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Chun-Mei Chen

**Gestures as tone markers in multilingual communication**

**Abstract:** In this paper, the use of gestures in Chinese as a Second Language (CSL) classroom discourse was investigated to support the argument that visual cues exploited in multilingual contexts can be expressive and effective in language learning and communication. Traditional tonal pedagogy has adopted the numeric notational system introduced by Chao (1968). However, tonal values are such abstract numbers for language learners without tonal backgrounds that the effect of describing tonal numbers in CSL classrooms has been reported to be of dubious effectiveness. In the present study, 180 hours of two elementary-level CSL classrooms were videotaped to examine the role of gestures as tone markers in multilingual communication. The classroom discourse of 40 language learners from 12 countries was transcribed and was quantitatively and qualitatively analyzed. The results show that learners in the CSL classroom with gestural tone markers had significantly superior communication skills. It can be concluded that visual aspects of speech may play a role in language pedagogy and second language learning. Additionally, gesture has been found to be an integral component of language learning in multilingual contexts.

1 Introduction

Mandarin tones are always a challenge for first-year language learners, and tonal pedagogy is an inevitable task for language instructors. In Mandarin Chinese, meaningful lexical differences can be indicated by simply changing the fundamental frequency pattern of a given syllable. Non-tonal language learners will process foreign lexical tones with reference to their native prosodic categories, while tone language learners will process foreign tones with reference to their native tone categories (Ladd 1996). Both prosody and nonverbal communication are important components of language classroom interaction, but they are often overlooked in Chinese as a Second Language (CSL) research. Nonverbal behavior refers to any behavior that does not involve language (Kelman 1992). Languages have formal and explicit rules, and not every nonverbal behavior will lead to communication. Gestures, for example, tend to be treated as incidental rather than essential in face-to-face interaction. As McCafferty (1998) points out in his study, “gestures and other nonverbal forms of communication...
have been considered potentially important for some time, however, as yet, their connection to second language learning largely remains to be elucidated” (p. 94). Other researchers also consider nonverbal behavior to be highly culture-specific, as “nonverbal behavior is inherently ambiguous because it is highly dependent on context for its interpretation” (Fiksdal 1990: p. 47). In addition, “we do not realize that most of it [nonverbal behavior] is in fact learned and therefore specific to the cultural group in which it is found” (Wardaugh 1985: p. 79).

On the other hand, researchers who focus on face-to-face dialogue have long understood that some nonverbal behaviors are often used in conjunction with words, prosody, and each other in ordinary conversation (Bavelas et al. 1990; Früdlund 1991; Streick and Knapp 1992; Clark 1996; Jones and LeBaron 2002). Hurley (1992) explains the pedagogical motive for considering pragmatics, prosody, and nonverbal communication. Together, pragmatics, prosody, and nonverbal communication represent a substantial portion of the skills learners need to make the transition from classroom lessons to interaction with native speakers. Kelleman (1992) also found that body movement plays a significant role in communication both in encoding and decoding. In Lazaraton’s (2004) study, she examines the relationship between gesture and speech in vocabulary explanations. Her results suggest that gestures and other nonverbal behaviors are forms of input for learners that must be considered to be a salient factor in classroom-based second language acquisition research. The topic of nonverbal behavior in communication has received significantly more attention among researchers in response to these studies.

Gestures are not only movements. Certain researchers have adopted McNeill’s (1992) classificatory system, which indicates that gestures are not simply the arms moving in the air, but, rather, they are symbols that exhibit meaning in their own right (McNeill 1992). Following the principles of McNeill (1992), gestures occur only in speech. Hand movements that occur during face-to-face interaction include the following categories: iconic gestures, metaphoric gestures, deictic gestures, and beats. Iconic gestures are related to the semantic content of speech; metaphoric gestures may be pictographic or kinetographic, but they represent an abstract idea; deictic gestures have a pointing function, either actual or metaphorical; and beats are gestures that have the same form, regardless of the content to which they are linked. In a beat gesture, the hand moves with a rhythmic pulse that aligns with stress peaks in speech. Beats may serve a referential function, but their primary use is to regulate the flow of speech. In the present study, the use of gestures as tone markers is more similar to beats in Mandarin speech. The primary use of gestures in this study, however, is to facilitate the production and perception of Mandarin tones in classroom interaction.

There is a difference between a hand action and a hand gesture (Kendon 1985; Clark and Gerrig 1990). Hand actions have a practical function in the material world, such as, turning on a light switch or picking up a telephone. Hand gestures have a communicative function in the social world, such as telling someone to turn on the light. If social and communicative factors shape hand gestures, then these factors should likewise cause variations in gestures for the same referent (Özyirek 2000, 2002). Hand gestures serve both as symbols in communication and as part of verbal language usage. Because nonverbal acts are used in verbal language, they must be tightly synchronized with words in both timing and meaning (Bavelas and Chovil 2006). Speakers usually coordinate their hand gestures, and these gestures synchronize with parallel linguistic units (McNeill 1985). Timing is a meta-communicative tool that speakers use to signal that something is in the same integrated unit of meaning (Engle 2000). Gestures are connected to co-occurring speech (Bavelas and Chovil 2006) and have a split-second relationship to words (McNeill 1992).

