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## **The Sociocultural-Cognitive Underpinnings in Error Correction: A Descriptive Study on Acquisition of Chinese Tones**

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### **Abstract**

This study investigates how teachers can best assist students of Chinese as a foreign language (CFL) in acquiring Chinese tones in the classroom by analyzing: (a) the differences between students' tonal errors in classroom interaction and in reading sentences aloud; (b) the types of teachers' error treatments; (c) the relationship between students' tonal errors and their perspectives on error corrections; (d) the relationship between teachers' error corrections in classrooms and their perspectives on tonal errors and corrective feedback. The data sources included audio recordings of 15 hours of classroom visits to 5 teachers' first-year classes, 2 hours of 26 students' performance on a tonal achievement oral test, and teachers' and students' surveys. Results indicate that the degree of attention to speech in different settings causes variations in tonal error patterns. Students who preferred self-correction made fewer tonal errors in the reading aloud tests. Among all linguistic explanations, describing the pitch contour of tones was the least preferred error treatment strategy for the teachers and students. Simply asking students to repeat teachers' model of appropriate tones without any additional guidance constituted the least effective but most frequently used corrective strategy. The teachers also often ignored tonal errors and expected students to overcome their problems by memorizing Chinese tones. In agreement with the Vygotskian perspective that perceives the nature of error correction as a collaborative activity, the findings show that successful error corrections require teachers and students to co-construct the linguistic knowledge and transition from external corrective interaction to students' self-assistance. Based on these findings, it suggested how teachers can strategically correct tonal errors.

### **Keywords**

Corrective feedback, error correction, Chinese tones, sociocultural theories, scaffolding strategies

## **1 Introduction**

In the field of second language acquisition (SLA), error treatment, error correction, and corrective feedback are used interchangeably. Error treatment was first defined as the way teachers respond to learners' linguistic errors in learning a second language (L2) (Allwright, et al., 1991; Craig, 1977;

Ellis, 1994). With the development of SLA research, Ellis (2007) further specified that error correction (EC) is a technique to help learners correct errors by providing them with prompting, and corrective feedback (CF) takes the form of responses to L2 spoken or written production containing an error. Sheen and Ellis (2011) stated that CF refers to the feedback that learners receive on the linguistic errors they make in their oral or written production in an L2. Although CF currently is the more popular term adopted by most researchers, I will use EC and CF interchangeably to reflect the original terminology used in the literature.

The effects of CF in L2 development have been studied and discussed from cognitive and sociocultural perspectives. From cognitive perspectives, numerous studies focused on whether CF contributes to L2 learning and what type of CF is most effective (e.g., Bitchener & Knoch, 2008; Ellis, Loewen, & Erlam, 2006; Ferris, 2002; Jiang & Chen, 2013; Lyster, 2004; Van Beuningen, de Jong, & Kuiken, 2012). CF is perceived as a trigger to activate learners' noticing of non-target-like output based on cognitive perspectives, in the process teachers provide students with linguistic information and opportunities to modify their own errors (Gass, 1997; Long, 1996). Through the analysis of students' test scores, researchers can conclude which type of CF is effective or not. Note that these studies link CF to student outcomes by measuring the students' end-performance and not by the individual factors that may contribute to a students' success or failure while learning a foreign language. That is, the process of corrective interaction, which is constructed by teachers and students collaboratively, is largely ignored. This process, nevertheless, can potentially reveal real, causal, and dynamic relationships of developmental changes in sociocultural settings. Only by viewing the relationship between teachers and students within a social context can we see a clear picture of how the language taught is used by students. More researchers, therefore, have attempted to explore the role of CF in L2 acquisition from the lens of sociocultural theories (SCT). Under SCT, CF is seen as a way to offer learners dialogically negotiated assistance, as they move from other-regulation towards self-regulation (Aljaafresh & Lantolf, 1994; Erlam, Ellis, & Batstone, 2013; Nassaji & Swain, 2000; Rassaei, 2014). However, most studies of CF so far have focused on English as a Second Language (ESL) writing.

There is a pressing need for CF research to be extended to other less commonly taught languages and be applied to different linguistic domains, to meet a broader range of pedagogical needs. Thus, this study investigates the CF in Chinese tonal acquisition, which attempts to make learners aware that they have produced a tonal error immediately following the error occurrence and to help them correct it. Chinese was listed in-group IV as one of the most difficult languages to master by the Foreign Service Institute (1973) (see discussion in Liskin-Gasparro 1982; Omaggio, 1988; Rivers, 1992). Among the commonly identified areas of difficulties associated with learning the Chinese language such as pronunciation, writing system, and grammar, learning the Chinese tonal system can be the most challenging one for beginners whose first language is not a tonal language. In comparison to an intonational language like English, Chinese as a lexical tonal language uses pitch variation in each syllable to differentiate meanings of words. There are four major tones for determining lexical meanings. In other words, every morpheme in a Chinese word has a tone contour shifting from one pitch to another over the course of the syllable, and mispronunciation of such would affect comprehension of the word's meaning. When a tone changes, a different meaning is potentially produced for the same morpheme. For example, *tang* pronounced with a high-level pitch tone means "soup," but with a pitch falling rapidly from high to low means "hot." To native speakers of Chinese, incorrect pronunciation of a tone often cannot be treated merely as a foreigner's accent but likely causes confusion and miscommunication. Learning to pronounce tones accurately, therefore, has been the fundamental step that leads to successful verbal communication in CFL.

## 2 Literature Review

Analyses of types of tonal errors and explanations of the causes have received considerable attention in

CFL research (e.g., Lu, 1992; McGinnis, 1996; Miracle, 1989; Shen, 1989; Wang, 1995; White, 1981). Some studies target tonal perception training with computer programs, graphical cues, gestures, or automated drills to improve students' learning of tones (e.g., Eng, Hannah, Leong, & Wang, 2013; Liu et al., 2011; Morett & Chang, 2015; Wang, 2013; Wang et al., 1999). Research, however, has shown that improvement of tonal perception may not always correlate significantly with the tonal production (Lu, 1992). It is important for Chinese tonal studies to exam how CF can contribute to tonal development.

To the best of my knowledge, there is only one study focusing on providing tonal EC by a computer program. Peabody and Seneff (2006) explored the possibility of providing EC by using students' own voices to alter their tonal errors through computer transformation techniques. They compare native pronunciations of tones with their incorrect tones and then listen to a waveform of their utterances, which was modified and matched to native speakers' correct models, so that they can imitate their own voice. This study intended to help learners through a computer-aided learning program when teachers are not available, but it is not applicable to classroom teaching and learning. Therefore, some pedagogical questions remain unanswered today. For instance, how do teachers assist students in learning tones through CF? How do learners participate in corrective interactions with their teachers to improve their tonal performance? This study, therefore, will explore these crucial questions from the lens of cognitive and sociocultural perspectives, given that both theories view CF as a major contribution to L2 acquisition.

## 2.1 Cognitive theories

According to Sheen and Ellis (2011), CF helps L2 acquisition when the learners focus primarily on meaning. The CF they receive after committing errors helps them recognize or notice the correct linguistic form in a meaningful context. There are three influential hypotheses of CF proposed based on cognitive theories (CT): The Interaction Hypothesis (Long, 1996), the Output Hypothesis (Swain, 1985, 1995), and the Noticing Hypothesis (Schmidt, 2001). Sheen and Ellis (2011) explained and exemplified these three hypotheses: (1) Interaction Hypothesis: The negotiation of meaning occurs when a communication problem arises, resulting in interactional modifications that provide learners with the input needed for L2 learning. (2) Output Hypothesis: Learners learn from their own output when they need to stretch their interlanguage to meet communicative goals. (3) Noticing Hypothesis: L2 learning is enhanced when learners pay conscious attention to specific linguistic forms in the input to which they are exposed.

All three CT emphasize that CF can contribute to language development, because it occurs during communicative interaction between interlocutors, which enhances awareness of the meaning of the target form in its context and facilitates the uptake and incorporation of the correct target language forms (Althobaiti, 2014). Chandler (2003) found that CF has a positive impact on language accuracy and complexity but did not find any significant change in learners' language complexity over time in his study. Van Beuningen et al. (2012) showed that CF leads to improved accuracy but does not result in improved structural complexity and lexical diversity in students' new writing. As many CF studies supported the idea of the positive effects of CF on language accuracy but failed to reach a unanimous conclusion within a cognitive framework, more researchers thus begin to turn their attention to defining different types of CF and to find which CF method is more effective in L2 development (Chen et al., 2016). Sociocultural perspectives, by contrast, perceive CF as a means to transform learners from other-regulation to self-regulation.

