EFL learners' pitch range of exclamations is more widely than that of English RP speakers, and Chinese EFL learners are intending to use more pauses in a sentence.

Index Terms—Chinese EFL, intonation pattern, pitch range

1. INTRODUCTION

With the rapid development of the speech technology and L2 acquisition in China, the research of intonation achieved considerable progress. However, there are still many aspects about intonation that need to be explored due to the complexity of intonation itself and the specificity of Chinese as the tone language. Among these researches, the prosody of English functional intonation acquired by Chinese EFL learners becomes a research hotspot in the related field. These researches involved four main kinds of functional intonations, i.e., declarative intonation, question intonation decretory intonation and exclamatory exclamations. Among the four kinds of intonation, the research about intonation of exclamations is scarcely to be covered. The following paragraph reviews the study of English intonation, through which to propose the specific research goal in present study.

In previous research on English intonation, Pierrehumbert specified three types of tonal events for the tonal inventory of English intonation[1], namely, seven pitch accents (H*, L*, H*+L–, H–+L*, L*+H–, L–+H*, H*+H–), two phrase accents (H–, L–) and two boundary tones (H%, L %). Ladd proposed an improved grammar which can be used to generate all the legal tunes of English [2].Based on AM theory, Ladd[2] (as illustrated in Figure 1) specifies the phonologicial representation of intonation contour of English. Specifically, as for declarative intonation, it contains one nuclear tone and one more pitch accents and ends in sequence of phrase accents and L% boundary tone, i.e. (H*) H* L-L%. In regard with the contour of Yes-no questions, it consists of one or more L* accents followed by H- phrase accent and H% boundary. Following figure1 is the tonal eventory of Ladd[2].

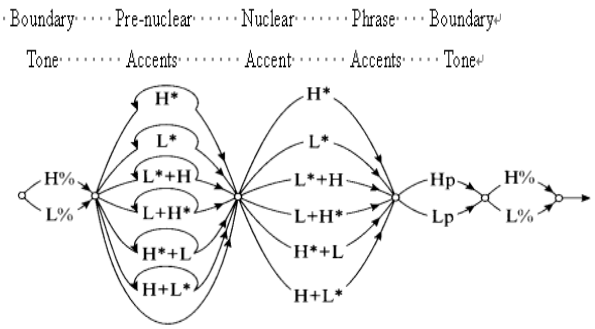

Figure 1 The finite-state grammar of English intonation phrase in Ladd[2]

Recently, phonetic studies have focused on EFL learners' intonation patterns, such as yes-no questions, e.g., Shack [4] found that the Chinese speaker adopted the same general intonation patterns for statements, 'or not' questions as well as for the 'did' and unmarked questions. And, Chen [5] adopted Halliday's theory to analyze the intonation pattern distinction between American speakers and Chinese EFL learners in respect of tonicity, tonality and tone. Ji[6] studies the F_0 contours of yes-no questions with various nuclear accent patterns and boundary tones.

Researches about the phonetic features of Chinese exclamatory intonation are also involved in the phonetic study. Shen [7] proposed that the functional intonation of Chinese is influenced by the entire movement of the high-pitch contour and the low-pitch contour, in which the exclamatory intonation shows that the high-pitch contour slowly slide down and the extension of the low-pitch contour. Wang [8] took the exclamatory intonation into consideration, the study pointed out that they are mostly

tortuous or demotion. The feature of the exclamatory intonation is realized from the function of exclamatory word, and on the other hand it always has the strong intensity. Chen [9] found that the Chinese exclamatory intonation's main prosody features are the strong accent and the wide pitch range in contrast with the declarative intonation.

From the overview of the previous study, it can be obtained that the exclamatory intonation produced by Chinese EFL learners, even in dialect region, has not been commonly discussed. The present paper, in this regard, intends to examine the F_0 contours of exclamatory intonation produced by the learners from Zhenjiang dialect. Comparisons will also be conducted between Chinese EFL learners and English RP speakers, through which to find out Chinese EFL learner's exclamatory intonation patterns, Therefore, their relationship with Chinese intonation patterns and negative transfer of L1 can be further explored..