Recent research also reveals that face-to-face dialogue is the most common form of language use in everyday life (Bavelas and Chovil 2006). Face-to-face dialogue is a collaborative activity (Clark 1996) with a high degree of reciprocity and mutual influence at a micro-social level. Within the setting of face-to-face dialogue, an essential criterion for nonverbal communication is its synchrony with words. In contrast, emblematic hand gestures are usually stereotypic and virtually independent of linguistic context. Although verbal and nonverbal messages are both present in the vast majority of instructional environments, it has been argued that they perform different functions in those environments (McCroskey et al. 2006b). Researchers assert that verbal messages stimulate primary cognitive meanings in receivers, whereas the nonverbal messages stimulate affective meanings in receivers. According to the argument of McCroskey et al. (2006a), nonverbal communication has a relational impact on student attitudes and feelings. Richmond et al. (2006) concludes that measuring the impact of nonverbal communication behaviors on students’ cognitive learning outside the carefully controlled experimental environment is notably difficult. Nonverbal communication in instruction has been used to insure effective learning.

Second language learners in a communicative class are active participants in their own learning process (Brown 2007). A language classroom with communicative language teaching is learner-centered and cooperative and collaborative learning is emphasized with a focus on students’ formal accuracy and fluency of production. Kinesthetic memory can be exploited for language pedagogy. Birdwhistell (1967, 1970) views body motion communication as a system that
can be described independently of the behavior of particular participants. He presumes body motion communication to be socially learned and communicative. Previous research with a "Total Physical Response" (TPR) technique has demonstrated that when adults learn listening comprehension, there is a highly significant difference in retention if the adults are in action at the time of learning (Asher 1965, 1966, 1967). Asher (1977) believes that language classes are often the locus of anxiety and proposes the TPR method to be a stress-free model. In a TPR classroom, students are expected to do a great deal of listening and acting before venturing verbal responses to questions. Simply using gestures, on the other hand, has also been found useful in language learning. Allen (1995) undertook an investigation of the effects of emblematic gestures on the development of French verbal expressions. One group was taught a set of gestures to help recall linked verbal expressions at a later time. Compared to other groups, the treatment group (with a set of gestures) showed greater recall of the verbal expressions and forgot significantly fewer sentences than did the other groups. McCafferty (2002) analyzed how gesture is linked to speech in creating zones of proximal development. He found that gestures are implicated in lexical comprehension, illustrations, environmental referents, and imitation. All of these studies have shed light on the role of gestures in second language learning. Most of the research on second language acquisition of Mandarin, however, concerns verbal input with little attention paid to nonverbal aspects of second language (L2) learners, let alone gestures in CSL learning. Little is known about how Mandarin tones are produced and perceived effectively in instructional contexts, particularly in multilingual classrooms with learners from different language backgrounds.

The focus of this paper lies in the intersection of emblematic hand gestures, specifically, gestures as tone markers, and the tonal achievements of second language learners in classroom-based face-to-face communication. The encoding design of hand gestures in the present study followed the phonological structure of Mandarin lexical tones in both timing and meaning (contour and direction of the pitch change). It has been found that addressees are more accurate at drawing figures when the speaker uses gestures (Graham and Argyle 1975). The typical encoding design varies as to whether the speaker has a visually available receipt. The basic principle for the design of hand gestures is that they contain an underlying unity. Gestures and speech are synchronous as well as pragmatically expressive (cf. McNeill 1992). Linguistic phonological knowledge is abstract, whereas gestures as tone markers are concrete and dynamic.

The purpose of the present study is to investigate whether visual cues exploited in multilingual contexts can be expressive and effective for language learning. Previous studies evaluating gestures in language learning have pro-vided some evidence as to how nonverbal form modifies verbal input and makes it easier to understand. Little is known about how Mandarin tonal categories are effectively explained and what nonverbal communication in the CSL classroom entails. A novel feature of this study is that gestures are embedded in classroom practice and considered to be one aspect of classroom discourse. This paper sets out to investigate the nonverbal behavior of language instructors and learners during classroom interaction by analyzing gestures and speech that the subjects employ in tonal pedagogy and practice. The research questions are formulated as follows:
1. What is the role of hand gestures (as tone markers) in classroom-based face-to-face discourse?
2. Does gesturing affect the tonal production and perception of learners in CSL classrooms?
3. What are the linguistic functions and pedagogical effects of gestures as tone markers in classroom practice?

2 Method
Data came from two first-year Chinese language (Elementary Chinese I and Elementary Chinese II) classrooms. Instructors were full-time Chinese teachers working in the Chinese Program. Learners came from different countries. The target language in the classrooms was Mandarin, and the languages used for communication among the learners were English and Mandarin. Some learners from the same countries also spoke their mother tongue in the classrooms. Videotaped data were collected during the fall semester in 2009 and the spring semester in 2010 consisting of 180 hours of classroom practices and interactions. The classes were divided into two groups: the control group and the experimental group. In the control group, Mandarin tones were taught mainly in the traditional five-scaled system. In the experimental group, hand gestures were used as tone markers in drills and classroom interaction. Recorded classroom discourse collected from both groups was analyzed to explore the effect of gesturing on the tonal production and perception of first-year learners.

2.1 Participants
Forty learners of Chinese as a second language from 12 countries participated in the study. None of the learners was of Chinese descent, and they had no background of Mandarin Chinese before they enrolled in the program. None of them
had a history of speech or hearing impairment. The number and the nationalities of the learners are illustrated in Table 1.