## 2.2 Sociocultural theories

SCT were established by Vygotsky (1978). He describes the relationship between learning and development as one in which the former "awakens a variety of internal developmental processes that

are able to operate only when the child is interacting with people in his environment and in cooperation with his peers” (p. 90). In SCT, more than just providing correct linguistic forms, CF is a form of joint participation of social interaction or negotiation between the learner and the teacher. Such social interaction is constructed or tailored to the learner’s developmental level, which Vygotsky (1978) captured as the Zone of Proximal Development (ZPD) where learning and development occur. The ZPD enables an individual to experience success in doing things that they cannot otherwise do alone (Lantolf, 2011). However, there is no single type of social interaction that fits all learners, because a successful Vygotsky’s social interaction must be able to assist an individual learner in moving from other-regulation (including scaffolded CF) to self-regulation where the learner can successfully do things independently (Sheen & Ellis, 2011). Scaffolded CF refers to a collaborative process that initially requires learners to use their interlanguage knowledge to correct their own errors, which is implicit CF. If that effort fails, the teacher provides some scaffoldings by offering more explicit CF progressively. Cazden (1994) noted that “scaffolds are temporary, adjustable frameworks for reconstruction in progress; their metaphorical sense retains the important Vygotskian meaning of an ever-shifting ZPD.” In other words, CF must be adjusted to the learner’s needs and provided in the learner’s ZPD, which is individualized and constantly modified, so that the learner gradually can use a linguistic feature correctly and independently.

The concept of scaffolding was first created by Wood, Bruner, and Ross (1976) to explore the different interaction relationship between a learner and a tutor in problem solving. The scaffolding consisted of six different instructional activities: (1) Recruitment of learner’s interest and concentration; (2) Reducing degrees of freedom in a task to the level that the learner can manage, and reducing the level of instruction when the learner improves; (3) Keeping the learner’s attention and motivation on the task and ultimate goal (each task may have several steps and goals that the learner may adhere to), which is called direction maintains; (4) Marking critical features of a task and discrepancies between what the learner produces and what is correct; (5) Frustration control of the learner; and (6) Demonstration or “modelling” of solutions of the task of a solution which has been partially solved by the learner.

An early study in SCT framework by Aljaafreh and Lantolf (1994) investigated how a tutor’s interventions helped three ESL learners use the language structures independently with more implicit CF than explicit CF. Their study demonstrated that the learners gradually depended less on assistance provided by others and more on self-regulation, suggesting evidence of language development. They also identified three general principles governing the effectiveness of CF: (1) It must be graduated—no more help than is necessary should be provided at any single time; (2) It must be contingent—it must reflect the actual need and be removed when the learner demonstrates the ability to function independently; and (3) It is dialogic—it involves dynamic assessment of a learner’s ZPD (see also Otha, 2017). Drawing from these principles, Nassaji and Swain (2000) explored the effectiveness of CF within learners’ ZPD versus random CF on learning English articles. They showed that the CF provided in learners’ ZPD helped two Korean ESL learners to become self-regulated in correction procedures, while the random CF did not. Lavasani (2010) also examined the role of CF in ZPD and explored the effectiveness of gradual CF, from an implicit CF to an explicit one, on the linguistic accuracy of ESL learners’ writing and explored the progression of CF from teacher- to learner-regulation within the learners’ ZPD. He reported that the total number of errors that learners made in the final writing decreased to half in comparison to their initial writing. Rassaei (2014) compared the scaffolded CF and recast CF. He reported that properties of negotiation and tuning situated in scaffolded CF contributed to higher levels of language development than recast CF. In the same vein, Saeb et al. (2016) studied the efficacy of scaffolded CF and recasts in improving ESL learners’ performance on using the third person singular “-s” morpheme for verbs. The scaffolded CF was provided within a sociocultural framework as a collaborative process, in which learners were given assistance adjusted to their individual needs. Recast CF, on the other hand, was used as reformulations of learners’ erroneous utterances without the error. Consistent with previous studies (Aljaafreh & Lantolf, 1994; Nassaji & Swain, 2000; Rassaei, 2014; Saeb et al., 2016), scaffolded CF proved to be more effective than the more implicit recast CF. Although the findings of CF

studies based on SCT perspectives seem to be more encouraging, most of the studies focused on ESL writing with a small number of participants, which consequently cannot lead to a generalization for L2 development across different L2s.

Recently, more researchers have advocated integrating SCT with CT to understand L2 teaching and learning (e.g., Achard & Niemeier, 2004; Boers & Lindstromberg, 2008; De Knop & De Rycker, 2008; Pütz et al., 2001; Robinson & Ellis, 2008). Lantolf (2011) pointed out that the integration of SCT and CT can enhance L2 pedagogy, because both theories recognize that meaning comes from socially organized communication or mediation activities, which leads to mental or linguistic development. Althobaiti (2014) added that CF is the bridge between cognitive and sociocultural perspectives, because both believe that CF must be provided through communicative interaction, which leads to language learning and development. This study therefore attempts to explore the value of CF in the L2 development of Chinese tones through both lenses.

### 3 Methodology

To describe how Chinese tonal acquisition emerges and develops during the corrective interaction and how teachers assist students to learn Chinese tones through EC in classrooms, a case-study approach was adopted as the primary research methodology, which incorporated elements of ethnographic research and protocols. Specifically, this study attempts to answer four questions:

1. What are the types of tonal errors that students make? Are there general patterns to these errors? If such patterns can be identified, are they different from the findings in previous studies?
2. How do CFL students perceive their teachers' EC in classrooms? And what is the relationship between their perspective of EC and their tonal performance in a tonal achievement test?
3. What are the types of EC that teachers use in assisting students' acquisition of tones in elementary CFL classes? And what is the relationship between teachers' actual corrections of tonal errors and their perspective on them?
4. How is EC collaboratively conducted by teachers and students during social interaction? Do teachers employ scaffoldings in assisting learning of tones? If so, what scaffolding strategies do they use?

#### 3.1 Participants

CFL teachers generally introduce Chinese pronunciation and tones during the initial weeks of the first semester, and beginning students receive intensive training on both throughout first semester. This study was conducted with five beginning CFL classes from two rigorous summer programs at two different universities in the United States. Twenty-six students who were English speakers and had no prior knowledge of Chinese participated in the study, including 14 male and 12 female students. The study also included five instructors who taught those classes, with four female Chinese native speakers and one male English native speaker who was a Superior level of Chinese speaker. There were four hours of instruction and one hour of an individual conference with the teacher offered each day in both programs, resulting in 25 hours of interaction between teachers and students per week.

#### 3.2 Procedures

##### 3.2.1 Class visits

Each of the five classes was audio-taped for one hour every three weeks during the nine-week program,

producing a total of 15 hours of audiotapes. The audiotapes were transcribed to identify the following information: (1) Types and frequencies of tonal errors (see Table 1); (2) Types of teachers' EC (see Table 4); (3) How EC was conducted by teachers and students collaboratively during social interaction; (4) How students responded to the teachers' EC during corrective interaction.

### *3.2.2 Tonal achievement test*

A tonal achievement test was administered during the last week of the programs. The students read 15 Chinese sentences aloud, and their performance was audio-taped. Although the formal reading aloud test may have inhibited natural speaking, the selected sentences were aligned with natural utterances with meaningful content and had three advantages: (1) The tonal errors were elicited from the same linguistic context to control the length of the test, the degree of difficulty, and the mixture of tones; (2) It helped avoid students' imitation of an immediate auditory model from teachers or other students; (3) The speech samples obtained from all students were similar and therefore comparable, because they were unable to use strategies of avoidance during their test.