2. METHOD

2.1 Experimental Data

The speech materials adopted for this paper consist of seven exclamatory sentences, which were selected from a famous English novel, i.e., the Cinderella. Each sentence composed of four to six words, all of which carry strong exclamatory mark. Considering the mood showed by these sentences, some are neutral just to express surprise, some are negative and others are positive mood.

Table 1 List of materials

004: They dreamed of wedding bells!
007: It was her fairy godmother!
008: Lily and Rosa have it all!
012: I don't have a gown!
016: She is much too busy!
017: And her face was dirty!
019: They couldn't believe it!

The recording materials were selected from AESOP-Zhenjiang, the on constructing database by both the Institute of Linguistics, Chinese Academy of Social Sciences and the Phonetics Lab of Jiangsu University of Science and Technology. All the participants are from the Jiangsu University of Science，they are all college students and were born and brown up in Zhenjiang. This study chooses five male and five female from this project who exhibit relatively high English level. The English RP speakers are composed by five male and six female, coming from Landon district. All the audio materials are downloaded from http://www.phon.ox.ac.uk/IViE[10].

2.2 Annotation

The speech data were phonetically and phonologically annotated is based on the combined labeling system of both IViE and ToBI[11]. The annotation tiers include:

1) Orthographic Tier: label all the correct words of the speaker, that is the word tier and the phoneme tier;
2) Break Indices Tier: consist of three levels,1,3 and 4, '1' stand for the word boundary, '3' stand for the ID(implementation domain) boundary, and '4' stand for intonation phrase boundary;
3) Prominence Tier: label the prominent phoneme by 'P';
4) Target Tier: also phonetics tier, describe the changes of intonation through phonetics, correspond to the '3' boundary of break indices tier;
5) Phonologic Tier: describe the intonation pattern by linguistic description

2.3 Data extraction

The 'wav' files were first labeled the boundaries by auto-segmentation software. The F_0 for each target sentence was modified manually, and extracted by Praat script. Then, the value of pitch is transferred from Hz to semitone values with the formula of $(12*\log(F_0/100,2)$, 100 Hz is selected as the reference pitch value). The F_0 data was extracted from vowels in each word with one vowel being selected ten points.

3.1 The comparative features of pitch level and pitch range of Chinese EFL and English RP Speaker

Based on the data extracted, the maximum and the minimum pitch point from ten points of one single syllable are picked out. Then the pitch range is calculated by maximum value minus minimum value. Regarding the gender difference of fundamental pitch, the value is calculated separately between male and female. Finally, we've got values the maximum and minimum values as shown in Table 2. The larger one of the same item between Chinese EFL and English RP speaker, it is written as bold and italic characters The Chinese EFLs' value is higher than that of English RP speakers on maximum value, minimum value and pitch range, as shown in Figure 2, no matter he/she is male or female. It indicates that Chinese EFL adopt strong exclamatory features while English RP are not so obvious. We conclude that it may be influenced by negative transfer of L1. The same result shows that Chinese EFL mainly realize it's intonational accent through enlarging its pitch value. On the other hand, this shows that the low rising tone usually does not carry the intonation accent, for the reason that Chinese EFL seldom realize nuclear accent by low rising tone(L*H).

3.2 Comparison of pitch patterns between Chinese EFL and English RP

Table 2 The maximum value minimum value and the pitch range of seven sentences

Sen No.		Female Max	Female Min	Female Pitch Range	Male Max	Male Min	Male Pitch Range
004	CH	***252***	***181***	71	***161***	107	***54***
	RP	247	156	90	154	111	**43**
007	CH	***266***	163	***103***	***162***	***105***	***56***
	RP	254	***174***	80	131	98	32
008	CH	***291***	176	***115***	***175***	***116***	***60***
	RP	263	***180***	83	137	94	43
012	CH	263	***193***	71	***172***	***108***	***63***
	RP	***264***	167	***97***	137	102	36
016	CH	278	140	***137***	***183***	***108***	***75***
	RP	***281***	***161***	120	139	101	38
017	CH	***250***	***168***	82	***170***	***112***	***58***
	RP	241	152	***88***	134	104	30
019	CH	***284***	141	***143***	***197***	***109***	***88***
	RP	273	***178***	95	158	106	52