<table>
<thead>
<tr>
<th>Nationality</th>
<th>Number</th>
<th>Nationality</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>7</td>
<td>Korea</td>
<td>8</td>
</tr>
<tr>
<td>Australia</td>
<td>1</td>
<td>Thailand</td>
<td>7</td>
</tr>
<tr>
<td>South Africa</td>
<td>1</td>
<td>Vietnam</td>
<td>10</td>
</tr>
<tr>
<td>Germany</td>
<td>1</td>
<td>Poland</td>
<td>1</td>
</tr>
<tr>
<td>Ukraine</td>
<td>2</td>
<td>Indonesia</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 1: Nationalities of CSL Learners (N = 40)

Among the 40 participants, CSL learners from the U.S., Korea, Thailand, and Vietnam constituted the majority. There was a nearly equal ratio of male to female learners. In order to keep the analysis a manageable size, only data from American and Thai learners are considered in this study. Another reason for giving priority to American and Thai is the contrast of non-tonal and tonal experience in their native languages. CSL learners from the U.S. did not have any tonal experience, whereas learners from Thailand did.

Language instructors in both groups were in their late 30s and had at least 5 years of experience teaching Mandarin as a second language in college-level programs. Their tonal pedagogy in Elementary Chinese 1 was taped in its entirety. The subjects of the first fifteen hours of classroom time were Mandarin Pinyin, Zhuyin Fuhao and pronunciation. Tonal pedagogy was the major concern for the first month of the course.

2.2 Tonal pedagogy

There are four lexical tones in Mandarin Chinese, which are Tone 1, Tone 2, Tone 3 and Tone 4. The neutral tone is an atomic syllable. A tone is often described in terms of the pitch height and pitch shape it has over the duration of the syllable. The numeric notational system was first introduced by Chao (1968) as a systematic method of transcribing the phonetic pitch of tones. In Bao’s (1999) survey of tone theories, the “tonal values” of the categories differ from dialect to dialect. The term Mandarin is used here to mean the standard language, i.e., the target language in L2 classrooms.

Tonal categories in Mandarin are illustrated in (1). The numeric tonal value [5] indicates the highest level on the five-scaled system, whereas [1] indicates the lowest level (Chao 1968; Bao 1999; Yip 2002).

<table>
<thead>
<tr>
<th>Tonal Categories</th>
<th>Tonal value</th>
<th>Pitch Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tone 1 (yin ping)</td>
<td>55</td>
<td>high level</td>
</tr>
<tr>
<td>Tone 2 (yang ping)</td>
<td>35</td>
<td>high rising</td>
</tr>
<tr>
<td>Tone 3 (shang)</td>
<td>21 (4)</td>
<td>low falling-rising</td>
</tr>
<tr>
<td>Tone 4 (qu)</td>
<td>51</td>
<td>high falling</td>
</tr>
</tbody>
</table>

Tone 1, Tone 2, Tone 3 and Tone 4 have been described as “even”, “rising”, “falling-rising”, and “falling” respectively, or H, LH, L, and HL respectively in Yip’s (2002) transcription. The tonal values [212] and [211], however, are frequently uttered in speech for Tone 3 (Chao 1968), which indicates that the values of the four tones may not be reliable in spontaneous or naturally occurring speech.

Mandarin Tone 2 (T2) is a rising tone, whereas Tone 3 (T3) is a low (L) tone or a falling-rising tone. In Tone Sandhi contexts, T3 alternates with T2 when another T3 follows. In other words, the Third Tone Sandhi rule turns a T3 (low tone) into a rising tone when followed by another T3. Previous studies (Shih 1986; Chen 2000) provide phonological accounts of the Sandhi rule, and Chen (2000) further proposes stress-foot as Sandhi domain in diverse Chinese dialects. The Mandarin Third Tone Sandhi rule was treated as a dissimilation process on a register level (Yip 2002). When two syllables with identical tones come together, the first one changes its tone.

On the other hand, Mandarin tone markers adopted in contemporary textbooks are notably alike. Tone markers in Pinyin and Zhuyin Fuhao differ only with respect to neutral tone. There is no mark for a neutral tone in Pinyin but in Zhuyin Fuhao, one dot is displayed above the symbol. Students in Taiwan are taught Chinese with the aid of Zhuyin Fuhao, while those in Mainland China use Pinyin. Zhuyin Fuhao has visual logographic symbols, whereas Pinyin is an alphabetic system. The instructors in the present study taught their students both systems, but the learners chose either Pinyin or Zhuyin Fuhao in their written assignments.

In the present study, participants in the control group and the experimental group used the same textbook, Practical Audio-Visual Chinese (2008), which is one of the most popular CSL textbooks in Taiwan. The tonal markers in the textbook are illustrated in Figure 1. Both instructors taught their students Mandarin tonal categories during the first week of the course. They administered tonal drills and written assignments on Mandarin tones. It was necessary that all CSL learners be familiar with the tone markers in the early stage of learning.
neutral tone is light and short. The instructor also gave the tips on tonal pitch, as illustrated in (2).

(2) a. It is important to see where a tone starts and where it ends  
   b. By comparison, you can make the tones more accurately  
   c. Know the difference between a full third tone and a half third tone  
   d. When there are two third tones together, the first one is changed to the second tone

In the experimental group, conversely, the instructor used tonal contrasting, hand gestures, intensive drills, collaborative tasks, and indirect tonal error correction during the first week of the course. One example of tonal contrasting in the Experimental Group is illustrated in Figure 3.