In addition, the tonal achievement test was prepared based on the following principles:

1. Following Shen (1989), the sentences were selected from the lessons learned and presented with Chinese characters, Pinyin with tone marks, and English translations. The design was to prevent students from diverting their attention from tones due to unfamiliar words or characters.
2. The four Chinese tones occurred equally in the test, so the number of errors would not be affected by the unequal distribution of certain tones. However, the test contained a lower occurrence rate of neutral tones, as compared to the other four tones in the language.
3. All possible tonal combinations of Chinese were presented in the test to cover all Chinese tone rules. For example, a character may lose its original tone and turn into a neutral tone, when it occurs as a suffix or grammatical morpheme, or a tone may change its pitch contour when followed by another particular tone (i.e., tone sandhi).

### *3.2.3 Questionnaires*

The students' questionnaire, adapted from Chaudron (1988), had ten statements with each presenting a different EC (see Table 3). The students were asked to rate each statement according to their own opinion. They rated each EC statement using a four-point Likert scale, with 1 given to "strongly disagree," 2 given to "disagree," 3 to "agree," and 4 to "strongly agree."

The teachers' questionnaire was (see Table 5) adapted from Chaudron (1988), Fanselow (1977), and Carroll and Swain (1993). The teachers were asked to rate four questions about students' tonal errors followed by several pedagogical solutions. The teachers were asked to rate each solution using the same four-point Likert scale used in the students' survey.

### *3.2.4 Data collection and treatment*

Two experienced Chinese teachers coded the audiotapes and transcriptions separately. Both were native speakers and had been teaching CFL over ten years in American universities, and neither of them was the instructor of the classes visited in the present study. They first examined some sample tapes together and discussed the various tonal errors and EC types. They then came to an agreement on the sorting criteria. For example, (1) whether a tonal production can be identified as one of the Chinese tones, and (2) whether it is the production of the tone that the teacher expected or that the student intended to produce. If a tone was judged to be one of the Chinese tones as well as the one that teacher expected, the rater wrote down the tone number on the evaluation sheet. If a tone was judged to be one of the Chinese tones

but was not the one that the teacher expected, the rater wrote down the judged tone number and marked it as an incorrect tone. If a tone could not be identified as a Chinese tone, the rater only marked it incorrect. This procedure was also applied to the evaluation of the tonal achievement test. Finally, the percentage of the inter-rater agreement on tonal errors that occurred in class visits was 89.16%, and 91.6% on the tonal achievement test.

Evaluation of the types of teachers' EC (see Table 4) was based on the Descriptive Model of Discourse in the Corrective Treatment of Learners' Errors by Chaudron (1988), the Types of Treatment of Errors by Fanselow (1977), and Explicit and Implicit Negative Feedback by Carroll and Swain (1993). For example, explicit EC refers to cases where a teacher overtly stated that a student's tonal production was wrong with a description of the correction technique (i.e., requesting repetition from the student, providing metalinguistic information, or negating student's response). Implicit EC, by contrast, took place when a teacher waited for a student to correct oneself by implying that her response was unintelligible or repeating the teacher's original question, and so on.

## 4 Results

This section will first discuss the results of quantitative analyses and then qualitatively analyze the social interaction during EC following the discourse analysis protocols suggested by Aljaafreh and Lantolf (1994).

### 4.1 Analysis of quantitative data

#### 4.1.1 Tonal errors in classrooms

The first research question asked about the types and patterns of tonal errors. Table 1 presents the types and mean frequencies of tonal errors that occurred during the 15 hours of class visits. The mean tonal errors for ten tone pairs were based upon all cases in which one of the tones was mispronounced in the pair. For example, the mean of the pair "T4-3" indicated all instances in which the student either produced a Tone 3 as Tone 4 or a Tone 4 as Tone 3. Thus, errors shown in "T4-3" indicate that students may have difficulties differentiating these two tones. The percentage indicates what percentage of a certain tonal error is accounted for in the total number of tonal errors. For example, errors of T4-3 constituted 25% of the total number of tonal errors.

Table 1

*Types and Mean Frequencies of Tonal Errors in Class*

Type	Class 1	Class 2	Class 3	Class 4	Class 5	Mean	%
T4-3	145	113	145	35	37	95	25%
T3-1	54	96	121	32	22	65	17.4%
T4-1	81	57	90	21	56	61	16.3%
T3-2	54	79	116	21	29	59.8	16%
T2-1	43	58	77	29	23	46	12.3%
T4-2	63	26	65	24	24	40.4	10.8%
N-T1	1	3	10	1	2	3.4	0.9%
N-T2	1	1	4	2	1	1.8	0.5%
N-T3	0	2	2	0	0	0.8	0.2%
N-T4	0	5	5	0	0	2	0.5%
Total	442	440	635	158	194	375.2	100%

Notes. 1. T3-2 = Tone 3 and Tone 2; N-T1 = Neutral tone and Tone 1

2. % indicates the percentage distribution out of the total number of tonal errors.

As shown in Table 1, Classes 4 and 5 produced fewer errors than did the others. The differences of error production among classes might have resulted from factors such as different teaching approaches, varying content of the classes, or students' individualities. Overall, the beginning CFL students had the most frequent errors with the pair of T4-3. The tonal errors with T3-1, T4-1, and T3-2 were more frequent than those with T2-1 and T4-2. The errors with the neutral tone were comparatively few.

#### 4.1.2 Tonal errors in the achievement test

Table 2 presents the types and mean frequencies of the tonal errors made by the 26 students during the tonal achievement test.

Table 2

##### *Types and Mean Frequencies of Tonal Errors in the Achievement Test*

Type	T3-2	T4-1	T4-2	T2-1	T4-3	T3-1	N-T1	N-T2	N-T3	N-T4
Mean	4.38	3.73	3.42	3.23	2.5	1.6	0.11	0.11	0	0
%	23	19.5	18	17	13	8	0.5	0.5	0	0

Notes. 1. T3-2 = Tone 3 and Tone 2; N-T1 = Neutral tone and Tone 1

2. % indicates the percentage distribution out of the total number of tonal errors.

These results demonstrated that T3-2 caused the greatest challenge. The mean frequencies of errors with T4-1, T4-2, and T2-1 were close, suggesting these tone pairs were at a similar level of difficulty for the students. The errors with T4-3 and T3-1 occurred less frequently than the others.

The results from the achievement test were in general consistent with the conventional view in the research on CFL. That is, the most difficult tones for American students to acquire were T3-2 or T4-1 (Shen, 1989; Wang, 1995; Yu, 1986). This data was also partially consistent with the findings of McGinnis (1996) and Lu (1992), which demonstrated that T4-2 and T2-1 are difficult to differentiate for native English speakers.

Note that the results from the classroom setting, however, were not quite aligned with the findings of previous studies and differed from the error patterns found in the achievement test. For instance, comparing Table 1 and Table 2, we can see that students made 25% of the errors with T4-3 across all five classes. However, this type of error constituted only 13% of the errors in achievement tests. The differences between these two may be due to the different settings for data collection. Possible reasons for the differences will be discussed later (see Section 5.1). We now turn to the second research question.

#### 4.1.3 Results of students' survey

The second research question focused on how beginning CFL students perceive their teachers' EC and explored the relationship between their perception of EC and their tonal performance in achievement test.

Table 3 presents the mean scores of students' ratings on the ten types of teachers' EC strategies.

Table 3

*The Students' Rating on Ten Error Treatments Strategies*

Type of error correction	Mean
A. Ask student to repeat after teachers	3.15
B. Delay correcting tonal errors until students complete their utterances	3.00
C. Guide students to self-correct by repeating the original question	2.69
D. Accept tonal errors when they do not interfere with communication	2.34
E. Provide linguistic information such as the pitch contour of the tone	2.34
F. Guide students to self-correct through rising intonation	2.30
G. Guide students to self-correct by showing lack of understanding or waiting	1.88
H. Reject student's response and request repetition	1.88
I. Ask others to provide a correct response	1.5
J. Ignore whether students' tones are correct or not	1.38

*Notes.* 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree

The results suggest that the students perceived the strategy of (A) repeating after teachers and (B) delaying correction until they complete the sentence as the top two most preferable EC, with 77% of the students giving them a rating of "agree" or "strongly agree." By contrast, the lowest ratings were given to strategies (I) when the teacher asked other students to provide a correct response when they made errors and (J) when the teacher ignored the tonal errors they made, with 90% of the students giving these two a rating of "disagree" or "strongly disagree." Unexpectedly, the students did not perceive (E) providing linguistic information such as phonetic explanation or the pitch contour of the tone or (D) accepting tonal errors when the errors did not interfere with communication as effective ways to develop their tonal acquisition, with 62% of them rating these two strategies with "disagree" or "strongly disagree." A rating of "disagree" or below were given to the strategies of (G) and (H), where the teacher rejected students' responses, showed lack of understanding, or waited for self-correction without providing a model of the correct tone.

