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The Acquisition of English Word Stress by Mandarin EFL Learners

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Abstract

Compared with the study of acquisition of syntax and morphology, there is a relative lack of research on the acquisition of phonology, the L2 acquisition of word stress in particular. This paper investigates the production of word stress by 70 Chinese college students in their reading aloud. Altogether 350 minutes' recordings were collected and coded. The result shows that improper assignment of word stress most likely occurs in two-syllable words and three-syllable words and on the first syllable. The factors which account for these problems are learners' insensitivity to syllabic structure of English words and lack of knowledge of rules on English word stress.

Keywords: word stress; stress misplacement; syllabic structure

1. Introduction

Within second language acquisition and applied linguistics research, certain aspects such as syntax or morphology have received a lot of attention among researchers (Doughty & Long, 2003; Hawkins, 2001; White, 2003), while the study and teaching of pronunciation has been "marginalized" (Derwing & Munro, 2005). The L2 acquisition of word stress is a major part that is understudied.

Learning the pronunciation of a foreign language involves not only the segments, i.e. the sounds of the L2, but also the acquisition of suprasegmentals, e.g. the placement of stress or the intonation. Incorrect placement of primary stress in L2 words may lead to the breakdown of communication. Empirical research has confirmed the importance of prosodic features in learners' overall intelligibility and perceived comprehensibility. However, relatively little research has been conducted to investigate the second language acquisition of suprasegmental elements (e.g. pitch accent, tone, stress, intonation) (Davis & Kelly, 1997; Guion et al., 2004; Guion, 2005).

In addressing the acquisition of English word stress, the objectives of the current study are to find out whether Chinese college students are able to assign stress accurately and if not, what kinds of English words are the most problematic for Chinese learners. It also tries to explore the possible factors which can account for stress misplacement.

2. Literature Review

Linguists don't reach an agreement on how to define "stress". Chomsky and Halle states in their book "The Sound Pattern of English" (1968) that "… the optimal grammar of English is one in which stress is predicted by rule rather than one in which stress is inherent in the phonological matrix of a lexical entry."

In stress languages, there is usually one syllable in a word that is more salient than other syllables. It is pronounced with more prominence so that it stands out acoustically and perceptually. Four parameters (loudness, length, pitch and quality) work in combination to decide which syllable can be identified as the stressed syllable (Roach, 2008). A stressed syllable should be produced louder than others. It should be pronounced longer and with a higher pitch. And it has a vowel which is different in quality to the neighboring syllables. Languages can be categorized into two groups: 'predictable stress languages' and 'non-predictable stress languages'. Stress performs different functions in different types of languages. In the former group, such as French or Finnish, the stressed syllable is regular and the stress position for a given word can be predicted based on phonological characteristics of the word alone. So stress can serve to demarcate a word edge. In the latter group, such as English and Spanish, primary stress is not fixed to a given position, and different placement of stress may result in difference in meaning or part of speech. This can be seen in noun/verb and noun/adjective pairs such as

im**port/im**port and ***con**tent/con**tent***, respectively. But it doesn't mean the stress is randomly assigned. In such languages, the phonological characteristics of the word are not the only factor determining how the stress is placed.

Mandarin Chinese is a typical example of tone language, in which four different phonemic tones can be distinguished depending on the pitch contour over a syllable with loudness and duration playing no important phonological role at the level of lexical contrast (Duanmu, 2000). The four tones with T1 a high level tone, T2 a rising tone, T3 a dip-rise, T4 a fall, serve to distinguish the meaning of the word. For example, ma1 refers to mother, ma2 hemp, ma3 horse and ma4 scold. But Chinese linguists don't agree with each other on whether Chinese has stress or not. And those who think tone and stress coexist in Chinese haven't reached an agreement on where the stress should be placed (Duanmu, 2000). Some propose that Chinese has final stress because the final syllable is always the longest in a word, but Duanmu (2000, 2006) proposes that Mandarin Chinese has initial stress due to the alteration of strong and weak syllables.

Most of the previous studies on second language acquisition of English word stress have taken the effect of learners' first language into consideration. Some studies focused on the acquisition of English word stress by learners whose native languages were also stress languages and showed the evidence of the transfer of the first language (Archibald, 1992; Archibald, 1993). But Archibald's later study (1997) in which learners' native languages were two non-stress languages (Chinese and Japanese) proposed that Chinese and Japanese learners stored the English stress lexically rather than compute metrical structure. Heidi Altmann (2006) in his dissertation investigated the influence of native language stress properties on the second language acquisition of primary word stress. Perception and production of novel words of different number of syllables by seven different L1 groups (Arabic, Chinese, French, Japanese, Korean, Spanish, Turkish) and native English speakers were compared. The results showed that learners with predictable stress in their native language (Arabic, Turkish, and French) did poorly in perceiving the location of stress while in production they were native like. But for learners whose native languages neither have word-level stress (Chinese, Japanese, Korean) nor have predictable L1 stress (Spanish) performed well in perception while their production were quite different from the native speakers.

