

Tone Features of Chinese and Teaching Methods for Second Language Learners

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Abstract

Chinese is a tone language, i.e., pitch cues are used to distinguish different lexical meanings. Chinese tones are important but difficult for foreign learners who acquire Chinese as a second language (L2). This paper provided a systematic discussion on teaching methods, including the teaching methods and materials as well as the teaching sequence of Chinese tones. Based on the tone categories and pitch features of Chinese tones, this paper proposes several effective methods of teaching tones to second language learners. From the perspective of tone categories, there are two methods to enhance tone teaching: (1) applying minimal pairs, which consist of same segments of consonants and vowels but different tones; (2) applying meaningful phrases in the tone order. From the perspective of pitch features, there are three effective methods for tone teaching: (1) utilizing the similarities between musical tones and linguistic tones; (2) utilizing the visual assistance of pitch contours; (3) utilizing multimedia assistance of simple acoustic measurement, which can be realized by a free software called Praat. In addition to tones in isolated citation form, the teaching sequence for tones in non-canonical forms are also discussed. The teaching materials and methods proposed in this paper can help to enhance the efficiency of teaching Chinese tones to L2 learners.

Keywords: tone, Chinese, second language, pedagogy, multimedia assistance

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0 Introduction

Chinese is a tone language, which has “lexically significant, contrastive, but relative pitch on each syllable” according to the definition of tone and tone language by Pike (1976, p.3). Tones are important phonological features of Chinese, which are found difficult for foreign learners who acquire Chinese as a second language (L2). This paper links up the linguistic studies and the language teaching practice, with discussions on Chinese tone features as the theoretical basis and teaching methods for L2 learners as the applications.

Here we take “Chinese” in a broad sense, which is not limited to the Mandarin Chinese (or Putonghua), but also include Cantonese as well. In Hong Kong, “Teaching Chinese as a Second Language” actually includes teaching Cantonese to foreigners. Taking both Putonghua and Cantonese into consideration, which have different tone systems, can also help to propose common teaching methods of tone languages while specify individual features of a certain language/dialect.

In this section, a brief introduction of the tone systems of Putonghua and Cantonese will be provided as a background first. In the following sections, based on the tone categories and pitch features, corresponding teaching methods will be proposed. In the learning process, foreign learners who acquire Chinese as a second language (L2) must build up the concept of tone categories and make correspondence between tone categories and lexical items. The recognition of tone categories is based on the perception and production of pitch features. Thus, these two perspectives are important while interrelated in the learning and teaching of Chinese tones, and they are the foci of this paper. In addition to tones in isolated citation form, we will continue discussing Chinese tones in non-canonical forms, which is also challenging in Chinese as an L2 teaching and learning.

Table 1
Putonghua tone system

Tone category	Traditional category	Pinyin diacritic	Pitch shape	IPA	Numeral transcription	Example
Tone 1	Yin-ping 陰平	—	High-level	˥	55	媽 mā
Tone 2	Yang-ping 陽平	/	High-rising	˨˨˥	35	麻 má
Tone 3	Shang-sheng 上聲	ˇ	Falling-rising	˨˥˨	214	馬 mǎ
Tone 4	Qu-sheng 去聲	\	High-falling	˨˥˨˨	51	罵 mà

Table 1 lists the basic information of Putonghua tone system. The Romanization transcription method of the “Example” column is Hanyu Pinyin. There are four lexical tones in Putonghua, in the order of Tone 1 (abbreviated as T1, henceforth) to Tone 4. According to the names of tone categories dating back to the Middle Chinese, these four tone categories are called Yin-ping, Yang-ping, Shang-sheng, and Qu-sheng, respectively. In the Pinyin transcription system, tones are marked with diacritics (from T1 to T4 as “—”, “/”, “ˇ”, “\”), which are marked on the vowel nucleus of a syllable. These diacritics resemble the pitch shape of these four tones, i.e., high-level, high-rising, falling-rising, and high-falling. Chao (1930/2006) proposed the five-point-scale method to transcribe tones, i.e., locating the lowest pitch point of an individual as 1, the highest as 5, and the equally distributed pitch points in-between as 2, 3, and 4. A graphic illustration of this method is provided in Fig. 2 of Section 2.2. By this method, the tone values of the four Putonghua tones are 55, 35, 214, and 51, and in the IPA transcription system, they are represented as ˥, ˨˨˥, ˨˥˨, ˨˥˨˨.