#### *4.1.4 Students' responses to EC and their tonal performance*

A comparison of students' perception of the EC strategies and their performance on the achievement test revealed an interesting pattern. Among all students, 34% of them agreed or strongly agreed with the strategy of teacher leading self-correction, and such students made 5.5 times of less tonal errors than those who disagreed with the self-correction strategy.

#### *4.1.5 EC strategies in five beginning CFL classes*

The third research question asked what types of EC strategies the teachers used and explored if there was a relationship between their EC strategies and perception of EC. Table 4 presents the types and frequencies of EC used by the five teachers.

Table 4.

#### *Types and Frequencies of Error Corrections from the Five Teachers*

Type of correction	Teacher	Teacher	Teacher	Teacher	Teacher	Total	%
	1	2	3	4	5		
1. Ignore errors and continue the instruction	225	164	294	68	67	818	49.1%
2. Model correct responses and request imitations	63	107	90	75	113	448	27%
3. Negate errors with a gesture or give cues by locating the error or repeating students' errors with a stress to mark incorrectness	9	23	7	2	24	65	3.9%
4. Accept responses containing errors by saying "that's all right," "ok," or "very good."	8	12	25	15	2	62	3.7%
5. Request repetition by repeating the original questions	8	5	11	24	2	50	3%
6. Praise an utterance which contains an error, then correct it afterwards without identifying the error	8	10	17	4	8	47	2.8%
7. Negate errors and ask another student or the class to provide corrections	4	2	31	0	8	45	2.7%
8. Request a self-correction by asking questions like "what is it?" or "how do you say it?"	4	14	3	0	2	23	1.3%
9. Identify the source of errors and request self-correction by asking original questions	6	7	2	5	2	22	1.3%
10. Model correct responses without requesting responses	3	6	0	4	7	20	1.2%
11. Repeat students' response with a pause, which locates or indicates an error and request student to self-correct	3	5	4	1	3	16	0.9%
12. Repeat students' utterance which is correct or incorrect without clarifying the purpose of repeating	0	3	0	1	11	15	0.9%
13. Show unintelligible reaction and request a self-correction.	2	6	2	0	1	11	0.7%
14. Confirmation check with alternatives like "A or B?"	3	5	2	0	0	10	0.6%
15. Model correct tones with different phrases.	3	2	0	0	0	5	0.3%
16. Combination of negation, repetition, and explanation	4	0	0	0	0	4	0.2%
17. Request a confirmation by repeating student's response without using a rising intonation	1	1	0	1	0	3	0.1%
18. Request a clarification by "what are you saying?"	0	1	0	0	0	1	0%
19. Repeat students' errors and ask students to identify the errors with a question like "is it correct or not?"	0	1	0	0	0	1	0%

Table 4 shows that the five teachers had different preferences in terms of their EC strategies used in classroom teaching. However, they shared some noteworthy similarities. In addition to ignoring 49.1% of the total number of tonal errors, the teachers modeled correct responses at a frequency of 27% of the total number of EC. This indicates that modeling was the most common way to correct students' tonal

errors. The teachers' use of gestures to negate tonal errors or cues to mark incorrectness only constituted 3.9% of corrections. Another 3% of corrections were requests for repetition by restating the original questions. The teachers guided students to correct tonal errors by themselves 3.6% of the time (EC strategies 9, 11, 13, 14, & 17). For example, the teachers identified the source of errors and requested self-correction by asking original questions at 1.3% and provided alternative responses via forced-choice alternatives at 0.6%. Frequently, however, the teachers accepted and even praised the students' responses containing tonal errors. They accepted students' tonal errors by saying "that is all right" or "okay" at a rate of 3.72% or praised a response containing a tonal error with "very good" at 2.8%. Next, we will turn to the teachers' survey to explore their perspectives on tonal errors and EC.

#### 4.1.6 Results of teachers' survey

Table 5 presents these five teachers' perspectives on the four questions.

Table 5.

#### *Teachers' Perspectives on Tonal Errors*

	Mean
1. What is your opinion about what students need to do to correct tonal errors?	
A. Memorize tones.	3.8
B. Spend more time listening to tapes.	3.4
C. Do a lot of mechanical drills.	3.2
D. Teach more about how to produce tones.	3.0
E. Teach more about how different pitch contours are used in Chinese and English.	2.8
F. Teach more about the function of tones.	2.2
2. What do you think of students' tonal errors?	
A. It is unacceptable; tones are important in the Chinese language.	3.4
B. They will get better, as they learn the language.	3.0
C. It is a natural situation.	2.8
D. I should treat tonal errors more strictly.	2.8
E. They do not spend enough time on tones.	2.4
3. What do you do when your student makes a tonal error?	
A. Ignore some minor errors, so that the students can experience a sense of success.	3.4
B. Give an alternative, "A or B," to have students clarify their response.	3.2
C. Guide students to self-correction via a stress or gesture to mark the error.	3.2
D. Guide students to self-correction via questioning or locating the error.	3.2
E. Correct the errors only when they interfere with communication.	3.0
F. Correct the error immediately until satisfactory production is reached.	2.6
J. Show confusion to prompt students to self-correct.	2.4
H. Provide linguistic explanations such as the pitch contour of the tone.	1.8
I. Reject students' errors by repeating the original question.	1
4. If a student had difficulty in producing a particular tone repeatedly, what would you do?	
A. I will demonstrate how to do it and have the student imitate me.	3.5
B. I will continue to correct the student.	3
C. I will explain the cause of the error.	2.6
D. I will overlook this error temporarily and give him/her more time to think.	2.4

Notes. 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree

As shown in Table 5, memorizing tones received the highest rating at 3.8, close to “strongly agree,” which was considered the best method for acquiring tones from the teachers’ perspective. Although most of the teachers thought tonal errors unacceptable (rating 3.4), they also thought that students would get better, as they became more competent (rating 3.0). They rated treating tonal errors immediately and strictly at 2.6, providing linguistic explanation such as the pitch contour of a tone at 1.8, teaching the function of tones at 2.2, and explaining the cause of the error at 2.6. All these low ratings indicate that the teachers did not think of these types of EC strategies necessarily effective. However, when it came to their actual EC in response to errors, they rated ignoring minor errors at 3.4 and correcting errors only when communication was interrupted at 3.0. These two high ratings corresponded to the observation data, explaining why they ignored 49.1% of tonal errors in their classrooms. They also rated the EC of demonstrating how to produce tones and having students imitate at 3.5. This result was also consistent with Table 4, which shows the teachers modeled correct responses most of the time in the classroom. Interestingly, the teachers also rated comparatively high at 3.2 for EC strategies that encouraged students’ self-correction, but they rarely used such EC in their practice.

In summary, analyses of quantitative data suggest the followings: (1) Patterns of tonal errors seem to be determined by different settings. (2) Students’ tonal performance was related to their perspective on EC, students who preferred self-correction made fewer tonal errors than those who did not like self-correction. (3) 49.1% of the tonal errors went uncorrected in classrooms. (4) Teachers’ corrections in classrooms were inconsistent with their perspectives on tonal errors and corrections. They believed tonal errors are unacceptable, but they often accepted them and even praised students’ utterances containing tonal errors. (5) It is unexpected that both teachers and students did not consider providing some linguistic explanation about tones as an effective EC strategy. (6) All teachers believed that memorizing tones is the best method for acquiring Chinese tones. This assumption influenced their practices in classrooms, but it cannot be verified by any existing research.

Given that the quantitative data may not be able to fully capture how teachers corrected students’ tonal errors, qualitative discourse analysis was applied, because it permits a detailed identification of the interactive process.

#### 4.2 Analysis of qualitative data

The fourth research question explored how EC was collaboratively conducted by teachers and students. Six most representative episodes were selected based on two protocols: (1) It exhibits a typical corrective interaction which commonly occurs in the five CFL classes, and (2) It displays the six scaffolding functions defined by Wood, Bruner, and Ross (1976).