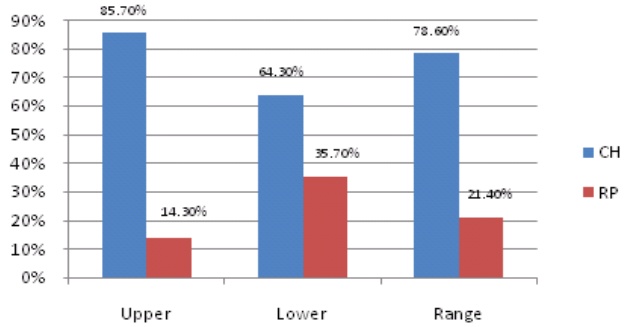

Figure 2 The percentage of all the three value type between Chinese EFL and English RP

Figures 3-9 display the mean time-normalized F_0 contours when the nuclear accent falls on the final word of the sentences. Vertical lines indicate phoneme boundaries. In the figure, "RP" stands for English RP speakers and "CH" for Chinese EFL learners.

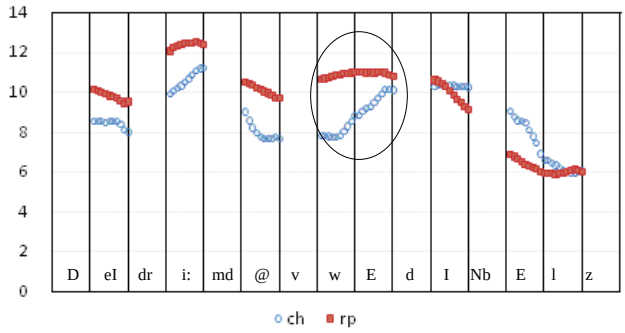

Figure3 Time-normalized F_0 contours of Sen. 004: They dreamed of wedding

Figure 3 shows the intonation pattern of Sentence 004. In the sentence, Chinese EFL's prominent syllables distributed on dreamed, wedding and bells, respectively. The English RP Speaker located on dreamed and wedding. From the representation of phonetics, in the level of ID, Chinese EFL adopts mH-l and lLH-h while English RP adopt mH-l and lH-l. Secondly, referring to the representation of phonological feature, both Chinese EFL and English RP apply the H*L pattern or the H*+H*L pattern. And, Chinese EFL apply H% boundary at the beginning of each intonation phrase. Chinese EFL's show more pauses than English RP speakers. We annotate this kind of pause as '3'. By counting all the 3-level break indices, the percentage demonstrates that Chinese EFL pauses is 30%, on the contrary, the pause of English RP is 22.5%.

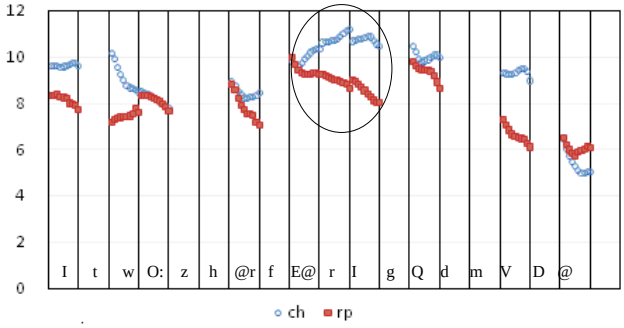

Figure 4 Time-normalized F_0 contours of Sen. 007: It was her fairy godmother!