Table 2
Cantonese tone system

Tone category	Traditional category	Pitch shape	IPA	Numeral transcription	Example(s)	
Tone 1	Yin-ping 陰平 /High-yin-ru 高陰入	High-level / High-falling	˥/˨	55/53 or 5	夫 fu1	福 fuk1
Tone 2	Yin-shang 陰上	High-rising	˥	25	苦 fu2	
Tone 3	Yin-qu 陰去 /Low-yin-ru 低陰入	Mid-level	˥	33 or 3	富 fu3	霍 fok3
Tone 4	Yang-ping 陽平	Low-level / Mid-low-falling	˨/˨	11/21	符 fu4	
Tone 5	Yang-shang 陽上	Mid-low-rising	˨	23	婦 fu5	
Tone 6	Yang-qu 陽去 /Yang-ru 陽入	Mid-low-level	˨	22 or 2	父 fu6	服 fuk6

Table 2 lists the basic information of Cantonese tones. The Romanization transcription method of the “Example” column is Jyutping (The Linguistic Society of Hong Kong, 1993), which will also be adopted in the examples used in this paper henceforth. According to the definition of tones (as stated at the beginning of this section), pitch is the main parameter to differentiate different tones, by which there are six tones in Cantonese, listing as Tone 1 to Tone 6 in Table 2. Meanwhile, according to the tone categories dating back to the Middle Chinese, there are nine tones in Cantonese, namely Yin-ping, Yin-shang, Yin-qu, Yang-ping, Yang-shang, Yang-qu, High-yin-ru, Low-yin-ru, and Yang-ru. The categories of “Ping” “Shang” “Qu” “Ru” were the four tone categories in Middle Chinese, and the “Yin” tones were with voiceless consonant initials in Middle Chinese, while the “Yang” tones were with voiced tones. The “Ru” tones, or the so-called “Entering Tones”, are

those with occlusive codas and sound very short. In terms of pitch, Yin-ping and High-yin-ru, Yin-qu and Low-yin-ru, Yang-qu and Yang-ru are the same tones. In the six-tone system, there are two tones with level and falling free variants: Tone 1 (high-level variant and high-falling variant, while the dominant variant is a high-level tone in Hong Kong) and Tone 4 (low-level and mid-low-falling variants); there are two rising tones: Tone 2 (high-rising) and Tone 5 (mid-low-rising); and there are two level tones: Tone 3 (mid-level) and T6 (mid-low-level). The abundant tones in Cantonese make it not easy to learn for foreigners.

1 Teaching Methods Based On Tone Categories

The L2 learners of Chinese should build up the concept of tone categories and make correspondence between tone categories and lexical items first. In order to enhance the conceptualization of tone categories of Chinese, two teaching methods are proposed here, i.e., to apply minimal pairs of tones, and to apply meaningful phrases in tone sequence. The first method can help learners to reduce the interference of different segmental features, while the second method can help learners to remember the sequence of different tone categories and thus more easily judge the tone category of a certain lexicon.

1.1 Application of minimal pairs of tones

Minimal pairs are those lexicons with only one distinctive phoneme that differentiate each other, which signify different lexical meanings. Minimal pairs of tones are those syllables that with identical segments of consonants and vowels, but distinctive by different pitch features. For example, in the “Example” column of Table 1, “媽 mā, 麻 má, 馬 mǎ, 罵 mà” is a whole set of minimal pairs of Putonghua tones, which consist of the same consonant and vowel segments of “ma”. In the “Example” column of Table 2, “夫 fu1, 苦 fu2, 富 fu3, 符 fu4, 婦 fu5, 父 fu6” is a whole set of minimal pairs of Cantonese tones, which have the same segments of “fu”.

In teaching Chinese tones, the whole sets of minimal pairs of tones can be applied as the teaching materials. The advantage of using this kind of language material is that all the segmental features are the same and the pitch features of different tones can be maximized, which can help learners to contrast different tones.

Although there are many minimal pairs of tones in Putonghua and Cantonese, not all of them are suitable materials for teaching and learning. Firstly, the syllable chosen should have meaningful lexicons that cover all the tone possibilities. For example, the syllable “ma” in Putonghua has lexicons of “媽 mā, 麻 má, 馬 mǎ, 罵 mǎ”, which can cover all the four tones in Putonghua. They can serve as useful teaching materials for illustrating tones in Putonghua. For a syllable like “ta”, although there are lexicons of “他 tā 塔 tǎ 踏 tà”, there is no lexicon of “tá”. Thus, Tone 2 is missing for “ta” syllable and this “ta” set is not a complete set, which is not ideal for teaching of tones. Secondly, the lexicons should be easy and frequent words. For example, “馬 mǎ” and “媽 mā” are homophonic, but for the minimal pairs of “ma” set, “馬 mǎ” is a much better choice since it is an easier and much more frequent word compared with “媽 mā”. Thirdly, polyphonic words should be avoided. For example, in the “ma” set, it is not good to use “抹 mā” as the example for Tone 1 because “抹” has two pronunciations of both “mā” and “mǒ”. If the polyphonic words are provided to L2 learners as examples, they will feel confused.

According to the above principles, here are some examples of minimal pairs of tones other than those listed in Table 1 and Table 2, which can be applied in tone teaching.