Episode A is an episode from the class of Teacher 1, in which the teacher asked about a student’s name. “T” refers to the teacher, “S” refers to the individual student, “Ss” refers to several students. Underlined and bolded text indicates a tonal error, and the information in brackets explains the exact nature of the tonal error.

Episode A.

A1 T1: Nǐ Jiào shénme?

*What is your name?*

A2 S1: Wáng sī yǔ.

*Wang si yu.*

(Name of the student.)

A3 T1: Zěnmē xiě?

*How do you write it?*

A4 S1: Guó wáng de wáng, sī xiǎng de sī, xiā [T4 as T1] yǔ de yǔ.

*'Wang' as in 'king,' 'si' as in 'thought,' and 'yu' as in 'rain.'*

(Tone 4 'xià' was mispronounced as Tone 1.)

A5 T1: Zài shuō dà shēng yīdiǎn.

*Say it again and louder:*

(the student was asked to repeat her utterance louder with no specific guidance given on her tonal error.)

A6 S1: Xiā [T4 as T1] yú [T3 as T2] de yú [T3 as T2], xiā [T4 as T1], yú [T3 as T2] de yú [T3 as T2].

(The student repeated the first error and created the second error, in which Tone 3 'yǔ' was mispronounced as Tone 2 and repeated both tonal errors twice.)

A7 T1: Xià yǔ de yǔ. Xià yǔ.

*'yǔ' as in rain, rain.*

(The teacher recast the student's utterance and modeled the correct tone.)

A8 Ss: Xià yǔ. Xià yǔ de yǔ.

*'yǔ' is in rain.*

(Students imitated teacher's correct tones)

A9 T1: Xiànzài xià yǔ ma?

*Is it raining now?*

(The teacher asked students a new question with the word that was mispronounced, and the question contains a new word 'xiànzài'.)

A10 Ss: ...

(No response, it seems that students did not understand the question.)

A11 T1: Bú xià yǔ, xiàn...xiànzài bú xià yǔ.

*It is not raining; it is not raining now.*

(The teacher answered the question by himself.)

A12 Ss: Bú xià yǔ.

*It is not raining.*

(Students repeated after the teacher's modeling without the new word 'xianzai'.)

A13 T1: Hǎo, xiě hànzì.

*Then, write characters.*

(The teacher started a new activity and asked students to write characters.)

This episode presents two examples in which the teacher attempted to help students acquire the correct tones without appropriate scaffolding at the students' development level. First, in A4, the student described how to write her name and mispronounced Tone 4 "xia" as Tone 1. The teacher had the student correct her own error by asking her to repeat her utterance louder in A5. It is impossible for the beginning level CFL student to locate and identify tonal errors without specific help. Consequently, the student repeated the tonal error and created a new error, because she was not sure which tone was incorrect, so she made a wrong change. Second, the teacher asked a new question utilizing the mispronounced word to elicit a correct response in A9. The student could not respond and was confused until the teacher modeled the correct response himself in A11, because the new question contained some information that the student was not familiar with, such as the time word *xiànzài* "right now" and the use of verb "raining," which may not have been introduced. Both EC attempts failed, because the teacher's scaffolding did not build on the students' actual development level in the target language, and the students could not make any correction by themselves without any meaningful help.

In contrast, Episode B shows Teacher 2 successfully assisting a student in pronouncing his name by providing pronunciation guidance.

Episode B.

B1 T2: Qǐng nǐ shuō nǐ de míngzì.

*Please say your name.*

B2 S1: Shī shēng [T4 as T1] wéi.

*Shi sheng wei.*

(Tone 4 ‘shèng’ was mispronounced as Tone 1.)

B3 T2: Dàjiā yìqǐ shuō.

*Say it together.*

(The teacher attempted to ask students say it together hoping that other students may provide a correct tone. But did not provide any guidance.)

B4 Ss: Shī **shēng** [T4 as T1] wéi.

*Shi sheng wei.*

(Students repeated the tonal error together.)

B5 T2: shēng → shèng

*shēng → shèng*

(The teacher produced the highest pitch slowly, then dropped it to the lowest pitch quickly to demonstrate how to produce a Tone 4.)

B6 T2 & S1: shēng → shèng

*shēng → shèng*

(The teacher initiated the pronunciation and waited for Student 1 to join him and then dropped their voice from high to low, making a Tone 4 successfully together.)

B7 S1 & S2: Shèng, shèng

*Sheng, sheng*

(Another student jointed in and produced ‘sheng’ correctly twice.)

B8 T2: Shī shèng wéi

*Shi sheng wei*

(The teacher modeled the correct tone once more for reinforcement.)

B9 S1: Shī shèng wéi, Shī shèng wéi.

*Shi sheng wei, Shi sheng wei.*

(Student 1 said his name correctly along with the teacher twice.)

B10 T2: Nǐ jiào shénme míngzì?

*What is your name?*

(The teacher asked student 1 the original question as a follow up.)

B11 S1: Shī shèng wéi.

*Shi sheng wei.*

(Student 1 answered the question with the correct Tone 4 independently.)

B12 T2: Hén hǎo!

*Very good!*

(The teacher praised Student 1’s improvement.)

Episode B presents a successful scaffolding emerging from the corrective interaction. The teacher guided the student's self-correction by demonstrating the pitch difference between Tone 1 and Tone 4 and illustrating how to produce a Tone 4 from Tone 1 in B5. The teacher started his pronunciation slowly with an exaggerated high pitch and waited for the student to join him and then rapidly dropped his voice to the lowest pitch in B6. This pronunciation technique put the students on the foot of the ladder and offered the students with sufficient opportunity to adopt the teacher's technique gradually. Students 1 and 2 followed the teacher's modeling and joined in the corrective interaction to produce not just one but two correct Tone 4 in B7. Student 1 independently produced the correct Tone 4 twice in B9, which indicates that the student was able to generate an adequate Tone 4 after the corrective interaction and demonstrated a progress in learning Chinese tones.

This microgenetic process illustrates Vygotsky's theory that human beings' learning is social in nature and can be traced back to significant learning interactions during development. The EC began with an activity of other-regulation, in which the teacher started by showing the students how to technically and strategically solve the error step by step. With this help the students converted this technique into a tool for their own use, resulting in a self-regulation performance seen in B7.

Episode B also shows how the teacher scaffolded students' learning of tones by introducing the linguistic feature of the fourth tone and providing the technical guidance using a slower rate of delivery, a hallmark feature of simplified input during EC interaction. Thus, the student was encouraged to participate in the corrective process actively and to correct his own errors. This scaffolding process represents one of six scaffolding functions described by Wood, Bruner, and Ross (1976), in which the teacher marked the critical feature of the tone and provided the ideal solution. Furthermore, this episode presents a case where the student and teacher conducted the correction collaboratively, showing how EC is not categorically either implicit or explicit but an interactional modification that provides learners with the input needed for L2 learning (Long, 1996; Sheen & Ellis 2011). However, this type of corrective interaction unfortunately only accounted for 1.3% of the total EC.

Episode C from Teacher 3's class is about instruction on how the same syllable with different tones might create different meanings.

#### Episode C

C1 T3: Zhè ge zì zěnmě shuō?

*How do you say this word?*

(The teacher pointed at a word on the blackboard.)

C2 Ss: Zì [T3 as T4]

*Zì*

(Tone 3 'zǐ' was mispronounced as Tone 4.)

C3 T3: Búshì hànzì de zì, shì érzǐ de zǐ, érzì. Mù zǐ lǐ. Liǎng gè sān shēng, mù zǐ lǐ.

*It is not the 'zì' in 'Chinese character,' but it is the 'zǐ' in 'son,' 'son,' 'mù zǐ lǐ' two third tones appear together.*

(The teacher described that the tone for this 'zǐ' is in 'son,' not in 'character,' also reminded students of the tonal rule for two Tone 3 characters coming together.)

C4 Ss: Mù zǐ [T2 as T3] lǐ

*Mu zi li.*

(Students did not apply the tonal rule of the first Tone 3 changing to Tone 2 when there are two consecutive Tone 3 characters.)