During tonal pedagogy in the control group, the instructor added the following notes for the Mandarin tones: 1st tone (Tone 1) is high and level — singing; 2nd tone (Tone 2) is low to high — climbing; 3rd tone (Tone 3) is low and level — growling (half third tone only); 4th tone (Tone 4) is high to low — dropping;
Figure 4: Demonstration and practices of gesturing Tone 1 (left) and Tone 2 (right)

Figure 5: Demonstration and practices of gesturing Tone 3 (left) and Tone 4 (right)

demonstrated the gesturing of neutral tone as a dot above her head as illustrated in Figure 6.

The design of hand gestures assumes an underlying unity of gesture (McNeill 1992). The instructor demonstrated tonal gesturing with consistency and unity. After a few practices, the CSL learners in the classroom were familiar with the gestures as tone markers during their drills.

The instructor in the experimental group also reminded her students that gesturing tone markers was useful both in monosyllabic words and disyllabic words. Classroom drills included both. Figure 7 illustrates the practices of tonal gesturing in disyllabic vocabulary ʻTaiwán ʻTaiwanʻ.

It should be noted that learners of Chinese often use gestures and postures with tones. Some learners prefer making the gestures with their hands or fingers, while others prefer tilting their heads. In the present study, the students in the experimental group were encouraged to gesture with their hands during tonal drills or classroom activities to ensure that both the instructor and the classmates understood. Students who were answering with hand gestures often stood so that their gesturing was seen by the rest of the class, and particularly by the instructor in front of the classroom.

It is clear that gestures as tone markers have a communicative function in the CSL classroom as a component of giving answers or indicating understanding to the instructors. In this case, gestures as tone markers are tightly in sync.
with words in both timing and meaning. Gestures are synchronized with parallel linguistic units (McNeill 1985), and, in the CSL classroom, they are connected to co-occurring speech (cf. Bavelas and Chovil 2006).

The students were also taught that in trisyllabic words, longer phrases, or, in fast speech, gesturing might not be of great help. In Third Tone Sandhi contexts such as nǐ hào (‘how are you?’ nǐ hāo becomes nǐ hāo), students gave their answers according to the actual pronunciation. In written assignments, both the underlying tone (Tone 3) and the surface tone (Tone 2) were considered correct in the cases of Third Tone Sandhi, although the underlying tone (Tone 3) was represented in the textbook.

2.3 Data collection

One hundred eighty hours of two elementary CSL classrooms were video-taped so as to examine the role of gestures as tone markers in L2 learning and multilingual communication. Classroom discourse was transcribed, and tonal production and perception of the CSL learners were examined using both quantitative and qualitative methods. The instructors in the two groups gave permission to videotape and analyze the discourse in their classes. The CSL learners also consented to being videotaped.

Videotaped data were collected from two semesters of first-year Chinese language courses, fall semester of 2009 and spring semester of 2010. The audiotapes were transcribed by the author using conversation analysis (CA) conventions (cf. Atkinson and Heritage 1984). The number and frequency of correct responses of CSL learners in the two groups during tonal drills were counted and compared. The instructor in the experimental group employed a great deal of gestures as tone markers and other nonverbal communication in her classroom instruction. Only gestures as tone markers were analyzed in this study. Data from the first semester of the language course were the basis for the analysis because of a larger number of tonal drills in the CSL classrooms.

2.4 Tonal achievement ratings and measurements

In order to compare the effect of gestures as tone markers on the tonal achievement in the two groups of CSL classrooms, five experienced Mandarin instructors (not involved in teaching the two groups) were asked to rate the learners’ tonal accuracy. All instructors had at least five years of experience in teaching Mandarin as a second language in college-level language programs. The five Mandarin instructors were asked to watch 120 minutes of videotapes during the 10th week of the course and evaluate the American and Thai learners’ tonal accuracy. No gesturing occurred during the 120 minutes of videotapes. The Mandarin instructors did not know the difference in tonal pedagogy in the two groups. None of the Mandarin instructors had special training in speech. They were selected primarily on the basis of how they would rate their students’ tonal accuracy and what they would consider to be a tonal error.

The Mandarin teachers watched the videos individually but heard the pronunciation of the CSL learners via loudspeaker. Each Mandarin teacher participated in tonal achievement ratings on successive days if they could not finish watching within one day. They were asked to complete an evaluation form for each American and Thai learner. The median of the replicate ratings of each learner was determined for each instructor. If the students were given different ratings on different days, the scores were averaged.

The Mandarin instructors used a scale ranging from ‘poor tone’ (1) to ‘excellent tone’ (10) to rate the oral performance of the CSL learners. Both accuracy and fluency were taken into consideration when rating the students. Too many pauses and corrections would result in a lower score. Time for the completion of each accurate response was also counted in the ratings, as the Mandarin instructors could read the time on the screen. Videos could be replayed, but ratings could not be changed once given. The Mandarin instructors saw the learners prior to the ratings. They were informed of the codes (such as Subject 1, Subject 2, or Subject 3) of the learners and previewed the videotapes so as to recognize the learners during the rating process.

