The learnability and teachability of English tones by Chinese EFL learners

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1 Introduction

Intonation is the melody of speech, the changes in the pitch of the voice during the articulation of an utterance. Pitch is the perceptual correlate of (primarily) fundamental frequency, which is the continuous variation in the sounds we perceive as a result of the vibration of the vocal cords (Cruttenden 2001). Intonation, then, can be narrowly described as the movements or variations in pitch to which we attach familiar labels describing levels (e.g.high/low) and movements (e.g. fall/rise), etc. Learning intonation therefore involves learning how the pitch of the voice rises and falls, and how native speakers use this pitch variation to convey linguistic and pragmatic meaning.

Research in the teaching of English pronunciation as a second and foreign language (L2/EFL) over the last decade or so has made quite evident the significance of intonation in the comprehension and production of the target language (Anderson-Hsieh et al 1992; Munro & Derwing 1995; Wells, 2006). Moreover, studies on L2 speech reveal that the intonation of non-native English poses serious intelligibility problems to native speakers of the language (Banjo,1979; Bansal, 1976). However, there is no consensus as to whether English intonation is learnable by EFL learners. On the one hand, intonation is widely regarded as a very difficult thing to teach (Roach 1991;) or seemly impossible to learn (Chun, 1998), or even neither teachable nor possibly learnable (Taylor, 1993). On the other hand, a number of suggestions or recommendations on teaching English intonation have been proposed by practitioners and researchers (e.g. Celce-Murcia et al. 1996; Cross 2002; Flege 1988), yet most of them lack authentic data to show the reliability of the recommended approaches. Accordingly, it is worthwhile conducting an experimental study on the learnability and teachability of English intonation, narrowly English tones, by EFL learners. The problems which this paper intends to tackle, then, are as follows:

1. Can Chinese EFL learners produce English tones properly?
2. To what extent can explicit instruction in English tones facilitate learners' production of them?

2 Methodology

To address the research questions of the present study, a pretest-posttest experimental study was designed and carried out at Jiangsu University, China in 2008.

Subjects

The subjects were 31 sophomore English majors from Jiangsu University. They had learned English for more than 10 years and they were all native-speakers of Mandarin Chinese from Jiangsu Province so as to avoid potential problems caused by the influence of diverse mother tongues. None of them had had prior explicit instruction on English intonation.

Target tones

Chinese is a tone language, which uses tone lexically, whereas English make use of tone intonationally. By combining different pitch levels and contours, native-speakers of English express a range of intonational meanings by means of grammatical, attitudinal, discoursal and sociolinguistical functions (Halliday 1967; O'Connor & Arnold 1973; Cruttenden 1997). Five nuclear tones, frequently used in English, were selected as the target tones for the

present study: high fall (HF), high rise (HR), fall-rise (FR), rise-fall (RF) and complex levels (CL). They were imbedded in carrier words and sentences selected from the textbooks with CDs attached by Roach (2000) and Wells (2006) (See Table 1). The CDs were then used as auditory and articulatory models in the instruction. The words with target tones were categorized into Fall/rise tone non-English words (FRTNEW), Complex level tone non-English words (CLTNEW), One-syllable English words (1SEW) and Two-syllable English words (2SEW).

Categories	**Target tones in carrier words and sentences**
Fall/rise tone non-English words	\ma /ma \ma/ma /ma\ma
Complex level tone non-English words	ˍma \ma \ma_ma \ma ¯˝ma /ma ¯˝ma
One-syllable English words	\ chair \ yes ˅ no / chair ˅ yes / no ˅ chair / yes \ no
Two-syllable English words	/ **mon**key un∧**known** You : mustn't \ **wor**ry. \ **mon**key You : mustn't / **wor**ry. ∨**mon**key un∨**known** You : mustn't ∨**wor**ry.
Note: \ =HF; /=HR; ∨=FR; ∧=RF	

Table 1. Target tones in carrier words and sentences

Treatments and procedures

The pretest was done before 18 hours of instruction in English tones. After a brief introduction to English tones and tone symbols, illustrations of tone realization, and some rehearsal with target tones in carrier words and sentences similar to those to be tested, the subjects were required to read the target tones according to the written material with tone symbols (see Table 1) so that their acquisition rate of the target tones can be explored. During the experiment, all the subjects were exposed to a 2-hour instruction in English tones per week, including lectures on the forms and functions of English tones, perception of English tones produced by native RP speakers and guided imitation practice after the auditory models from the CDs attached to the textbooks. The instruction was explicit in nature and lasted for 9 weeks. In the 10th week, all the subjects were required to pronounce the identical target tones in carrier words and sentences. To reduce the possible test-effects of the pretest, the carrier words and sentence were embedded among other oral tasks such as pronouncing phonetic symbols and a dialogue in English