C5 T3: Búshì Mù zǐ lǐ [T3 T3], shì mù zǐ lǐ [T2 T3].

*It is not Mù zǐ lǐ [T3 T3], it is mù zǐ lǐ [T2 T3].*

(The teacher modeled the rule for two Tone 3 together.)

C6 Ss: mù zǐ lǐ.

*Mu zi li.*

(Students imitated teachers' model with some understanding of tone sandhi rule for Tone 3.)

In C3, the teacher described the syllable “zi” with two different phrases, one containing a third tone and the other a fourth tone to assist his students in distinguishing between the different tones and meanings of “zi.” Through the comparison, it helped the students realize the importance of different tones. When the third tone “zi” was mispronounced as the fourth tone, the meaning of “zi” changed from “son” to “Chinese characters.” The description of how a discrepancy between different tones might create different meanings for the same syllable forced students to pay conscious attention to specific linguistic forms and raised their awareness of the tonal feature of the Chinese language. But the five teachers used this type of corrective strategy only 0.3% of the time.

Episode D presents how Teacher 4 raised the students' tonal awareness by providing more implicit EC, such as asking students to confirm whether their utterances were correct and then moved on to a more explicit EC strategy for further assistance.

Episode D

D1 S1: Wǒ yě bú rènshi **tà** [T1 as T4].

*I do not know her too.*

(Tone 1 ‘tā’ was mispronounced as Tone 4.)

D2 T4: Wǒ yě bú rènshi **tà** [T1 as T4], duì bú duì ? **Tà** [T1 as T4].

*I do not know her. Is it correct? Tà [T1 as T4].*

(The teacher repeated the student's utterance with an emphasis on the tonal error and asked the whole class to verify if it was correct.)

D3 Ss: **Tà** [T1 as T4]

*Ta*

(Students repeated the error and could not make correction.)

D4 T4: Bú duì! Oh.

*It is not correct!*

(The teacher negated students' response and wrote ‘tā’ with a Tone 1 mark on the blackboard to remind students of the correct tone.)

D5 Ss: Tā...(laugh)... tā.

*Ta...(laugh)...ta.*

(Students realized ‘tā’ was mispronounced and correct their error by themselves.)

D6 T4: Wǒ yě bú rènshi...(pause) can you say it again?

*I also do not know... can you say it again?*

(The teacher initiated the original utterance and paused at the character that was mispronounced, and asked Student 1 who made the error to complete this utterance.)

D7 S1: Duìbùqǐ, Wǒ yě bú rènshi tā.

*Sorry, I do not know her either.*

(Student 1 not only completed the utterance with a correct tone but also produced the whole sentence correctly by herself.)

D8 T4: Tā, hěnhǎo! Make sure that you just say tā [T1], tā [T1]. Not **tà** [T4].

‘Her’ in English. I know you speak English, ‘I do not know her.’ We say ‘Wǒ yě bú rènshi tā.’

hěnhǎo ... (laugh).

(The teacher briefly explained the tonal error 'tà' [T1 as T4] was caused by English stress on 'her')

D9 Ss: (laugh)...

(Students seemed happy with their learning experience here.)

Episode D displays that the teacher did not immediately provide the standard tone, but rather repeated the students' utterance and asked whether their pronunciation was correct in D2. The students failed to identify the error and repeated the error again in D3. The teacher went a step further and wrote the Pinyin with a tone mark on the blackboard to mediate students' thinking and elicit an appropriate pronunciation from the students in D4. The combination of the visualized sign and the teacher's EC pushed students to realize that they mispronounced Tone 1 "ta" as Tone 4. As a result, they corrected the error by themselves and repeated the correct tone. In D6, the teacher went a step further by repeating a portion of Student 1's utterance and then paused at the place where the error occurred to have Student 1 complete the rest of utterance with a correct tone. This corrective interaction clearly indicates that by narrowing down the location of the error and providing enough linguistic support, the teacher helped reduce the difficulty of tonal learning and led them to transit from dependency on others towards independence and self-regulation. This episode echoed with the scaffolding function of reduction in degrees of freedom in the language task by Wood, Bruner, and Ross (1976). In D8, the teacher identified the source of the error and explained that in English "I don't know her" ends in a falling tone, but in Chinese the same meaning of the utterance ends in a high flat tone. This assistance most likely played a role in the students' developing awareness of the difference between Tone 1 and Tone 4. This episode, once again, clearly shows that by carefully conducting a series of corrective interactions through providing confirmation checks, visual signs, and probing guidance, the teacher can scaffold the students to perform at a higher level of target language proficiency. To guide a self-correction by requesting a clarification from students (EC # 8) and by identifying the source of error (EC # 9 and #16) only constituted 2.8% of the total number of EC.

Episode E shows the strategy of modeling a correct tone.

Episode E

E1 S1: Tā zài **hè** [T1 as T4] niúnǎi ne. Tā zài **hè** [T1 as T4], **hè** [T1 as T4] niúnǎi ne.

*She is drinking milk. She is drinking, drinking milk.*

(Tone 1 'hē' was mispronounced as Tone 4.)

E2 T5: Bú shì **hè** [T4], **hè** [T4], shì **hē** [T1], Tā zài **hē** [T1] niúnǎi.

*It is not **hè** [T4], **hè** [T4], it is **hē** [T1], she is drinking milk.*

(The teacher negated the error, used a stressed voice to model the correct tone, and repeated the correct tone twice.)

E3 Ss: Hē...hē niúnǎi.

*Drinking..., drinking milk.*

(Students imitated the teacher's tone correctly.)

E4 T5: Tā zài ...

*She is...*

(The teacher started the utterance and paused, indicating that students should complete the utterance.)

E5 S2: Tā zài **hē** niúnǎi.

*She is drinking milk.*

(Student 2 completed the sentence with the correct tone voluntarily.)

E6 T5: Hǎo, nǐ shuō ...

*Good, you say it.*

(The teacher asked another student to repeat the utterance.)

E7 S3: Tā zài hē [T1 as T4] niúǎi.

*She is drinking milk.*

(Tone 1 ‘hē’ was mispronounced as Tone 4 again by Student 3.)

E8 T5: Nǐ shuō...

*You say it.*

(The teacher ignored the error by Student 3 and asked next student to provide a correct response.)

E9 S4: Tā zài hē [T1 as T4] niúǎi.

*She is drinking milk.*

(Tone 1 ‘hē’ was mispronounced as Tone 4 again by Student 4.)

**The teacher did not make any correction, and the same error occurred a few minutes later during the students’ interaction.**

E10 S4: Tā zài nǎ hē [T1 as T4] qìshuǐ?

*Where did he drink soda?*

(Tone 1 ‘hē’ was mispronounced as Tone 4 in a different linguistic context by Student 4 again.)

E11 S3: Tā zài cāntīng hē [T1 as T4] qìshuǐ ne; wǒ zài bàngōngshì hē [T1 as T4] qìshuǐ.

*She is drinking soda at the dining hall; I am drinking soda at the office.*

(Tone 1 ‘hē’ again was mispronounced as Tone 4 twice by Student 3.)

The corrective interaction between the teacher’s modeling and the students’ imitation is concerning the first tone “hē.” By simply imitating the teacher’s model, students could not discover the critical features of the tones or understand the reason for their errors, because modeling did not provide enough information that triggered students’ noticing of their errors. Therefore, Students 1, 3 and 4 still did not fully understand their errors and how to improve their tonal performance by the end of the class. This is aligned with Stevick’s (1978) claim that a suitable model must do more than just presenting a standard model. In this case, the teacher should be engaged in building a cognitive ladder helping students develop sensitivity or awareness of Chinese tones.

Finally, Episode F presents a corrective interaction between Teacher 4 and her students, in which the students were frustrated by ineffective EC strategies.

Episode F

F1 T4: Qǐngwèn nín guìxìng?

*What is your surname?*

F2 S1: Wǒ xìng gū [T4 as T1]

*My surname is Gu.*

(Tone 4 ‘gù’ mispronounced as Tone 1.)

F3 T4: Qǐngwèn nín guìxìng?

*What is your surname?*

(The teacher asked Student 1 the same question again without any guidance.)

F4 S1: Wǒ xìng gū [T4 as T1].

*My surname is Gu.*

(Student 1 repeated the error.)