Acoustic measurements of the tonal tokens of the CSL learners were based on their pitch values, durations, and pitch range, using Praat and PitchWorks. Pauses and corrections in classroom discourse were also examined to evaluate the fluency of the language learners in L2 learning. In each assigned communication task, language fluency, accuracy, and the amount of time for completion were evaluated. Tonal productions, such as pitch range and prosodic features, and perceptions of Mandarin tones as evaluated by the Mandarin instructors in the two groups were compared. In this paper, gestures were taught in the language classroom, and acoustic measurements were made to verify the role of hand gestures in L2 tonal production. This study also aims to explore the correlation between phonetic features of Mandarin tones with gesturing and those without gesturing.

3 Results

The instructor in the experimental group used a variety of gestures while giving tonal explanations during the first and second lessons of the course. Next, CSL learners adopted these gestures as tone markers in their communication.
Sample (3) illustrates the use of gestures as tone markers in the classroom interaction.

(3) During class activities the instructor walked to Subject 1 and Subject 3.
   "...You have to pronounce the second word as the third tone, a falling-rising tone (with hand gestures)...."

1 Subject 1: Dui a!
   Correct PT
   ‘Right.’

2 Instructor: Dui bu dui?
   Correct not correct
   ‘Right.’

3 Subject 3: Wo bu zhidao
   I Neg know
   ‘I don’t know (I am not sure).’

4 Instructor: Na ni hui shuo ma ma?
   then you can say horse PT
   ‘Can you say the word “horse”?’

5 Subject 1: Dui.
   Correct

6 Ma shi di san sheng (with hand gestures)
   horse is the third tone
   ‘Right. The word “horse” is with the third tone.’ (with hand gestures)

7 Subject 3: (.5)

8 >Ma< (with hand gestures)
   ‘Horse.’ (with hand gestures)

As can been seen from (3), Subject 3 did not get the second word with the third tone correct on the first attempt. The instructor used hand gestures to remind the subject of the pitch contour of the third tone. With the help of the tonal gesturing of Subject 1, Subject 3 pronounced the third tone correctly with gestures when delivering the word ma ‘horse’.

Tonal gesturing also occurred in interactions between students from different countries in the experimental groups. Sample (4) illustrates gestures paralleling verbal communication between the learners in the CSL classroom.

(4) (American learner, Subject 6, gesturing to Subject 7 from Thailand)
   1 Subject 6: Ni hao
      ‘Hello.’

   2 Subject 7: Ni hao
      ‘Hello.’

   3 Subject 6: Ni hao ma?
      you good PT
      ‘How are you?’

   4 Subject 7: ni hao, >xie xie< (with gestures)
      ‘Hello, thank you.’ (with gestures)

   5 Subject 6: Ni jiao sheme mingzi
      you call what name
      ‘What’s your name?’

   6 (.5)

   7 >mingzi< (with gestures)
      name
      ‘Name?’ (with gestures)

Using hand gestures, learners from the U.S. and Thailand were more confident in delivering their questions and responses in classroom interactions. In sample (4), Subject 6 had already asked the question, “What’s your name?” However, he repeated the key word in the question using hand gesturing to insure that the recipient understood the question. Using this method, the recipient had a second form of communication with the subject. Even when Subject 6 failed to say the tones in the word mingzi ‘name’ correctly, the message still came across with hand gestures.

Sample (5) illustrates the combination of verbal communication and hand gesturing in the experimental group. In addition to gestures as tone markers, nonverbal communication was utilized in the CSL classroom.

(5) (The instructor asked Subject 6 to work with Subject 9, because Subject 9 did not yet know the name of Subject 6.)
   1 Subject 6: wo meiyou a (with gestures, waving hands)
      I no PT
      ‘I did not intend…’ (with gestures, waving hands)

   2 Subject 9: Oh, (laughter)

   3 Subject 6: … (laughter)
Gestures as tone markers facilitate the CSL learners' tonal production in face-to-face dialogue. For those learners not familiar with Mandarin tones in the early stages of the course, hand gestures gave them an outlet to rethink and correct what they said in the target language. Sample (6) illustrates how the CSL learners followed the gestures of the instructor with hesitation at first and later duplicated hand gesturing in their pair activities.

(6) (Subject 3 was assigned to finish a pair dialogue with Subject 4.)

1 Instructor: (to Subject 3) Ni shì wàng xiǎnshēng
   (with gestures)
   you are wang gentleman
   'You are Mr. Wang.' (with gestures)

2 Subject 3: ... (Silence)
   (Looking at Subject 4 and another classmate in front of her)

3 Subject 6: (1.5)

4 Wo shì... >wàng xiǎnshēng< ... >wàng xiǎnshēng<
   (with gestures)
   I am wang gentleman wàng gentleman
   'I am Mr. Wang... Mr. Wang.' (with gestures)

5 Subject 4: Wo zhídào, ni shì >wàng xiǎnshēng<
   (with gestures)
   I know you are wang gentleman
   'I know, you are Mr. Wang.' (with gestures)

Using gestures as tone markers in tonal error correction had some advantages in classroom instruction. Both the instructor and CSL learners never used the term bu dui 'incorrect' in the classroom after giving their answers of Mandarin tones. Those who did not get the correct tone modified their answers by changing their hand gestures. Both the instructor and the students waited until the other classmates finished gesturing. They gestured the correct answers to each other. With a few turns of practice, most of the learners produced the correct tones using gesturing. Corrective feedback at the initial stage of language learning could cause the students anxiety during classroom communication. Using gestures as tone markers in multilingual contexts may reduce this anxiety and reduce the number of verbal errors at the beginning stage of tonal learning. For instance, a learner can gesture a falling pitch contour to show that he understands a falling-tone visual or audio input, even if he cannot produce the correct verbal form of the falling tone. Using the silence strategy helped students avoid face-threatening but, on the other hand, hindered communication progress in second language learning. Some learners might avoid verbal expressions to prevent them from making errors. A student's consistent silence affects the overall pragmatic development of L2 learners because instructors ignore the lack of verbal response and misunderstand the learners' corrections. Using gestures as tone markers can serve as an alternative to silence or corrections in classroom communication.

