

On L2 English Intonation Patterns by Mandarin and Shanghainese Speakers: A Pilot Study

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Abstract

Chinese intonation is sometimes described as being rather flat, compared to English varieties. As a result of the effect of transfer of L1 patterns to L2, this is expected to influence Chinese speakers' intonation in English. This effect has also been reported in the literature. However, not all Chinese dialects are expected to show this effect equally: dialects that have more tones might be more sensitive to prosody than dialects with fewer tones, which could affect the prosody of these Chinese dialect speakers' L2 English. To investigate this, we recorded English sentences spoken by speakers of Mandarin, a fully-fledged tone language, and by speakers of Shanghainese, which has more lexical tones but in which all these tones except the first are deleted in the phrasal domain. It was found that, on average, speakers of both varieties displayed roughly the same intonation contours in their L2 English, but that the speech by Mandarin speakers showed a wider pitch range than that of the Shanghainese group. We tentatively relate this to the number of lexical tones in the speakers' native varieties.

Keywords: Mandarin Chinese, Shanghainese, L2 English, lexical tone, intonation, pitch variation.

1 Introduction

Chinese intonation is sometimes described as “flatter” or more “monotonous” than English intonation, see e.g. Gong (1991), Guo & Xiao (2010), among others.¹ Gong notes that this has an effect on the intonation in L2 English by Chinese learners who tend to transfer this “flat” intonation to their L2 English.

Why would Chinese intonation be flatter than English? We can think of at least two reasons. First, tone languages tend to use particles where stress languages use pitch to perform a variety of sentence functions. For example, most dialects of Chinese use the question particle 吗 *ma* for interrogative sentences whereas English uses question intonation. This is a general tendency in tone languages (see e.g. Yip (2002), Torreira, Roberts & Hammarström (2014)). Second, and related to this, since tone has a lexical function the pitch movements of the “big wave”, i.e. intonation, should not be allowed to interfere with the pitch movements of the lexical words (the “small waves”) (Chao 1933, 1968), so that the “scope” for intonation is necessarily smaller in tone languages than in stress languages.

However, not all tone languages are equal in this respect. Tone languages differ in the number of tones they distinguish and in the extent to which the lexical tones show up on the phonetic surface. In this paper we investigate the difference between Mandarin and Shanghainese in this respect, where these two aspects actually make opposite predictions as to the scope of intonation in both languages. Let us examine both in turn.

Both Mandarin and Shanghainese are tone languages, but the former has four lexical tones (Duanmu (2007) and many others) whereas the latter has five (Zhu 2006). The tonal systems of Mandarin and Shanghainese are displayed in (1):

¹However, the claim that Chinese intonation (in general) is flatter than English intonation (in general) is very broad and requires further examination; see e.g. Chen (1974), Traunmüller & Eriksson (1995), and Chen (2015) for relevant discussion.

(1) Mandarin:

T₁: 55 T₂: 35 T₃: 214 T₄: 51

Shanghainese:

T₁: 52 T₂: 34 T₃: 14 T₄: 44?

T₅: 24?

The difference in number of lexical tones might entail that Shanghainese speakers need to pay more attention to their pitch variations than Mandarin speakers, which would mean that Shanghainese speakers would tend to vary *less* in their tonal movements than Mandarin ones. We could generalize this to a principle which inversely relates the number of lexical tones in a language to its propensity for intonational excursions (cf. a related functionally-inspired discussion in Liang & van Heuven (2007)). This principle is informally stated in (2):

(2) More tones, less intonation

A second difference between the two tone languages is that in Shanghainese only the phrase-initial lexical tone survives and is spread to non-head morphemes (Chen 2000, Duanmu 2007, Yip 2002, Zhu 1999). In Mandarin, each lexical word retains its tone (at least in principle). This means that, on the phonetic surface, tones in Shanghainese play less of a role than in Mandarin. This would mean that Shanghainese Chinese, and, as a result of transfer, also English spoken by Shanghainese speakers, would employ *more* intonation than Mandarin Chinese and English spoken by Mandarin speakers.

We carried out an experiment on English spoken by Mandarin and Shanghainese speakers, in order to see whether the first (number of lexical tones is related to intonational variation; Shanghainese has more tones so *less* scope for intonational variation) or the second

(surface reduction of tones in Shanghainese leads to *more* scope for intonational variation) hypothesis could be supported on the basis of the L2 English spoken by groups of speakers of the two varieties. This experiment is described in the next section.

2 Methodology

We recorded a number of English sentences spoken by speakers with Mandarin Chinese (standard northern Mandarin) as their first language and by Chinese speakers with Shanghainese as their first language, with the aim of finding out if their intonation in L2 English differed.

2.1 Subjects

The subjects were all females between 21 and 33 years old and were advanced speakers of L2 English, based on the number of years they had learnt English (between 8 and 21 years of formal education, where the Mandarin speakers had received more years of education). They were paid for their participation. Table 1 provides background information on the subjects, who are labelled M₁₋₄ and S₁₋₄.

Table 1: Information on the subjects.