Figure 4 illustrates the intonation pattern of Sentence 007. In this one, both Chinese EFL and English RP's prominent syllable located on fairy and godmother. From the representation of phonetics, in the level of ID, Chinese EFL adopt lH-m and hM-l while English RP adopt lH-land mH-l. Secondly, in regard with phonological representation, both Chinese EFL and English RP apply the H*L pattern. By counting all the 3-level break indices, the percentage exhibits that Chinese EFL pauses is 21.7%, on the contrary English RP's pause is 18.5%.

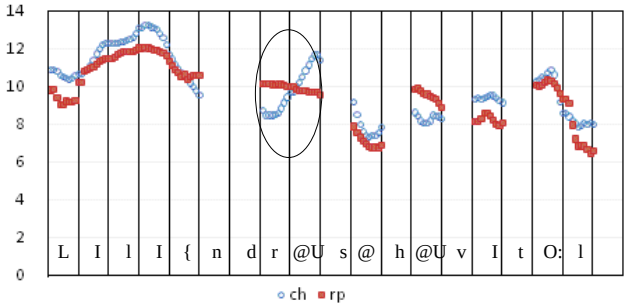

Figure 5 Time-normalized F_0 contours of Sen. 008: Lily and Rosa have it all!

Figure 5 shows the intonation pattern of Sentence 008. In this one, both Chinese EFL and English RP's prominent

syllables distributed on Rosa and all. From the representation of phonetics, Chinese EFL learners adopt lH-l and mH-l while English RP adopt hM-l and mH-l. Secondly, referring to the phonological representation, both Chinese EFL and English RP apply the H*+H*L pattern. By counting all the 3-level break indices, the percentage that Chinese EFL pauses is 26%, on the contrary English RP's pause is 20%.

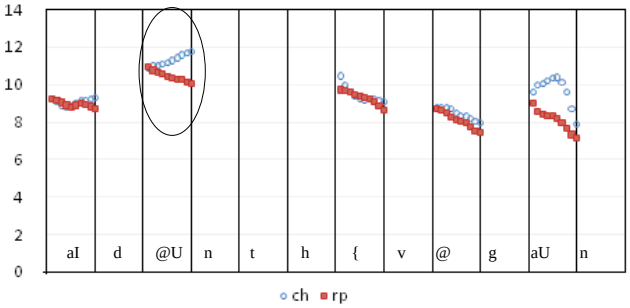

Figure 6 Time-normalized F0 contours of Sen. 012: I don't have a gown!

Figure 6 shows the intonation pattern of Sentence 012. In this sentence, Chinese EFL's realize prominent syllables on don't and gone while English RP Speaker on gone. From the representation of phonetics, in the level of ID, Chinese EFL learners adopt lH-l and mHL while English RP adopt H-l. And, refer to the representation of phonological feature, both Chinese EFL and English RP apply the H*+H*L pattern. By counting all the 3-level break indices, the percentage that Chinese EFL pauses is 27.5%, on the contrary English RP's pause is 10%.

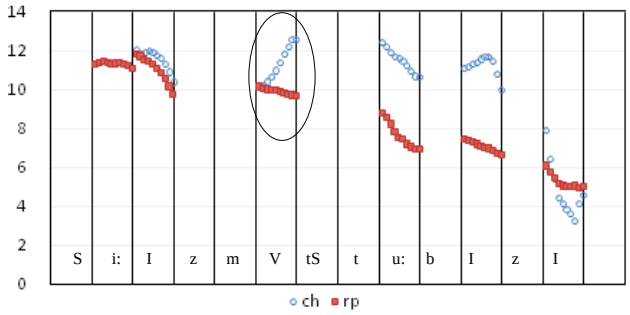

Figure 7 Time-normalized F_0 contours of Sen. 016: She is much too busy!

Figure 7 shows the intonation pattern of Sentence 1. In this sentence, Chinese EFL's prominent syllables are on much and busy while the English RP Speaker are on much. From the representation of phonetics, in the level of ID, Chinese EFL learners adopt LH and hM-l while English RP adopt hM-l. And, concerning with phonological representation, both Chinese EFL and English RP apply the H*+H*L pattern. However, Chinese learners have a very obvious bid up before the falling tone at the intonation tail. By counting all the 3-level break indices, the percentage states that Chinese EFL pauses are 16%, on the contrary English RP's pause is 10%.