Gestures can also be treated as visual cues and a part of effective learning strategies. When language learners actively participate in authentic and intentional classroom activities, and visual cues (gestures as tone markers) provide constructive and cooperative feedback, their classroom discourse shows the process of meaningful learning (cf. Jonassen et al. 2003). Integration of visual cues can bridge the gaps in multilingual communication among the first-year learners from different countries.

Quantitative analyses of the CSL classrooms, however, showed different frequencies of correct responses in the two groups. The experimental group's correct responses to the instructors' tonal queries between the fourth and the eighth week of the first semester course were analyzed, totaling approximately 3–4 hours of tonal drills per week. The numbers of correct responses were submitted to ANOVAs. The results showed that the simple variable of group (control and experimental) was significant (p < 0.05). The frequency of accurate responses within 15 hours of classroom interactions is illustrated in Table 2.

<table>
<thead>
<tr>
<th>Learners</th>
<th>American (N = 7)</th>
<th>Thai (N = 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>33%</td>
<td>67%</td>
</tr>
<tr>
<td>Experimental Group</td>
<td>59%</td>
<td>78%</td>
</tr>
<tr>
<td>Average</td>
<td>46%</td>
<td>73%</td>
</tr>
</tbody>
</table>

Table 2: Comparison of frequency of accurate responses in the two groups

As shown in Table 2, the frequency of accurate responses among both American and Thai learners in the experimental group is higher than that of the control group. The majority of first-year CSL learners using hand gesturing are more likely to give accurate responses, regardless of the tonal or non-tonal background of the learners. Although Thai learners show a higher frequency of correct responses than American learners within the same group, all learners in the experimental groups show consistently more correct responses than those in the control group.
To assess the students’ tonal achievements, the five Mandarin instructors watched the videotapes, heard the pronunciation of the CSL learners, and gave ratings for each learner (American and Thai). The Mandarin instructors used a scale ranging from 1 (poor) to 10 (excellent) to rate the oral performance of the CSL learners. Figure 8 shows the mean tonal achievement ratings obtained for the two groups as well as the ratings according to the background of the learners.

![Figure 8: Tonal achievements of American learners (left) and Thai learners (right)](image)

Figure 8 reveals several important differences. First, the learners in the experimental group have better tonal achievements than those in the control group. The experimental group’s higher ratings are consistent among the Mandarin instructors. Although Thai learners in both the control and experimental groups seemed to have better tonal achievements than American learners, Thai learners in the experimental group received even better tonal achievements ratings than those in the control group.

Acoustic measurements for the tonal production of the CSL learners included 1024 tokens (32 words × 8 subjects × twice × one turn with gesturing and one turn without gesturing = 1024) of monosyllabic Mandarin words. Voice tokens from four male (2 American learners and 2 Thai learners) and four female (2 American learners and 2 Thai learners) subjects aged 23–28 were collected for the measurements. All of the subjects were in the experimental group of the present study. The purpose of the acoustic measurements is to investigate the effect of hand gesturing on phonetic tonal production.

The recordings were taken at the 24th week of the first-year Mandarin Chinese course after the subjects had at least six months of Mandarin study. The word list consisted of 32 Chinese characters (even numbers for four tonal categories) with Hanyu Pinyin and tone markers. The experimenter (the author) demonstrated the hand gestures following the instructor’s encoding in the experimental group. The subjects were asked to pronounce the word list twice: the first time with hand gestures and the second time without using gesturing.

Each subject was individually recorded in a quiet classroom using a digital recorder with a microphone. Tokens from eight subjects were recorded and sampled at 22,050 Hz on the Praat and Pitch Works programs. Each word was repeated twice with about 3 seconds in between, allowing double measurements of the same word to be made. Multiple measurements of the same word were averaged. The pitch analysis range was modified to accommodate the pitch range for each speaker. The results were statistically analyzed by one-factor ANOVAs.

![Figure 9: Effect of gesturing on pitch range of eight CSL learners](image)

Figure 9 shows the pitch range among the eight subjects. The diamond represents the pitch range with gesturing, and the square represents the pitch range without gesturing among the subjects. Subject 1, Subject 2, Subject 3, and Subject 4 are American, while Subject 5, Subject 6, Subject 7, and Subject 8 are Thai. Most of the learners demonstrated a wider pitch range when producing Mandarin words with gesturing except Subject 5 and Subject 8. The widest pitch range was found in the tokens produced by Subject 1, who averaged 26 Hz. When the subjects produced the Mandarin words with gesturing, the final rising part of the third tone was attested more frequently. Although wider pitch range was found among six subjects, which indicates gesturing could affect the pitch range of the CSL learners, the effect of the gesturing is not statistically significant ($p > 0.05$; for instance, Subject 1: $F(1, 6) = 3.87$, $p = 0.054$).
Results from acoustic measurements show that gesturing could affect the representations of the CSL learners' tonal production, although the effect was not statistically significant. Together with the results of the frequency of accurate responses and the tonal achievement ratings, it appears that gesturing does affect the productions and perceptions of CSL learners in the experimental group. Compared with the oral performance of first-year learners from the U.S. and Thailand in the control group, hand gesturing positively affects the oral performance and classroom communication of CSL learners.

