

Research Proposal for Applying for a Jiede Empirical Research Grant for Chinese Pedagogy/Chinese Applied Linguistics

Yang Chunsheng
The Ohio State University

I. Title of the study

The acquisition of Mandarin prosody by American CFL Learners

II. Research questions

Mandarin Chinese is a tonal language, in which tones are lexically specified. Intonation also plays an important role in Mandarin Chinese, through which different pragmatic functions are conveyed (Cao, 2002, 2004; Xu, 2005, among others). Most studies on the acquisition of Mandarin prosody are focused on the acquisition of the tones (Bent, 2004; Chen, 1997, 2000, and so on). Viger (2007) is the only study that investigates the acquisition of utterance-level prosody of Mandarin by American learners.

My project aims to investigate the acquisition of Mandarin prosody by American learners of Chinese as a Foreign Language (CFL). Specifically, the following questions are to be addressed:

1) What are the patterns of intonational and temporal structuring in L2 Mandarin speech, and what are the deviations as compared to L1 Mandarin speech?

2) How do the intonational and temporal organizations at different prosodic levels influence tonal production in L2 Mandarin speech?

III. Literature review

Some studies have been conducted on the acquisition of Mandarin prosody by English-speaking American adult learners/listeners.

Chen (2000) investigates the Mandarin tonal errors produced by English-speaking American adults. He proposes three mechanisms when accounting for the tonal errors: 1) the transfer of English intonation and sentence stress; 2) avoidance strategy (avoiding some tones), and 3) developmental errors, e.g. the inconsistent or undesirable productions of tones (e.g., the consistent replacement of a particular tone by another). Viger (2007) examines the acquisition of Mandarin utterance-level prosody by American CFL learners. She finds that in L2 Mandarin speech, there is a striking absence of the utterance-level prosody in L1 Mandarin, e.g., the global rising of pitch throughout Mandarin echo and yes/no questions. Viger also finds the lack of transfer of

global English prosodic contours into L2 Mandarin speech. However, Viger does find some transfer effects on the utterance-final syllables: L1 English speakers imported a final-syllable rise on the final syllable in Mandarin echo and yes/no questions. A range of possible explanations are offered in Viger (2007) to explain why transfer did not occur more extensively and why in particular it was confined to the utterance-final positions: 1) the limited online processing resources, namely the global prosody is sacrificed for the sake of local prosody, 2) insufficient evidence in the L2 input for the global prosody, as compared to the local prosodic phenomena, 3) lack of explicit instruction, 4) slow speech rate, and 5) although L2 speakers produced both local and global prosody, they confined their productions to syllable-length windows of time, without the long-range intonational planning (Viger, 2007: 102-103).

Chen (2004) suggests that the transfer of English intonation and sentence stress is partially responsible for the tonal errors in L2 Mandarin speech. By contrast, Viger (2007) only finds utterance-final prosodic (i.e., intonation) transfer, without the transfer of utterance-level prosody. One possible explanation for the divergent findings in Chen and Viger might be that they examine the prosody at different levels: at the lexical word level in Chen and at the utterance level in Viger. In addition, there is another possibility that the so-called L1 transfer effects in Viger are not really transfer, but might actually stem from the learning strategies shared by language learners, i.e., to represent the question intonation with the utterance-final rise, echoing the short-period processing of L2 prosody (Viger, 2007). On the other hand, careful examination reveals that both Chen's study and Viger's study have some problems. Chen (2004) analyzed the tonal errors without taking into consideration the prosodic constituent they are couched in. Moreover, Chen's approach of analyzing tonal errors is problematic. Chen extracted the tones from spontaneous speech and asked human judges to judge the accuracy of the produced tones. However, in so doing, even the tones from the speech by native speakers are likely to have a large percentage of errors, due to the co-articulation of tones in context (Xu, 1994; Bent, 2004). As for Viger's study, the lack of the global transfer effects might be attributed to her methodological problems: 1) Viger only examined the average pitch and the pitch at 20 milliseconds' (ms) interval in a syllable, without taking into account the F0 high and/or low targets of the syllable, and the F0 top line and base line of a phrase/chunk, which have been shown to be important in Mandarin prosody (Shen, 1985, 1994; Lee, 2004); and 2) Viger only examined utterance-level prosody, without taking into account the prosody at the prosodic constituents smaller than the utterance.

Building on the previous studies and intending to fill the gaps in previous research, my research aims to investigate the acquisition of Mandarin prosody by CFL learners, starting with the examination of the utterance-level prosody, followed by the examination of prosody at the intermediate prosodic constituents, and finally the tonal error analysis.