Putonghua:

yi set: 醫 yī, 姨 yí, 椅 yǐ, 意 yì

shi set: 詩 shī, 時 shí, 史 shǐ, 事 shì

fan set: 翻 fān, 煩 fán, 反 fǎn, 飯 fàn

yuen set: 冤 yuān, 圓 yuán, 遠 yuǎn, 願 yuàn

you set: 優 yōu, 油 yóu, 有 yǒu, 右 yòu

Cantonese:

ji set: 醫 ji1, 椅 ji2, 意 ji3, 兒 ji4, 耳 ji5, 二 ji6

si set: 詩 si1, 史 si2, 試 si3, 時 si4, 市 si5, 事 si6

fan set: 芬 fan1, 粉 fan2, 訓 fan3, 焚 fan4, 奮 fan5, 份 fan6

jyun set: 淵 jyun1, 苑 jyun2, 怨 jyun3, 圓 jyun4, 遠 jyun5, 願 jyun6

jau set: 優 jau1, 柚 jau2, 幼 jau3, 油 jau4, 有 jau5, 右 jau6

It should also be noted that the application of minimal pairs of tones in teaching is especially effective for L2 learners in their initial stage of studying Chinese. For more experienced L2 learners, they should get more exposure to different lexicons and strengthen their tone categorization through their accumulating vocabulary.

1.2 Application of meaningful phrases in tone sequence

Tone sequence refers to the fixed order of tones in a language/dialect, e.g., tones in the order of Tone 1, Tone 2, Tone 3, and Tone 4 in Putonghua, and tones in the order from Tone 1 to Tone 6 in Cantonese. The purpose of asking the L2 learners to memorize the tone sequence is to help them to conceptualize the correspondences between tone categories and tone features. In addition to the minimal pairs of tones (as discussed in Section 1.1), which are in tone sequence, some meaningful phrases are also accidentally in tone sequence, which are also useful materials for tone teaching. Although they are composed of different segments, they are “natural” language materials and provide a “real” language studying context for L2 learners, which can help them to memorize the tone categories in an easy and interesting way. Below are some such kind of materials:

Putonghua:

千奇百怪 qiān qí bǎi guài

山明水秀 shān míng shuǐ xiù

公園裏面 gong yuán lǐ miàn

新年晚會 xīn nián wǎn huì

Cantonese:

番茄醬牛腩麵 (一百碟) faan1 ke2 zoeng3 ngau4 nam5 min6 (jat1 bak3 dip6)

差佬去元朗度 (捉惡賊) caai1 lou2 heoi3 jyun4 long5 dou6 (zuk1 ok3 caak6)

三點半嚟我度 saam1 dim2 bun3 lai4 ngo5 dou6

香水貴唔買住 hoeng1 seoi2 gwai3 m4 maa5 zyu6

The first two Cantonese examples contain a tri-syllabic phrase in parenthesis, which are of “Ru” tones mentioned in the “Introduction” section. They contain occlusive codas, sound short, and correspond to Tone 1, 3 and 6 according to pitch features.

Since these meaningful phrases are impressive, if L2 learners can correctly pronounce all the tones of these phrase, they can get a useful reference for tone categories when they meet new lexicons. Take “新年晚會” of Putonghua as an example. L2 learners can easily remember this phrase well, so that they can count their fingers for the tone categories: “新” is Tone 1; “年” is Tone2; “晚” is Tone3; and “會” is Tone 4. When they meet a new lexicon, they can compare the tone of that lexicon with “新”, “年”, “晚”, and “會” one by one and judge whose tone sound the same, and thus identify the tone category of that lexicon. Thus, meaningful phrases in tone sequence are useful referential tools for L2 learners to learn Chinese tones.

2 Teaching Methods Based On Pitch Features

Since pitch is the primary parameter to differentiate tones, the perception and production of pitch features are of extreme importance for the teaching and learning of tones. Here three methods are proposed to help L2 learners of Chinese to master the manipulation of pitch for tones, with assistance from

multiple cues and sensations. The first method is to utilize musical tones, whose primary parameter is also pitch. The second and third methods are based on visual assistance, which involve synesthesia of auditory and visual cues. The second method is to apply the five-point-scale method proposed by Chao (1930/2006) and visualize the tone values as tone graphs, which are displayed to L2 learners of Chinese to enhance the understanding of pitch features. The third method is based on the acoustic measurement of f_0 , which is the physical parameter of pitch. This method needs assistance from multimedia application, while can provide a feedback of the actual pronunciation of tones, which are more interactive. With more convenient computer techniques, the third method can be applied more widely in L2 teaching and learning.

2.1 Musical tones versus linguistic tones

Both musical tones and linguistic tones involve pitch manipulation, and pitch is their primary parameter. Thus, when teaching linguistic tones, L2 learners can get help from the assistance of their existing musical skills. Previous studies reported that musical experience shapes human brainstem encoding of linguistic pitch patterns (Wong et. al. 2007). Although many people may claim that they have not received any musical training, at least most of them have experience of listening to music and singing by themselves. From their previous experience and skills of music, L2 learners can more easily discern whether a tone is high or low, whether it is level, rising, or falling.