Mandarin speakers	Age	Years Learning English	Shanghainese speakers	Age	Years Learning English
M1	29	16	S1	21	8
M2	28	17	S2	22	9
M3	33	21	S3	21	8
M4	28	19	S4	28	18

2.2 Stimuli

The targets were isolated sentences, almost all taken from Oscar Wilde's novel *The Picture of Dorian Grey*, included long sentences, short sentences, questions, exclamations, and neutral sentences. Different types of sentences were included to check whether Mandarin and

Shanghainese speakers of English might differ in their intonation patterns in specific sentence types, but this was not precisely controlled. All target sentences are included in Appendix 1.

2.3 Procedure

The experiment was conducted in a quiet room at Shanghai International Studies University. Before the recording started, the subjects were given enough time to familiarize themselves with the sentences and the procedure. They were then asked to read the target sentences, self-paced, reading from the computer screen. The recording was made using Praat (Boersma & Weenink 2015), operated by the experimenters. Sentences that had missing words, obvious errors or major hesitations were repeated until the recording of all data was satisfactory. All data were stored on disk as wav files (sampling rate 44.1 kHz).

2.4 Data analysis

The recorded sentences were divided manually into words (many of which were monosyllabic, so we decided not to extract separate syllables), which were then extracted as separate wav files using a Praat script. The minimum, maximum, mean, and standard deviation of pitch in each word were measured using another Praat script (pitch settings: 75 Hz minimum, 600 Hz maximum) and checked manually.

3 Results

We first compared the average pitch of the Mandarin speakers and the average pitch of the Shanghainese speakers for every word in each sentence. It turned out that these averages were very similar. The following two figures (where the numbers on the x-axis correspond to the words in the sentence) illustrate this:

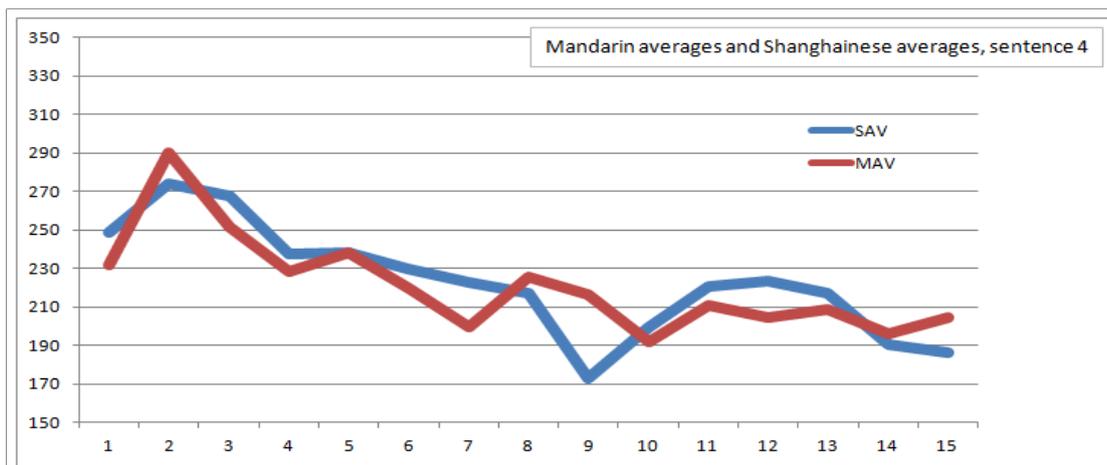


Figure 1: Mandarin and Shanghainese average pitch trackings, sentence 4.

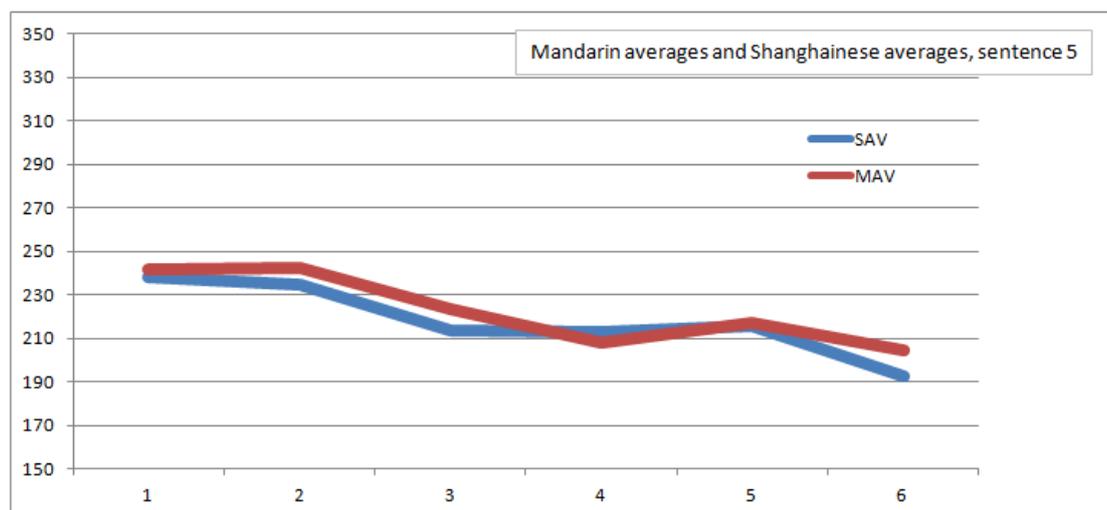


Figure 2: Mandarin and Shanghainese average pitch trackings, sentence 5.