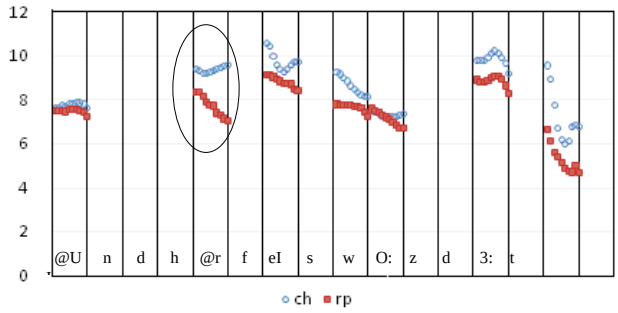

Figure 8 Time-normalized F_0 contours of Sen. 017: And her face was dirty!

Figure 8 shows the intonation pattern of Sentence 3. In this one, both Chinese EFL and English RP's prominent syllables are on face and dirty. From the representation of phonetics, in the level of ID, Chinese EFL adopt mH-l and lH-l while English RP adopt lH-land mH-l. Phonological representation show that, both Chinese EFL and English RP apply the H*+H*L pattern. As we've seen in Sen. 016, Chinese learners have a very obvious bid up before the falling tone of the intonation tail. By counting all the 3-level break indices, the percentage that Chinese EFL and English RP pause is 18%.

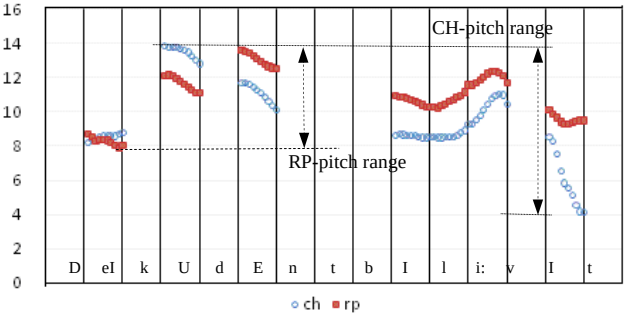

Figure 9 Time-normalized F_0 contours of Sen. 019: They couldn't believe it!

Figure 9 illustrates the intonation pattern of Sentence 1. In this sentence, Chinese EFL's prominent syllables located on couldn't and believe while the English RP Speaker on believes. From the representation of phonetics, in the level of ID, Chinese EFL adopts lH-m and mH-l while English RP adopt mH-l. Secondly, referring to the representation of phonological feature, both Chinese EFL and English RP apply the H*L pattern. But we can see that the pitch range of these two groups are quite different (CH: 143, RP:88). By counting all the 3-level break indices, the percentage that Chinese EFL pauses is 20%, on the contrary English RP's pause is 2%.

4. CONCLUSIONS

From the present research, it can be obtained that the Chinese EFL in exclamatory sentences of fluent speech tend to apply H*L pattern, this case can also be found in the exclamatory production of English RP speakers. However, obvious difference can be seen in those patterns. In the last ID of an intonational phrase, before H*L pattern of Chinese EFL, there's a very obvious bid up of pitch which we consider it as an enhancement of the pitch values. As shown in Figure 3-8， the solid circle part. Even in Figure 9, Chinese EFL and English RP speaker apply nearly the same pattern, the pitch range is distinguished. Referring to research of Chen, the features of Chinese exclamations is associated with wide pitch range and the strong accent. Chinese EFL learns are naturally applying this pattern to English exclamatory sentence. Before Chinese EFL's falling tone (H*L) at the end of a sentence, they usually raise their tone to express exclamatory intonation. By investigating the pitch range of each sentence, the identical phenomenon appears. Chinese EFL has a larger pitch range than that of English RP in a degree of 78.6%.

5. ACKNOWLEDGEMENTS

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