In recent years, researchers in China began to examine the Chinese learners' acquisition of English word stress. Chen (2008) investigated the perception and production of English stress by Chinese learners. The results showed that Chinese learners had some difficulties in perceiving and producing English word stress correctly. Negative transfer of mother language, failure to be sensitive to the vowel length and overgeneralization of English word assignment rules are among the main reasons. Zhang (2010) administered two production experiments with one on stress placement in real English words and the other on stress placement in non-words. The findings showed that Mandarin EFL learners mainly relied on lexical class to place stress on disyllabic non-words. They could not use syllabic structure distinction to correctly assign stress on the disyllabic non-words, which demonstrated that they were not sensitive to syllabic structure of English words. Yuan & Cheng (2017) investigated advanced Chinese learners' acquisition of English word stress. They examined the subjects' production of nonce words of two-syllable and three-syllable and found that Chinese learners were able to place stress correctly in two-syllable words and three-syllable words with a heavy penultimate syllable.

3. Research Design

3.1 Participants

Seventy participants, sixty-five females and five males, were recruited from the English Department, School of Foreign languages, Shaanxi Normal University with the age ranging from 18 to 20 years. All of them are first-year students with the number of years studying English ranging from 7 to 11. None of the participants were reported to have any language or reading disorders or any hearing problems. They have been learning English as a foreign language in the formal instruction context and none of them reported being to English-speaking countries.

3.2 Procedure and Material

After the consenting process, the researcher interviewed subjects to gain personal information. Then participants were given about 10 minutes for preparation of the reading task. Then they were seated comfortably in front of a computer in a language laboratory, wearing a head-mounted microphone with the microphone about two inches out from and just to the left of the mouth. Their readings were audiotaped and coded by the author of the present paper and an American teacher who was teaching oral English in Shaanxi Normal University. Both of them listened to the recording and marked out the stress assignment errors. The judgment agreement rate between the two judges was 98%. In the cases of discrepancy in judgment, the two judges listened to the recording and made

a final judgment. In order to explore the factors contributing to the word stress misplacement, 10 students with the most stress assignment errors were interviewed.

The material used for reading aloud task is an English story of about 600 words. Altogether there are 350 minutes' recordings.

4. Results and Discussion

The results are presented into two main parts: first, improper assignment of word stress is discussed in detail and secondly the factors that cause the misplacement are explored.

4.1 Misplacement of Word Stress

In 70 students' recordings, there are 155 word stress assignment errors.

Table 1. Error frequency and percentage of the eight most problematic words

	Word	Number of syllables	Frequency	Percentage
1	Pacific	3	31	20%
2	Seattle	3	16	10.3%
3	geography	4	16	10.3%
4	concern	2	15	9.7%
5	idea	2	14	9%
6	somehow	2	13	8.4%
7	somewhere	2	11	7.1%
8	console	2	11	7.1%
total			127	81.9%

The table above shows that participants have difficulty in placing the stress to the right position in these 8 words: *Pacific, geography, Seattle, concern, idea, somehow, somewhere, console*. Two-syllable words have the highest error rate as indicated by the frequency of 64 errors while three-syllable words have the second highest error rate with 47 errors.

4.2 Factors Accounting for the Misplacement of Stress

4.2.1 Inadequate Knowledge of Syllabic Structure

The structure of syllable usually determines whether a syllable is strong or weak. A strong syllable contains a long vowel or diphthong with or without a coda, or a short vowel followed by a coda (one or more final consonants). A weak syllable contains a short vowel and no coda unless the syllable peak is a schwa /ə/ (Roach, 2008). A strong syllable is generally stressed, while the weak one is generally unstressed. For example, in the word *release*, the first syllable [rɪ] has no coda thus it is a weak syllable, while the second syllable [li:s] is a strong syllable as it contains a long vowel [i:] and a coda [s]. Consequently, the stress should be placed on the strong syllable, i.e. the second one.