IV. Methodology

(1) Materials: Short utterances will be used in this study. Bent (2005) and Xu (1994) have found that the phonetic contexts have great influence upon the tonal production and perception. Drawing on Xu's¹ concepts of the "compatible" and the "conflicting" contexts, compatible and conflicting tonal sequences will be used. The compatible tonal sequences are alternating sequences of tone 2 and tone 4, whereas the conflicting tonal sequences are the all tone-2 and all tone-4 sequences. In addition, all tone-1 and tone-3 sequences will be used as well. Some other mixed tonal sequences and compound sentences will also be constructed and used in the study;

(2) Subjects: Ten intermediate-level and ten advanced CFL learners are the subjects of the research. Higher-level learners are required by the task in this study; on the other hand, the intermediate-level learners and advanced learners can help show whether there is any learning effect, and what are the persisting patterns of prosodic deviations. Ten native Mandarin speakers are the control group;

(3) Acoustic measurements: Syllable duration, F0 targets and mean F0 of each syllable will be measured. The F0 data will be converted to semitones to normalize the inter-speaker variability;

(4) Data analysis: qualitative & quantitative analyses

a. Intonational structuring:

- F0 contours of the same utterance produced by the L1 and L2 speakers will be compared to see whether there are deviations, and if so, what are the patterns;
- At the lower-level prosodic constituents, such as the prosodic phrase and the prosodic word, the focus is on the pitch resetting and domain-level F0 contours;
- The deviation patterns are discussed with respect to the particular tones in the prosodic constituent, and the speaker groups, to see whether they are English intonation transfer, or just developmental language-universals.

b. Temporal structuring:

- The values of syllable duration in the L1 and L2 utterances are statistically analyzed, focusing on the utterance-initial and utterance-final positions to see

¹ Xu (1994) finds that in a compatible context where adjacent tonal values agree, as in the sequence of T1 T4 T2, the deviation of tones from their canonical forms was relatively small, whereas in a conflicting context where adjacent tonal values disagree, as in the sequence of T1T2T3, the tonal deviation was much greater, sometimes even to the extent of changing the direction of a dynamic tone. As for the perception of coarticulated tones, the identification of tones in compatible context was highly accurate with or without the original context, whereas the identification of tones in the conflicting context remained accurate only when the tones were presented with the original tonal context, and without the original context, tonal identification dropped below chance. Xu argues that native listeners compensate for variations due to coarticulation better in compatible context than in conflicting context.

whether the lengthening effects are the same in L1 and L2 speech, and if not, what the deviation patterns are;

- The same analysis is repeated on the lower-level prosodic constituents, e.g., the intermediate phrase and the prosodic word, to examine the within-domain duration patterns (compression or lengthening).

c. Tonal production analysis:

- Tonal productions in the L2 speech are examined;
- The tonal productions by L2 learners are compared with those in the L1 speech to see whether the tones in L1 speech share the same patterns as those in L2 speech, and if not, what are error patterns in L2 speech? This step is of great importance, because tones in context are liable to deviating from the citation forms; thus merely referring to the citation forms of tones when judging the tonal productions is problematic;
- Explanations are made with reference to the L1 production patterns, the F0 contours in the prosodic constituents at different levels, and the specific tonal categories, and the L1 transfer or developmental universals.

Due to the difference in prosodic structure between English and Mandarin Chinese, coupled with the features of L2 speech (especially the slow speech rate), the prosodic phrasing in L2 Mandarin is likely to deviate from that in L1 Mandarin, namely the length and/or organization of prosodic constituents in L1 and L2 Mandarin might be different. Cao (2002) and Wang (2003) take the prosodic word as the fundamental building blocks for Mandarin rhythm; Cao (1999) argues that the prosodic phrase is the most frequent prosodic constituent in Mandarin. Kim (2006) suggests that the inter-stress interval (ISI) and the intermediate phrases are the phonological units that are most important to the prosody of American English. Even though the prosodic word and the prosodic phrase in Mandarin roughly correspond to the ISI and the intermediate phrase in American English, the specific organization of each prosodic constituent in each language is different. In addition, the prosodic phrasing usually goes hand in hand with the pitch resetting across the prosodic boundary, thus the difference in prosodic phrasing in L2 Mandarin will also influence the pitch pattern in an L2 utterance. Moreover, in an English utterance, not every syllable is accented; and the intermediate phrase is marked by the phrase accent, whereas the intonational phrase is marked by the boundary tone. Thus many syllables in an English utterance may not have any tone targets, whose F0 contours are merely the results of the interpolation of the phrase accent and the boundary tone. However, in Mandarin Chinese, each stressed syllable carries a tone, and most syllables in an utterance are stressed syllables, even though the intonation or other pragmatic functions may influence the actual realization of tones,

even to the extent that the tones are entirely overridden. Thus this difference between English and Mandarin might lead L2 Mandarin learners to unconsciously neutralize the tones of many syllables. In addition, pre-boundary lengthening often occurs at the prosodic boundaries. Thus, the different prosodic phrasing might lead to the different lengthening patterns in L1 and L2 speech, thereby creating different rhythmic patterns as well.

V. Implication of the study

The present study goes beyond the low-level tonal acquisition and attempts to examine the acquisition of prosody in a top-down manner, namely by examining the prosodic deviations from higher-level prosodic constituents to lower-level ones. Such a design would help tease potential confounding factors apart from each other and better explain the prosodic deviations in L2 speech. Also the findings of the study have important pedagogical implications, especially considering the fact that most studies merely examine the tonal acquisition without reference to the prosodic context/structure. It is expected that possible suggestions will be provided for the teaching of Mandarin prosody to CFL learners.

VI. Timeline

- 1) August, 2009 – October, 2009: stimuli construction;
- 2) November, 2009 – February, 2010: Data collection;
- 3) March, 2010 – August, 2010: Data analysis;
- 4) October, 2010 – November, 2010: Paper write-up;
- 5) November, 2010: Attend CLTA annual conference.
- 6) March, 2011: Attend 2011 AAAL conference (American Association of Applied Linguistics)

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