F5 T4: Shénme?

*What?*

(The teacher indicated that she did not understand what Student 1 said by saying ‘what.’)

F6 T4: Nín guìxìng?

*What is your surname?*

(The teacher did not wait for Student 1 to respond his question and went to other students with the same question.)

F7 S1: Oh...oh...

(Student 1 blushed and dropped her head.)

F8 S2: Wǒ xìng Lǐ.

*My surname is Li.*

(Student 2 answered the question correctly.)

F9 T4: Qǐng nǐ wèn tā guìxìng.

*Please ask him what his surname is.*

(The teacher continued to instruct other students to ask the same question to each other. Student 1 was left out.)

**A few minutes later the teacher asked students to practice another question.**

F10 T4: Nǐ zhù nǎr?

*Where do you live?*

(The teacher started another question.)

F11 S3: Wǒ zhù 2201 hāo [T4 as T1]

*I live in Number 2201.*

(Tone 4 ‘hào’ was mispronounced as Tone 1.)

F12 T4: Oh...2201 hào

*Oh...you live in Number 2201.*

(The teacher repeated Student 3’s answer with a correct tone.)

F13 S3: Uh...

(Student 3 failed to respond, shook her head side to side in frustration and did not know what was going on.)

F14 T4: Tā zhù nǎr?

*Where does she live?*

(The teacher walked away and asked other students to provide answers.)

F15 Ss: Tā zhù 2201 hào.

*She lives in Number 2201.*

(The whole class answered the questions correctly.)

F16 T4: Nǐ zhù nǎr?

*Where do you live?*

(The teacher returned to Student 3 and asked her the original question again.)

F17 S3: Em...

(She got stuck and failed to produce anything.)

F18 T4: Qǐng gēn wǒ shuō ‘xuéshēng.’

*Please follow me to say ‘student.’*

(The teacher moved on to another exercise.)

Episode F recorded how Students 1 and 3 felt frustrated and embarrassed by the teacher's EC. The teacher asked Student 1 to repeat her own utterance without any assistance in F3. As soon as she repeated her error, the teacher asked "what?" to indicate an error was produced by her again in F5. The teacher did not then give her enough time to reflect on her own error nor did she offer any help. Instead, the teacher asked another student the same question immediately. Student 1 did not know what was wrong with her utterance, was left alone to struggle with her own problem and eventually lost her opportunity to improve her tones. Student 1 expressed her frustration and embarrassment in F7, and later Student 3 experienced similar ineffective EC in F12-17. When Student 3 was unable to perform at a standard level, the teacher either walked away to ask the whole class to provide a correct answer for her or went on to another unrelated activity. In the end, Student 3 also lost her chance to learn because of lack of support from her teacher. This echoed with the finding of the student survey that 90% of the students strongly disagree with the EC by asking other students or the whole class to provide correct responses.

In summary, four major findings emerged from the analyses of the episodes. First, all five teachers rarely scaffolded students' learning of tones. This finding corroborates the result of quantitative data analyses that 49.1% of tonal errors in classrooms was ignored. In Episodes A, B and F, the teachers expected the students to correct their own tonal errors by asking students to repeat their utterances without providing any clues or hints. Consequently, students either appeared uncertain as to whether their tones were correct or repeated the errors and even created new errors. Although students may have realized something was wrong with their tones and tried to correct errors by themselves, most of the time they failed because of lack of teachers' scaffolding. Second, even when some of the teachers attempted to scaffold students' learning of tones, very few managed to do so successfully, because their attempts were incomprehensible for students. Third, although modeling correct tones was most frequently used by the five teachers, it was not always as effective as expected. Modeling and imitating turned the corrective interaction into a simplistic activity, which might bring about a momentary change, but could not provide sufficient understanding or guidance for students to improve tonal learning. Fourth is that the successful corrective scaffoldings were characterized by followings: (1) The teachers provide the scaffolding during EC in a way that raises the students' awareness of tonal features, so that they gradually become self-sufficient in correcting their errors and controlling their language performance. (2) The teachers provide the scaffolding in a way that permits students to join the process of negotiating meaning and constructing linguistic competence collectively. That is, the scaffolding must be accessible for students and bridge them from dependency on others to independence and self-control.

## **5 Discussion**

### **5.1 Tonal error patterns**

The results of this study shed more light on the nature of Chinese tonal acquisition, demonstrating that tonal error patterns are determined by different settings. For example, the beginning CFL students made more errors on T4-3 in classrooms but more errors on T3-2 in the tonal achievement test. This discrepancy between tonal errors in classrooms and the achievement test may be explained with Labov's attention to speech model. Labov (1969) systematically described varying patterns when native speakers produce language in different situations. His model is used to explain why L2 learners can perform according to their target language competence on one occasion but not another (Bialystock, 1982; Dickerson, 1975; Tarone, 1983; Yuan, 1995). The degree of attention paid by the speaker influences language performance. When taking tonal achievement tests, students paid careful attention to their speech and attempted to maximize tonal control. In classrooms, on the contrary, students may have paid less attention to tones and used relatively more casual speech style while concentrating on the content they wanted to express. Therefore, the degree of attention to speech in different settings is likely to cause variations in tonal error patterns.

These distinctive tonal error patterns may, however, be related. Yuan (1995) found that careful-style speech contains more native-like performance than casual-style speech. The native-like performance, which is initially part of the learner's careful speech, spreads towards casual speech, as the learner becomes more competent. Therefore, the more attention paid to speech, the more correct instances of tones produced by CFL students. This explanation leads to another claim that acquisition of Chinese tones involves a transition process, which converts linguistic knowledge from a controlled language performance into an automated one (cf. McLaughlin, 1990). Controlled language performance requires a lot of attention, but L2 skills can become automatic through practice. Classroom data captured the students' automatic or spontaneous tonal performance, demonstrating which tones had been mastered or internalized and which tone students had not mastered. This finding is significant because understanding the relationship between controlled and automatic tonal performance can reveal the nature of tonal acquisition and help CFL teachers decide how to improve their instructional decisions. Additional study is required to further explore the relationship between tonal errors in different settings and the transition process from controlled to automatic language performance.

## 5.2 Self-correction

The analysis of the relationship between students' tonal errors and their perspectives on EC reveals that students need more opportunities to correct their own errors by following teachers' comprehensible guidance. The results show that students who reported that they preferred teachers guiding them to correct their own errors made fewer tonal errors in the achievement test. That is, students who want to achieve self-correction produce more correct tones, because their attempts to produce correct forms constitute a process whereby language is developed and used consciously. Shonerd (1994) pointed out that success of a self-correction could move an utterance closer to the conventions of the target language. Ganji (2009) also concluded that guiding students to self-correct is a type of suitable feedback which helps learners develop their writing ability and linguistic competence. In agreement with Shonerd (1994) and Ganji (2009), the present study observed that the self-correction process raises students' cognitive awareness of Chinese tones and enables self-monitoring skills to grow.

## 5.3 Linguistic explanation as an EC strategy

One unexpected result emerged from this study is that most teachers and students regarded teachers' resorting to linguistic explanation as an unfavorable EC strategy (students' rating: 2.34; teachers' rating: 1.8). There are two possible explanations: First, the linguistic explanation about tones may be too technical for students to grasp. Second, it may be challenging for teachers to provide accurate or efficient linguistic explanation about tones, especially when there are scarce resources for CFL teacher training that imparts good pedagogical strategies and linguistic knowledge.

Gagne et al. (1987) suggested two reasons why students withdraw their attention from some negative feedback. One is that students perceive themselves as unable to understand the feedback, and another is a tendency of the teachers' explanatory choices to create a negative impression on students. If students perceive teachers' corrections as incomprehensible, they become frustrated and eventually stop attending to the ongoing activity. Thus, the effectiveness of EC depends on the way the linguistic explanation is provided by teachers. That is, explanations can be accessible if they are appropriate for students' development level. In Episode D, for example, the teacher explained the linguistic source of the error by comparing the utterance of "I don't know her" ending in a falling intonation in English but ending in a high flat tone in Chinese. This linguistic comparison draws on students' prior knowledge to facilitate the learning of the target language. Such linguistic comparison, as a result, effectively triggered students'

awareness of their existing tonal knowledge. This shows that not all metalinguistic explanations are useless to students. They can be well received if they are comprehensible at the students' level.