In fact, there was a tradition to use musical notes for transcribing linguistic tones, e.g., Jones & Woo (1912) transcribed the six tones in Cantonese with musical tones, as shown in Fig. 1. In the modern classroom, by musical instrument or vocal singing, teachers can firstly make a musical tone that resembles the pitch features of a linguistic tone, including pitch register (high, mid-high, mid, mid-low, and low) and pitch configuration (level, rising, and falling). For example, as the first step of illustrating Cantonese tones, teachers can make musical tones according to the musical notes displayed in Fig. 1.

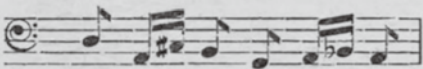
The musical tones are usually found easier to master than a linguistic tone, and thus are a good first step for learning linguistic tones. However, after mastering the basic features of the tones, L2 learners should be aware of the differences between musical tones and linguistic tones.

Ho & Ho (2007) observed that foreign learners very often follow a static framework prescribed in textbooks or conceived of by themselves in terms of musical scales too rigidly when learning tone languages in general and Cantonese in particular, which always make their speech too melodious (Ho & Ho, 2007, p. 65). They proposed the reason for this phenomenon is that a musical scale is static, while a linguistic tone scale is dynamic (Ho & Ho, 2007, p. 66).

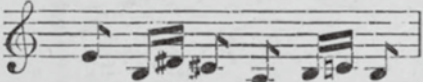
Fig. 1

Musical notes for transcribing tones in Jones & Woo (1912: ix)

I cannot help feeling that the difficulty of the tones is generally much exaggerated. Anyone who has a musical ear can learn them in a very short time by practising the following tune, singing it on any vowel or on one of the consonants *m*, *n* or *ŋ* until it is firmly fixed in his mind :



For ladies' voices this tune might be transposed thus :



Zhang (2016 & 2017) observed that Cantonese tones are preserved in both speaking and singing, i.e., native speakers can clearly identify the lexical tones in both speech styles. Musical tones and linguistic tones simultaneously overlap in Cantonese song singing. Through a series of acoustic experiments, Zhang (2016 & 2017) further pointed out that linguistic tones in speaking (even in isolated citation form, the shortest form of speaking) are influenced by the universal declination intonation, while the musical tones are free from the declination intonation. Thus,

to avoid their speech to be too melodious, the L2 learners of Chinese should impose the declination intonation to the tones of their speech.

Therefore, by utilizing musical tones to enhance linguistic tone learning, there are two steps: firstly, using musical tones to help identifying the features of pitch register and pitch configuration; secondly, to realize the differences between musical tones and linguistic tones, especially to add the declination intonation to the linguistic tones.

2.2 Visual assistance of pitch contours

The synesthesia of auditory sense and visual sense is the basis of applying visual cues to assist tone learning. As mentioned in the introduction section, Chao (1930/2006) proposed the five-point-scale method to transcribe linguistic tones. A graphic illustration of this method is provided in Fig. 2, which is self-evident for the mechanism of this transcription method. With five-point-scale as a referential background, Putonghua tones and Cantonese tones can be located and shown as Fig. 3 and Fig. 4 below, which are more straightforward compared with pure numbers of tone values.