Data collection & analysis

All the data were collected in a quiet language lab via Cool Edit Pro V2.1and analyzed via Praat with the help of both human perception and acoustic representations of the tones. The data were then rated by the researcher (1 point = correct articulation; 0.5 point = partially correct; null = wrong articulation) and analyzed statistically by Excel and SPSS 14.0.

3. Results and discussions

1)Mean accurate pronunciation of English tones

	HF	HR	FR	RF
Mean	.91	.62	.44	.38
SD	.41	.57	.58	.43
Mean Accuracy rate (MAR)	91%	62%	44%	38%

Table 2. Mean accuracy rate of each target tone

Can Chinese L2 learners pronounce target tones properly? To find the answer to this question, the subjects' pretest production of each target tone was calculated and the mean

accuracy rate of their correct pronunciation was used as an indicator of their acquisition in English tones. The results (see Table 2) show that they had an easy time in producing HF tone (Mean Accuracy rate (hereafter MAR) =91%), but had considerable problems in HR (MAR =62%), particularly in FR (MAR =44%) and RF (MAR =37.5%). This demonstrates that English intonation is, in general, a very difficult thing for L2 learners to achieve (Roach, 1991), though all of them had learned English for more than 10 years

	FRTNEW	CLTNEW	1SEW	2SEW
Mean	.95	.53	.46	.49
SD	.37	.49	.36	.34
Mean Accuracy rate(MAR)	95%	53%	46%	49%

Table 3. Mean accuracy rate of target tones in different contexts

Which contexts help or hinder the acquisition of non-native English tones? The analysis of pretest data (Table 3) shows that most of the L2 learners had the knack of producing fall/rise tone non-English words (MAR =95%), but they were moderately competent to prounuce complex level-tone non-English words (MAR =53%), one-syllable English words (MAR =46%) and two-syllable English words (MAR =49%) . That is, Chinese EFL learners' acquisition of English tones is not satisfactory, particularly the tones with authentic English words (1SEW: MAR=46%; 2SEW: MAR=49%). This indicates the partial learnability by Chinese EFL learners.

2) The effectiveness of English tone instruction.

To what extent can explicit instruction facilitate the learning of English tones? The answer is to be found in a comparison of pretest and posttest data (See Table 4).

As is shown in Table 4, there were marked achievements in the posttest production of target English tones and the mean accuracy rates ranged from 50% to 97%. Moreover, the comparisons between the subjects' pretest and posttest performance also manifest the significant improvement in the production of all the target tones in both 1SEW and 2SEW contexts(1SEW: Sig. = .000/.001/.034; 2SEW: Sig. = .008/.000/.001/.000) These findings provide vital evidence for the teachability of English tones to L2 learners.

	Tone contexts			N	Mean accuracy rate	SD	Improvement rate in the posttest	Paired samples T-test Sig. (2-tails)
Pair1	1SEW	HR	Pretest	31	65%	.576	**27%**	**.000**
			Posttest	31	**92%**	.293		
Pair2		FR	Pretest	31	23%	.528	**32%**	**.001**
			Posttest	31	**55%**	.722		
Pair3		HF	Pretest	31	90%	.400	**8%**	**.034**
			Posttest	31	**98%**	.106		
Pair4	2SEW	HR	Pretest	31	51%	.815	**28%**	**.008**
			Posttest	31	**79%**	.592		
Pair5		FR	Posttest	31	10%	.401	**40%**	**.000**
			Pretest	31	**50%**	.676		
Pair6		HF	Posttest	31	72%	.522	**19%**	**.001**
			Pretest	31	**91%**	.304		
Pair7		RF	Posttest	31	51%	.836	**38%**	**.000**
			Pretest	31	**89%**	.560		

Table 4. Comparison between pretest and posttest MAR of target tones

4.Conclusions

English intonation is learnable for EFL learners, but the accuracy rate is fairly moderate if there's no explicit training in the intonation. The results of the experiment provides hard evidence for the teachability of English tones to EFL learners, if the instruction is long enough in length, explicit in nature and systematic in the process from perception to production. These findings are insightful for L2 intonation pedagogy.

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