#### **5.4 Ignoring tonal errors**

This study showed that the teachers ignored 49.1% of tonal errors in their classrooms. From the questionnaire, teachers indicated that they believe students must work on their own and take full responsibility for their tonal performance or students would overcome their tonal problems as they became more competent in Chinese language. They also think that memorization is the best way to acquire Chinese tones. Memorization indeed is one of the factors affecting L2 acquisition because memorizing sentences and phrases may enhance students' language skills, such as reading and speaking. Various researchers, however, have found that memorization does not play a major role in L2 acquisition (Cook, 1979; de Cardoba, 1985; Gattegno, 1976; Leontiev, 1981; Stevick, 1976). Cook (1979) asserted that short-term memory capacity develops with age and that one's memory in a L2 is more limited than in one's native tongue, suggesting that L2 acquisition ability may not be enhanced significantly by rote memorization. De Cordoba (1985) also claimed that the center of L2 acquisition is not memorization but rather the development of awareness. The differences in learners' proficiency in L2 are caused by their differences in levels of cognitive awareness. In CFL classrooms, we often see the situation in which some students can write a correct tone mark on paper with or without listening to the teachers' pronunciation, but they cannot pronounce the same tone correctly. In contrast, some students can easily produce correct tones orally, but cannot mark the correct tones on papers. This phenomenon suggests that memorization and perception of tones do not necessarily transfer to tonal production. In the study by Lu (1992), she observed that elementary students' tonal production was better than their tonal perception at the beginning of the term. By the end of the term, it was found that students' tonal perception improved, but the improvement of tonal perception did not correlate significantly with their progress with tonal production. Therefore, CFL teachers should aim to help students eliminate tonal errors by nourishing their tonal awareness and their abilities to produce tones rather than merely focusing on students' effort to memorize tones and expecting students to mature on their own. On the other hand, teachers' inconsistent EC behaviors, namely, correcting some tonal errors and ignoring other tonal errors, may result in negative effects on students' learning tones.

#### **5.5 The strategy of modeling**

This study revealed that the teachers appeared to respond favorably to guided self-corrections, but in practice they rarely assisted students in correcting their own errors. They relied heavily on modeling correct tones, a simple way to handle tonal errors. From this study we may conclude that simply asking students to imitate teachers' model of correct tones may not be an effective EC, because it provides limited linguistic support and only brings a temporary change in students' tonal performance. Furthermore, Lu (1992) found no correlation between the students' ability to imitate their teachers' utterances and the students' ability to read these utterances correctly alone. Stevick (1978) also pointed out that learning of pronunciation not only involves neuromuscular ability but also cognitive skills. Heron and Tomasell (1988) reported that implicit CF, in which teachers correct students' errors by providing cues such as indicating the location of the errors, was much superior to the modeling method for both teaching new structures and reviewing old structures. All these results suggest that CFL teachers should reconsider use of modeling as the main corrective strategy in their classrooms. From a cognitive perspective, CF is hypothesized to facilitate acquisition if learners can first notice the error and then learn to repair their own erroneous utterance. Teachers cannot just simply drill and correct the pronunciation; they must develop more effective strategies to improve students' tonal awareness and cognitive skills such as self-monitoring.

## 5.6 Teachers' scaffolding and students' participation

Through an inquiry into the role of teachers' scaffolding and students' participation in the process of corrective interaction, this study was able to capture a few successful examples of scaffoldings. It provided evidence that students were able to make use of EC to advance their tonal knowledge and correct their errors when the corrective scaffolding was given in an appropriate and interactive way. That is, when teachers and students co-constructed the linguistic knowledge and moved gradually from the external corrective interaction to the students' self-assistance. For example, in Episode B, the teacher marked the critical features of tones strategically by leading students to drop their voice from the highest pitch to the lowest rapidly to produce a correct fourth tone. In Episode D, the teacher drew students into the corrective interaction by using an exaggerated voice to emphasize the pronunciation technique of the first tone, and then waited for students to attend to the cue and improve their own tonal performance. Episode D also shows that the teacher reduced the complexity of the language task by helping students to locate a tonal error and guiding students into correction of their own errors. Therefore, EC should be conducted in ways that allow teachers and students to construct the target language knowledge collaboratively and share the responsibility of corrective interaction. This finding supports the claim made by Aljaafreh and Lantolf (1994) that EC can be useful when other-regulation (other-correction) becomes relevant and can be appropriated by learners to modify their own language performance.

## 6 Conclusion

This study is distinct from previous studies. First, it combines both sociocultural and cognitive perspectives to focus on the process of EC interaction to explore a better way to support L2 learning. Second, it demonstrates that only when students really participate in EC interaction, can it elevate students' cognitive awareness of linguistic forms and improve their learning. Third, it reveals how students can overcome their tonal errors with appropriate scaffoldings from teachers. These three factors contribute to students' L2 development, especially to learning Chinese tones.

Moreover, the microgenetic analysis of corrective interaction in this study illustrates how teachers and students work together to construct a new linguistic competence and eliminate students' tonal errors during corrective interaction. It bridges the gap between teachers' EC and students' L2 development and demonstrates what types of EC lead to successful results and what fails to facilitate students' tonal acquisition. Therefore, this study paints a fuller picture of the EC process and helps teachers understand how successful EC is constructed by both teachers and students interactively and collaboratively.

The findings of this study support the arguments that the effectiveness of EC cannot be measured by the students' output alone, but rather by the process of students' development from external corrective interaction to internal self-assistance, which can take place in the classroom through proper scaffoldings. The acquisition of Chinese tones involves a transition process, which converts linguistic knowledge from a controlled language performance into an automated one (McLaughlin, 1990). To assist students' L2 learning effectively, teachers must understand the potentials of different EC types and make better choices in accordance with linguistic targets, interactional contexts, and students' ZPD.

There are some limitations in this study. This study was conducted with five first-year CFL classes at the college level in the United States and in the context of Chinese tonal learning. The results of this study, therefore, might not apply to other levels of CFL classes. In addition, some uncontrollable variables may affect the outcome of this study, for example, students' aptitudes, motivations towards tonal learning, their previous learning experiences, the amount of contact those students had with Chinese outside of classrooms, and the types of tonal instruction they received are all relevant factors. These factors are beyond the scope of this investigation. Moreover, audiotaping classes may have

excluded some important nonverbal information such as facial expression and gestures from the analysis of corrective interaction.

Despite these limitations, this study has illustrated how corrective scaffolding is essential for Chinese tonal acquisition and suggested useful techniques to help teachers and learners overcome the challenges in teaching and learning tones. More importantly, it opens possibilities for future investigations to examine EC through the double lenses of sociocultural and cognitive perspectives.

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## 从社会文化理论和认知语言学的角度解析纠错对汉语声调习得的影响

敖群

西点军校, 美国

### 摘要

本文从以下几个方面入手分析, 探讨老师怎样才能更好地协助汉语作为外语的学生学习声调: (a) 学生在课堂上和朗读时声调错误的不同; (b) 老师处理声调错误的方法; (c) 学生的声调错误与他们对纠错的看法之间的关系; (d) 老师的纠错行为与他们对声调错误和纠错策略的看法之间的关系。收集的数据包括对 5 位一年级中文老师 15 个小时的课堂观察和录音; 26 个学生 2 小时的朗读测试录音; 老师和学生的问卷调查。研究发现, 在不同环境中对说话的注意力程度会导致不同的声调错误模式。有自我纠错倾向的学生在朗读测试中错误出现率较低。对于各种声调纠错的方法, 老师和学生最不喜欢的是用描述声调图的策略。另外, 简单地要求学生重复老师的示范是效果最有限、但使用最多的方法。老师们还常常忽略声调错误, 并希望学生通过记住声调来克服他们的错误。本研究结果与 Vygotskyan 的纠错是“协作活动”的观点一致, 展示出只有老师和学生在纠错过程中共同建立关键语言知识, 才可以成功地把学生从外部纠错互动提升到自我帮助的境界。根据研究结果, 本文给老师们提供了一些如何有效地纠正声调错误的建议。

### 关键词

纠正反馈, 纠错, 汉语声调, 社会文化理论, 脚手架策略

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