Fig. 2

Graphic illustration of Chao (1930/2006)'s five-point-scale method

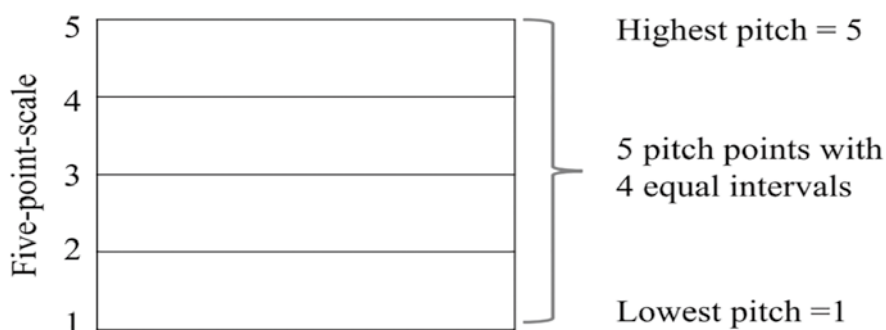


Fig. 3

Tone graphs of Putonghua tones according to five-point-scale

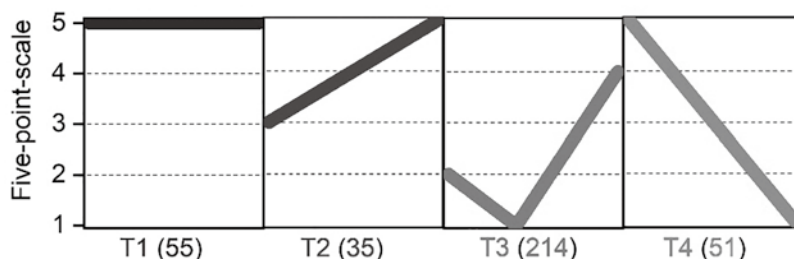


Fig. 4

Tone graphs of Cantonese tones according to five-point-scale

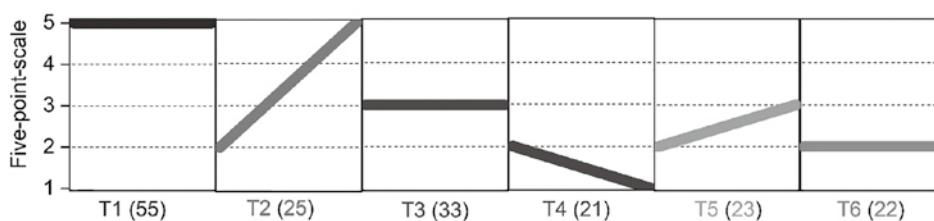


Fig. 3 and Fig. 4 can be applied in Putonghua and Cantonese tone teaching. With the visual assistance of the pitch contours depicted in these graphs, L2 learners of Chinese can have a more “concrete” impression of the pitch trajectories of tones. In classroom teaching, Fig.3 and Fig. 4 can be displayed to students directly to illustrate the pitch features of tones.

In addition, teachers can also gesticulate the pitch contours, which are also vivid visual cues for students to better understand the pitch trajectories of tones. Taking Putonghua tones as examples for teaching tones with gestures in classroom: raising one’s hand to a high position and gesticulating a level line can represent Tone 1; motion starting from a mid-point and ending at a high point can stand for Tone 2; gesture starting from a mid-low-point, declining to the lowest point, and then raising to the mid-high point is a visual cue for Tone 3; and waving one’s hand from the highest point to the lowest point is the sign of Tone 4. Teacher can pronounce an example of a certain tone and show the gesture simultaneously, which can strengthen the synesthesia effect.

2.3 Multimedia assistance of acoustic measurement

The application of acoustic measurement to linguistic research has a long history, which has been very helpful and provided objective and accurate data for phonetic studies. For instance, the acoustic data displayed in Fig. 5 and Fig 6 objectively and accurately show the pitch features of Putonghua tones and Cantonese tones, respectively. They can also serve as a reference of the “standard pronunciation” of tones produced by native speakers.

Fig. 5 and Fig. 6 are the acoustic data of tones, while the tone graphs of Fig. 3 and Fig. 4 in Section 2.2 are based on the five-point-scale, which depend on the traditional perceptual skills of pitch. Fig. 3 and Fig. 4 stand for a canonical form of tones, while Fig. 5 and Fig. 6 are the realization of tones, which may be influenced by factors in speech, such as context effects, declination intonation, etc. By both methods, the auditory pitch is visualized as contours in the figures. The auditory signal is ephemeral while the visualized data allow us a chance to capture a static window for detailed observations and comparisons.

Fig. 5
Mean f_0 contours of Putonghua tones by Xu (1997:67)

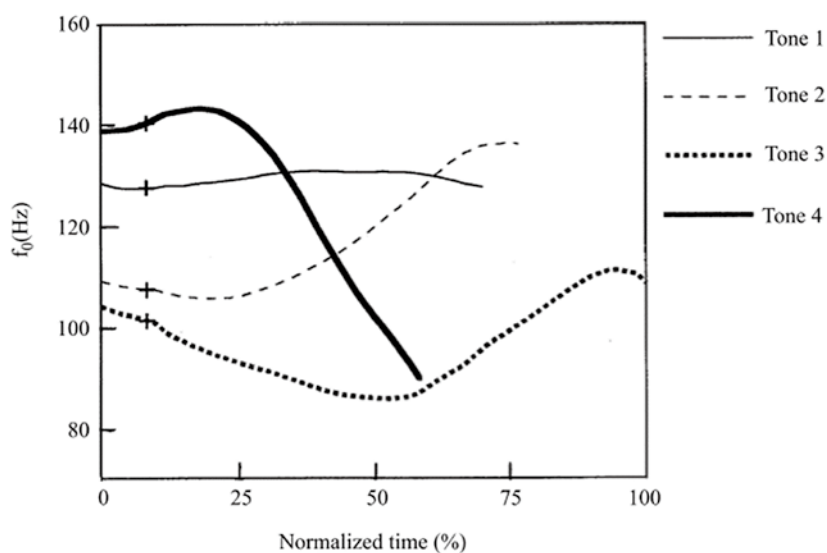
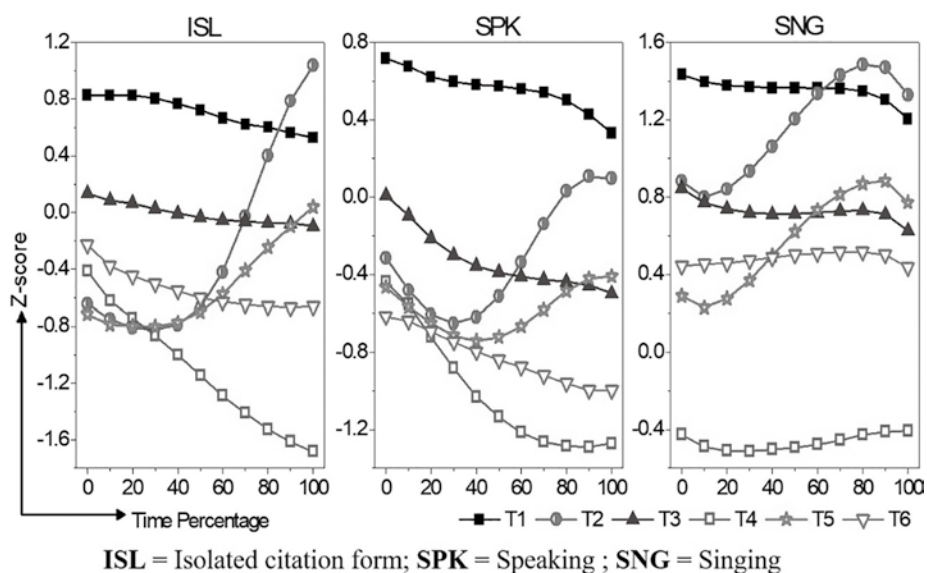