4 Discussion

Corrective feedback has generally been found to be beneficial in acquisition (Gass 1997; Gass and Selinker 2001; Gass 2003). Two major types of interactional feedback are recasts and elicitions, which have also been considered to be pedagogically useful strategies in communicative language classrooms (Doughty 2001; Doughty and Varela 1998; Gass 2003; Williams 2005). Recasts refer to feedback that reformulates a learner's non-target-like utterance into a target-like one (Nicholas et al. 2001). When an interlocutor reformulates a learner's error, the reformulation may draw the learner's attention to the target form by signaling to the learner that his or her utterance is deviant in some way (Long and Robinson 1998). Recasts may also provide learners with opportunities for modified output, which, as has been suggested, is crucial for L2 development (Doughty 2001; Swain 1995, 2005; Nassaji 2009). Elicitations, on the other hand, refer to feedback that does not correctly reformulate the learner's error, but rather encourages the learner to reformulate it (Loewen and Philp 2006; Lyster 2004; Nassaji 2007). Elicitation strategies include self-correction, prompting and providing learners with opportunities to test and revise their hypotheses about the target language (Lyster 2002, 2004; Lyster and Ranta 1997). Elicitations also provide opportunities for negotiation of form through various types of requests for clarification and correction (Lyster and Ranta 1997; Lyster 1998). Using gestures as tone markers in multilingual contexts provided opportunities for the CSL learners to recast their tonal output and self-correct their own tonal production.

The use of gestures as tone markers could serve as a nonverbal alternative to tonal corrective feedback. Direct correction made by the instructors does not yield long-lasting results. Nonverbal corrective feedback has been shown to be more effective than providing the correct verbal answer. Gestures are a type of corrective feedback in classroom activities that prevent the learners' potential embarrassment. It is widely agreed that the best person to correct an error is the person who makes the error. Manipulating gestures as tone markers to guide the learners to make self-correction or peer-correction is an effective method.

Another explanation for the success of hand gesturing in the experimental group is possible. In second-language contexts, gesture may partly compensate for difficulties with the verbal channel (cf. Gullberg 1998). Both CSL learners with and without tonal backgrounds could find themselves in a situation in which Mandarin is the only common language between themselves, the instructor and most of their classmates. In this case, gestures as tone markers can insure the comprehension of the instructor and the recipients in the classroom interaction. A message may be understood not because of the oral production of the learners, but rather because of their hand gesturing.

In response to the research questions proposed at the beginning of this paper, the role of hand gestures as tone markers in face-to-face classroom discourse is clearly not only for movement. Gestures as tone markers are symbols that exhibit meaning in their own right (McNeill 1992) and occur only during speech in classroom interaction. Hand gestures as tone markers are more similar to beats in Mandarin speech, and the primary use of gestures is to facilitate the production and perception of Mandarin tones in face-to-face classroom interaction. Gesturing does affect the productions and perceptions of CSL learners in the experimental group. In fact, gestures increased the accuracy rate of first-year learners in their oral performance, and gestures can be used as politeness strategies in tonal error correction. Gestures as tone markers can also have communicative functions in CSL classrooms. When unsure of a response, learners can check other classmates' gestures.

In the perception of Mandarin tones, pitch is a robust cue. Perception of pitch height is dependent on adjacent tones rather than absolute pitch values. Many of the tonal errors produced by American CSL learners are due to the misplacement of the pitch range. It is crucial for CSL learners to acquire the pitch contour (pitch values at onset and offset) of each Mandarin tone. Pitch contour of Mandarin tones can be visualized using hand gesturing. The frequency of accurate responses among American learners in the experimental group (with hand gesturing) is higher than that of the control group (without hand gesturing), and the same pattern can be found among the Thai learners. Although Thai learners have shown more accurate responses than American learners within the same group, learners in the experimental groups have shown consistently more correct responses than those in the control group. In the tonal achievement ratings of the CSL learners, both accuracy and fluency were taken into consideration. Overt pauses and corrections reduced the fluency rating of the oral performance, whereas the misplacement of pitch range and pitch contour would result in a tonal error.
A wider pitch range was demonstrated when speakers produced Mandarin words with gestures, which indicates gesturing could affect the pitch range of the CSL learners, although the effect of gesturing is not statistically significant. The findings reported in the present study indicate the unavoidable gap between experimental research and classroom pedagogy. While the effect of gesturing was verified in the ratings of the experienced Mandarin instructors and the frequency of accurate responses in classroom activities, gesturing was not shown to be statistically significant in the acoustic measurements.

From a pedagogical standpoint, gestures as tone markers did, in fact, increase the production accuracy of first-year learners in CSL classroom; however, gestures have their own restrictions. Gestures as tone markers must synchronize with parallel linguistic units in timing to make sense in classroom drills. Gestures are also symbols that exhibit prosodic meanings in their own right. In classroom practices, gestures exaggerate the tonal pitch direction of single words, but they may not be practical in fast speech flow. Tonal gestures often form messages with the words they accompany. In the present study, gestures proposed in the experimental group incorporate the visual phonological structure of Mandarin tones and act as communication cues in classroom discourse in multilingual contexts.