For none of the sentences (regardless of sentence type) was there a significant difference between the Mandarin and the Shanghainese average pitch values, measured syllable by syllable and by position in the sentence, as seen in the graphs above. The mean pitch of the Mandarin and Shanghainese speakers, across all sentences, was almost identical: 229 Hz on average for the first group, and 224 Hz for the second.

Note that the average pitch values, as seen in the two figures above, obscure any individual variation between speakers or between the two groups. We therefore also measured

the minimum pitch (Fmin), maximum pitch (Fmax), and standard deviations (SDs) of the pitch value of every speaker, across all test sentences, measured word by word. The results are shown in Table 2.

Table 2: Fmin, Fmax, Pitch range, Fmean and average SD across all English test sentences for each Mandarin and Shanghainese speaker and for both groups of speakers (in Hz).

	Fmin	Fmax	Pitch range	Fmean	SD
M1	204.4	287.2	82.8	248.7	54.3
M2	202.3	268.7	66.4	235.6	27.9
M3	179.5	236.0	56.5	208.0	23.7
M4	185.7	265.7	80.0	223.9	31.9
M1-4	193.0	264.4	71.4	229.0	34.4
S1	226.0	247.6	21.6	238.2	16.1
S2	202.4	230.5	28.1	216.5	21.6
S3	190.5	230.7	40.2	216.5	24.8
S4	198.7	264.4	65.7	232.7	38.5
S1-4	204.4	243.3	38.9	224.2	25.3

Table 2 shows that the Mandarin speakers in general had a larger pitch range than the Shanghainese ones (71.4 vs. 38.9), although, as pointed out above (and also shown in the table) the groups' average pitch levels were almost identical. Because we were not certain that our Mandarin and Shanghainese subjects were representative of their groups, a Wilcoxon statistical test was done in the R statistical package (R 2005). This yielded a significant result ($W = 157, p = 0.007$). This means that the pitch range of the L2-English sentences in the Mandarin group was significantly larger than that of the sentences in the Shanghainese group.

4 Discussion

The results from the experiment indicate that the pitch range of Mandarin speakers speaking English is generally larger than that of Shanghainese speakers speaking English, although there is little difference between the average intonation patterns of Mandarin and Shanghainese speakers in their L2 English. Recall that all speakers were advanced learners of English; perhaps less advanced speakers of English, who could be tested in a follow-up study, would show different results. Of course, Shanghainese speakers are in general also speakers of Mandarin Chinese, and this was certainly true for our Shanghainese subjects. Moreover, English taught in secondary schools or a university setting will always take place in a predominantly Mandarin-speaking teaching context. This may be a second reason why the L1 of the Shanghainese speakers did not leave much of a mark on the Shanghainese speakers' L2 English.

Following the principle in (2), we would, very tentatively, like to suggest that the difference in pitch range might be related to the number of lexical tones in the two dialects examined here (4 in Mandarin, 5 in Shanghainese). Since Mandarin has fewer lexical tones than the Shanghai dialect, there may be less of a controlling function for intonation in the former dialect, so that Mandarin speakers can vary more widely. To verify this, future research might focus on the question whether there is a difference in pitch range between L1 Mandarin Chinese and L1 Shanghainese intonation, and also compare others dialects with a smaller or larger number of lexical tones than the two dialects examined here.

5 Conclusion

The present study was intended as a pilot study on the intonation of L2 English by Mandarin speakers and Shanghainese speakers. The results of the experiment showed that L2 English intonation does not vary much between these two groups. It was also shown that Mandarin speakers show greater pitch variation and hence had a larger pitch range than Shanghainese speakers, which we tentatively related to the numbers of lexical tones in these two dialects.

Further research could focus on less advanced learners of English and speakers of other dialects, with considerably fewer or more tones than the two varieties considered here.

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Appendix 1: Target sentences

1. The North Wind and the Sun were disputing which was the stronger, when a traveler came along, wrapped in a warm cloak.
2. Don't you like it?
3. When he saw it he drew back, and his cheeks flushed for a moment with pleasure.
4. Would you think it awfully rude of me if I asked you to go away?
5. What odd chaps you painters are!
6. Who wouldn't like it?
7. The highest as well as the lowest form of criticism is a mode of autobiography.
8. Live the wonderful life that is in you! Let nothing be lost upon you.
9. "You really must not say things like that before Dorian, Harry." "Before which Dorian? The one who is pouring out tea for us, or the one in the picture?"
10. Whose property is it?
11. "Is it really finished?" he murmured, stepping down from the platform.