Fig. 6 Mean f_0 contours of Cantonese tones by Zhang (2016:103)



Previously, acoustic measurement was very expensive and time-consuming, which was only applied in research and conducted in laboratory. In recent decades, with more advancing computer techniques, it is more and more convenient to conduct acoustic measurement. A free software called Praat (Boersma & Weenink, 2018) is a powerful tool for obtaining various types of acoustic data, including f_0 , which is the physical parameter of pitch. Praat also has a function of making audio recordings. Thus, a microphone connected to a computer (or the built-in microphone of the computer), together with the Praat software, can already set up a simple set of equipment for doing acoustic analysis.

With regard to the convenience of conducting acoustic measurement nowadays, this technique can step out of laboratory and enter our classroom of L2 learning and teaching. The application of acoustic measurement is no longer limited in theoretical research but can expand to assist L2 learning and teaching by providing feedback for pronunciations. Wang (2017) conducted a pilot study of applying acoustic measurement to teaching Chinese as L2 among foreign learners and found this method efficient.

Fig. 7

Spectrogram for a set of minimal pairs of Putonghua tones by Praat

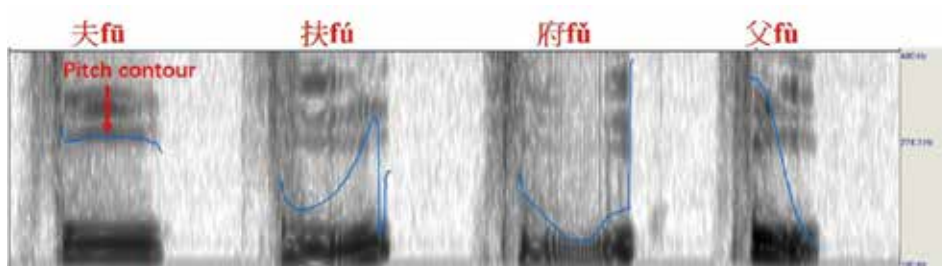


Fig. 8

Spectrogram for a set of minimal pairs of Cantonese tones by Praat

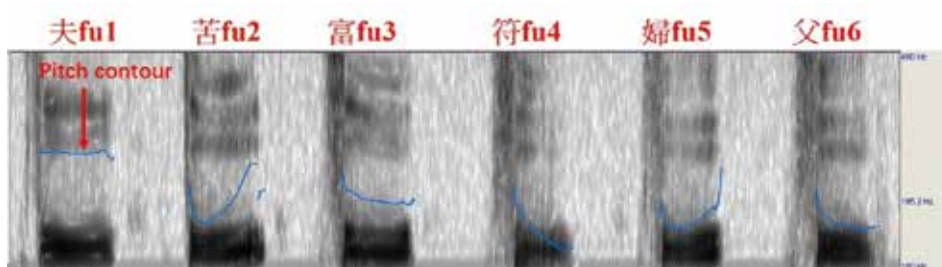


Fig. 7 and Fig. 8 are two examples for illustrating the application of acoustic measurement in teaching and learning Chinese tones. Firstly, audio recordings of targeted syllables are made and saved as WAV or MP3 files. The spectrograms shown in Fig. 7 and Fig. 8 are a set of Putonghua tone minimal pairs and a set of Cantonese tone minimal pairs, respectively. In fact, the recording list is not limited to minimal pairs. Any Chinese syllables can be recorded according to teaching and learning purpose. Secondly, open the sound file in Praat and click the “View & Edit” button, which will generate a spectrogram like Fig. 7 and Fig. 8. The pitch contour of each syllable is signified as a blue thread in the spectrogram (as being pointed in Fig. 7 and Fig. 8). It should be noticed that at the very beginning and ending parts, the blue thread is not steady and may have abnormally dramatic falling or rising, which should not be taken into account of linguistic tones. We usually only focus on the steady contour of the main body part.