The other limitation of this study concerns the effectiveness of the gestures themselves on students' tonal improvement. In the current study, it is possible that the experimental group that used hand gesturing made more of an emphasis on the tonal aspect of the language. It could be merely the matter of emphasis or focus that makes the difference. A further study over time in which both teachers use the experimental and control methods with different groups of students might address this issue. In addition, the current study focuses mainly on the effectiveness of gesturing in language pedagogy and learning. It is clear that Mandarin tones may be effectively taught and learned using gestures. Future studies should also explore the effectiveness of these gestures on the learners' communication with each other.

5 Conclusion

In this study, the use of gestures in classroom discourse was investigated to support the argument that the visual cues exploited in multilingual contexts can be effective for language learning. One hundred eighty hours of videotaped data were drawn from two CSL classrooms to examine the role of gestures as tone markers in multilingual communication. Classroom discourse of 40 language learners from 12 countries were transcribed and then quantitatively and qualitatively analyzed. One language instructor proposed five types of gestures as tone markers in the first week of the course and manipulated the gestures throughout, whereas the other language instructor adopted the traditional tone graph as proposed by Chao (1968) without the use of gestures in classroom drills. The shapes of the written tone markers in Mandarin Chinese basically follow the pitch contour of the isolated Mandarin tones. However, tonal values are such abstract numbers for language learners without tonal backgrounds that the effect of describing tonal numbers in CSL classrooms has been reported to be of dubious effectiveness.

In the present study, hand gestures followed the phonological structure of Mandarin lexical tones. In the experimental group, hand gestures were used as tone markers both in drills and classroom interaction. The basic principle for the design of hand gestures is that they must have an underlying unity (McNeill 1992). The instructor demonstrated the tonal gesturing with consistency and unity. Pauses and corrections in the classroom discourse were examined to evaluate the fluency of the language learners in multilingual communication. In each assigned communication task, language fluency, accuracy, and time to completion were evaluated.

The results have shown that the learners in the CSL classroom with gestural tone markers had significantly better communication achievements, including better tonal production and a higher frequency of accurate responses. Gesture has been proven to be an integral component of the language learning process in multilingual contexts. Visual aspects of speech may play a role in language pedagogy and second language learning.

It can be concluded that nonverbal acts serve an intrinsic role in language learning used in face-to-face discourse. Kinesthetic memory can be exploited in language pedagogy, and this study adds to the preexisting pool of evidence. The awareness of conversational hand gestures as analogically encoded symbolic acts is not redundant when used with the verbal words, but rather tonal gestures often form messages along with the words they accompany. Linguistic phonological knowledge is abstract, whereas gestures as tone markers are concrete. Gestures as tone markers must be tightly synchronized with the timing and meaning of words and with parallel linguistic units (McNeill 1985). Gestures as tone markers in the CSL classroom are connected to co-occurring speech. Gestures in this context are the visual phonological structure of Mandarin tones in CSL classrooms and act as communication cues in multilingual classroom discourse.

Finally, it was noted that gestures as tone markers have their own limitations. As pointed out by the instructor in the experimental group, gesturing tone markers was useful in monosyllabic words and disyllabic words. In tri-syllabic words or longer phrases or even in fast speech, however, gesturing
might not be as effective. Gestures as tone markers could be extremely useful in first-year, especially first-semester, CSL classrooms. As CSL learners begin to improve and display their fluency in Mandarin speech, the use of gestures as tone markers could gradually be lessened.

References


Gestures as tone markers in multilingual communication


Ying Liu

The collaborative construction of cultural knowledge in a Chinese movie class

Abstract: With the recent development in second and foreign language education, the relationship between context and language has drawn keen attention from a growing number of L2 education researchers. While most researchers focus their attention on the effects of local contexts on teaching and learning, the construction of target culture context still requires further research. The goal of this study is to investigate how classroom activities help students at the L2 level acquire and share cultural knowledge that allows them to form a context for new conversations and activities in their L2 environment. I will begin by reviewing some definitions of ‘culture’ and ‘context’. Then, later in the paper, I will examine the process by which target culture contexts are constructed in a second year Chinese film class based on observational data. Finally, I will discuss related pedagogical implications.

1 Introduction

1.1 Language in context

The relationship between language and its context has been explored extensively by researchers. Wittgenstein (1978) conceptualized language as games embedded in broader patterns of actions, whereby the meaning of a word or a sentence is determined by people’s use of language within specific contexts rather than by the word or sentence itself. In order to contrast the language in real life communication with abstract “sentences belonged to nobody,” Bakhtin (1986: 83) used the term “utterance,” which is “framed and delimited by a change of speech subjects” and directly reflects an extraverted reality. Bakhtin argued that there were two essential aspects of utterance: addressivity of the utterance and the influence of the anticipated response. According to Bakhtin, any participant in a conversation must consider not only his/her relationship with the addressee, but also the addressee’s background and possible reactions to what has been said. The grammar rules provide people with scaffolding upon which to build their conversations, but the actual interaction must be based on a comprehensive knowledge of the addressee, which is part of the conversational context. Another aspect of this context lies in the dialogical echoes from others’