Thirdly, we can compare the pitch contours in the spectrogram with the “standard pronunciation” pitch contours in Fig. 5 and Fig. 6, and then see whether there is a deviation. Fourthly, if there is a deviation, L2 learners should try to improve their pronunciation to approximate the “standard pronunciation”.

The above four steps can be repeated again and again to minimize the difference between an L2 learner’s own pronunciation and the “standard pronunciation”. This method can provide objective evaluation of one’s pronunciation and hints for direction of further improvement. The four steps described above actually form a circle of “production – comparison – correction”.

Saito (2011) and Saito & Lyster (2012) verified Form-Focused Instruction (FFI) and Corrective Feedback (CF) are effective ways to improve the L2 pronunciation accuracy. FFI draw attention to target language features that learners would otherwise not use or even notice in communicatively oriented classroom input (Spada, 1997). CF is a teacher’s reformulation of all or part of a student’s utterance, minus the error, with recasts as the most frequent type of CF in a wide range of instructional settings. By using minimal pairs of tones, we can provide FFI to L2 learners of Chinese. By displaying acoustic data spectrogram and comparison with “standard pronunciation”, CF can also be provided. Thus, both FFI and CF elements can be found in the teaching method proposed in this section.

Compared with traditional CF method, which is led by teachers, the multimedia-assisted teaching and learning proposed here needs a preparation phase, when students are instructed how to make audio recordings, how to get spectrograms in Praat software, how to observe pitch contours, and how to compare them with the “standard pronunciation”. However, all these steps are not difficult to follow, and students can easily manage the learning circle by themselves. Since students can try and learn on their own pace, this multimedia-assisted method also has an advantage of coordinating individual learner’s diverse levels and needs.

3 Teaching Non-Canonical Forms of Tones

Teaching Chinese tones should be in the order from easy to difficult step by step. Thus, tones in isolated citation form will be introduced firstly, with materials, assistance and methods discussed above. However, that is not the end of Chinese tone teaching. Tones in isolated citation form can be regarded as in a canonical form. In actual daily communication, there are frequently circumstances of tones in non-canonical forms. When students can master the isolated citation form well, teachers should teach them the more complicated rules of tone variants in non-canonical forms. This is a more advanced stage of tone teaching, which is also challenging.

For the non-canonical forms, here we mainly focus on the Tone 3 sandhi and the neutral tone in Putonghua, as well as the changed tones in Cantonese. In Putonghua, Tone 3 has complicated tone sandhi rules and uses different variants in different contexts:

(1) Variant 214: In isolated citation form or at the end of an utterance, Tone 3 is pronounced fully as its falling-rising variant, i.e., with the tone value of 214 according to the five-point-scale method.

(2) Variant 21: If Tone 3 is followed by a syllable of a tone other than Tone 3, it is half-pronounced as the first half without the rising ending, i.e., a low-falling tone with the value of 21.

(3) Variant 35: If Tone 3 is followed by a syllable of Tone 3, it changes to a totally different variant, a high-rising contour of 35, which resembles Tone 2 in Putonghua. Example: 老 lǎo 鼠 .

Take a Tone 3 syllable “老 lǎo” as an example. In isolated “老 lǎo” and in the word of “敬老 lǎo”, the syllable “老 lǎo” is pronounced as the Variant 214. In the words of “老 lǎo 師”, “老 lǎo 實”, and “老 lǎo 大”, “老 lǎo” is pronounced as the Variant 21. In the word of “老 lǎo 鼠”, “老 lǎo” is pronounced as the Variant 35.

Norman (1988, p. 146) mentioned two kinds of contextual variants of tones. The first kind is defined as “phonetic sandhi”, for which “the changes that

take place may be no more than phonetic variants or allophones of the tone in question”. The second kind is “phonemic sandhi”, for which “the new shape that a tone assumes in a given context may actually coincide with the value of another distinct tone in the same context”. The Variant 21 should be a “phonetic sandhi” while the Variant 35 should be a “phonemic sandhi”.

Regarding different types of sandhi, teachers should also adopt different teaching methods. For phonetic sandhi, teacher should demonstrate the different phonetic features of the variants. They should emphasize that Tone 3 in isolated citation form or at the end of an utterance should turn to a long rising part after the low-falling beginning, while should turn to be a short low-falling contour when there is a non-Tone-3 syllable following it. For the phonemic sandhi of T3, teachers can just tell the rules of substitution directly, i.e., $T3 + T3 \rightarrow T2 + T3$.

Putonghua also has another important phenomenon that involves tone variation: the neutral tone (or zeroth tone, 輕聲 qīng shēng). For example, in “爸 bà 爸 ba”, “我 wǒ 們 men”, and “走 zǒu 吧 ba”, the second syllable of the words are pronounced as the neutral tone. Regardless of the original lexical tone, if the tone of a syllable becomes the neutral tone, it is “de-emphasized” and sounds extraordinarily short and light. The neutral tone usually happens when it is a postfix or a functional word (auxiliary word, sentence-final particle, etc), which is an indicator of grammaticalization. Different from the Tone 3 sandhi, which depends on the phonetic context, the neutral tone is morphologically derived by nature.

Cantonese also has a kind of morphologically derived tones, which are called changed tones, or modified tones (in some previous literature it was romanized as *pinjam*). For example, “蛋 dan3” in “雞 gai1 蛋 dan2”, “兒 ji4” in “乞 hat1 兒 ji1” are pronounced as changed tones of a high-rising and a high-level tones, respectively. There have been a lot of literature mentioned this phenomenon (Bauer & Benedict, 1997; Chao, 1947; Cheung, 1969; Hashimoto, 1972; Matthews & Yip, 1994; Yip, 1990; Yu, 2007; Zong, 1964). The changed tones in Cantonese usually signal familiarity or diminutiveness, or denote the nominalization of a

verb, or indicate various other complicated semantic nuances. There are two kinds of phonological output of the changed tone: one is high-level (with tone value of 55), and the other is high-rising (with tone value transcribed as 25 or 35 in the literature). The high-rising changed tone is a more frequent form.

For both the Putonghua neutral tone and the Cantonese changed tones, since they are morphologically derived tones, they are more closely related to lexicons. Thus, teachers should prepare a long list of words that use the neutral tone of Putonghua or the changed tones of Cantonese. The learning and teaching of these morphologically derived tones should be conducted through the exposure to a large amount of lexicon examples.

To sum up, the teaching methods should be adjusted according to the essence of the non-canonical forms of tones. For the tone sandhi that mainly depends on phonetic context, teachers should strengthen the perception and production of phonetic features and arouse the phonetic awareness for the sandhi rules through practices repetitively. Several lexicon examples are enough for illustrating and practicing purposes. For both the Putonghua neutral tone and the Cantonese changed tones, which are morphologically derived and more closely related to lexicons, not only the phonetic features of them should be displayed to L2 learners, but also a large amount of lexicon examples should be provided.

4 General Discussions and Conclusions

Based on the features of Chinese tones, this paper systematically discussed the tone teaching materials and methods for L2 learners of Chinese, including Putonghua and Cantonese. Both the linguistic studies of tones and the pedagogical applications for L2 acquisition are linked up in this paper. The linguistic studies of tones provide a solid theoretical basis for the pedagogical applications. In return, the pedagogical applications make the linguistic studies more practical and meaningful.

Tone categories and pitch features are two important perspectives for Chinese tones, which also build up the framework for proposing teaching materials

and methods of tones in canonical form. To enhance the memorization of Chinese tone categories, two kinds of teaching materials are suggested here: (1) minimal pairs of tones; and (2) meaningful phrases accidentally in the order of tone categories. To assist better perception and production of pitch features of tones, three teaching methods are recommended: (1) to get reference from musical tones; (2) to visualize pitch contours; (3) to conduct simple acoustic measurement as an objective feedback of one's pronunciation.

In addition to the Chinese tones in canonical form, this paper further discusses the non-canonical forms of tones, including Tone 3 sandhi and the neutral tone in Putonghua, and the changed tone in Cantonese. It is suggested that different teaching methods should be adopted according to the nature of the non-canonical forms of tones. For the tone variants that depend on the phonetic context (e.g., Tone 3 sandhi variants), a clear illustration and more practices on a few word examples are suggested. For morphologically derived tones, such as the neutral tone in Putonghua and the changed tones in Cantonese, practices should go with a large amount of lexicon examples.

In sum, this paper starts from one end of linguistic studies of Chinese tones and reaches another end of teaching method for L2 learners. We propose the main framework of the teaching materials and methods for Chinese tones, which is a first step of applying linguistic studies to L2 teaching and learning of Chinese. Further empirical studies should be conducted later to verify the effectiveness and efficiency of the teaching methods proposed in this paper, e.g., visual assistance of pitch contours and multimedia assistance of acoustic measurement.

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漢語聲調的特點與對外漢語教學的方法

張凌

摘要

漢語的一個顯著特點是聲調語言，這在對外漢語教學中既是重點也是難點。本文系統地探討了對外漢語聲調教學的方法，包括教學中可使用的材料、手段以及注意事項等。從漢語聲調本身的特點出發，有兩種教學方法可以應用：第一，巧用聲調的最小語音配對，通過辨識詞義和反復朗讀讓留學生熟習國語的四個聲調。第二，巧用按聲調順序排列的詞組或成語，幫助留學生記憶和熟習漢語的聲調。若從音高的特性和呈現方式出發，以下幾種方法也可以幫助留學生掌握漢語的聲調：第一，巧用音樂音高或語調音高和聲調音高的耦合訓練學生的聲調聽辨能力。第二，巧用聲調音高曲線的視覺形象，幫助留學生掌握漢語聲調的調高和調形。第三，巧用簡單的語音測量（在免費軟體 PRAAT 下完成）輔助聲調教學。除了標準字調的教學，本文還探討了變調的教學。本文提出的教學資料和方法，能幫助二語學習者更有效地學習漢語的聲調。

關鍵詞：聲調 漢語 第二語言 教學法 多媒體輔助