In the words of *concern* and *console*, the first syllable contains the schwa /ə/, thus making it weak syllable, and should be unstressed. But 26 participants put the stress on the first syllable for these two words. According to the rule for the placement of stress in two-syllable nouns, if the second syllable contains a short vowel, then the stress will usually come on the first syllable. Otherwise it will be on the second syllable (Roach, 2008). In the word "*idea*", both the first and second syllables contain the diphthong, and the second syllable is stressed. But 14 participants stressed the first syllable. In the word "*geography*", the first, third and final syllables contain short vowel /i/ and /ə/, thus the antepenultimate syllable should be stressed. But 16 participants put the stress on the wrong place.

4.2.2 Mispronunciation of Vowels

Mispronunciation of vowels means that learners pronounce the vowels incorrectly, which leads to the wrong placement of stress. As can be observed, the word *Pacific* is the most problematic because it causes many errors in stress placement. In the word *Pacific*, the first syllable contains the schwa /ə/, which normally cannot get stress. But most students pronounced this word as ['pæsifik], thus giving the first syllable the most prominent

stress. As for the word *Seattle*, most of the students pronounced it as ['siətl], which automatically switched the stress to the first syllable. Thus, the mispronunciation of the vowel sound influences the stress placement.

4.2.3 Dependence on Lexical Class

Table 2. An analysis of the eight most problematic words

	Word (Number of syllables)	Correct Stress Position	Move to the first syllable	Move to the second syllable	Move to the third syllable	Move to the fourth syllable
1	Pacific（3）	Second syllable	31			
2	geography（4）	Second syllable			14	2
3	Seattle（3）	Second syllable	16			
4	concern（2）	Second syllable	15			
5	idea（2）	Second syllable	14			
6	somehow（2）	First syllable		13		
7	somewhere（2）	First syllable		11		
8	console（2）	Second syllable	11			
Total			87	24	14	2

From the table above, most participants tend to move the stress location from the second syllable to the first syllable. One reason might be most of the problematic words, such as *Pacific*, *Seattle*, *geography*, *concern*, and *idea* are all nouns in the reading passage. In English, nouns more likely have stress on the initial syllable while verbs have stress on the ultimate syllable (Kelly & Bock, 1988; Davenport & Hannahs, 2005). In Zhang's study (2010), Mandarin EFL learners also preferred to place stress on the initial syllable. The result is consistent with the previous findings that Chinese students rely more on lexical class in deciding where to place the stress in English words (Guion et al., 2004; Zhang, 2010).

4.3 Interview

To supplement the recording, an interview was conducted to examine the subjects' attitudes about the learning of English word stress.

When interviewed, most of the participants said they knew very little about English word stress. The typical response is as follows. "When learning English words, I just tried to pronounce the sounds correctly. If the words contain more than one syllable, I'm confused about where to put the stress. When the teacher corrects my pronunciation, she just asks me to follow her without telling me why I should put the stress to a certain syllable. Then I try to memorize the correct pronunciation by imitating and repeating." Some participants also mentioned: "The main purpose of learning English is to pass the entrance examination. The major part of learning is to memorize new words and learn grammatical rules with very little time devoting to oral English practice. Good pronunciation is usually ignored."

5. Implications

The present study set out to investigate whether Chinese college students are able to correctly assign word stress and if not, what kinds of English words are the most problematic for Chinese learners. From the above findings, it can be concluded that Chinese EFL learners have difficulties in assigning stress, especially to the two-syllable words and three-syllable words. Their misplacement of English word stress might be due to less importance attached to the learning of English word stress, learners' insensitivity to syllabic structure of English words and

lack of knowledge of rules on English word stress. There are some implications for English teaching in China:

Firstly, in our future English teaching, teachers and students should become aware of the importance of word stress in pronunciation and communication. Teachers should be provided with more training in pronunciation teaching, so that they are ready for their teaching work. Students should also be provided with explicit teaching of stress placement rules so that they would be able to produce stress accurately.

Secondly, in the language of Chinese, tones count more in determining the meaning of words than stress, so learners first need to develop their ability to discriminate the difference between the stressed and unstressed syllables of English words. Correct perception can help learners produce English word stress accurately.

Thirdly, with the development of science and technology, speech analysis software can be used to provide visual feedback for L2 segmental and suprasegmental production in pronunciation instruction. A growing body of research has shown that the implementation of speech analysis software is more effective than traditional approach in which the teacher demonstrates and students imitate.

6. Conclusion

In stress languages, such as English, one syllable in a word is more prominent than all other syllables. The acquisition of stress plays an important part in second language acquisition. Incorrect stress assignment may lead to intelligibility problems for foreign learners. Since the rules for English word stress placement are very complicated and there are some exceptions, it is difficult to predict English word stress, thus posing a big challenge for L2 learners. Chinese EFL learners acquire no or very little knowledge about the rules of English word stress assignment, so they would learn stress word by word or even pay no attention to it. The result of this study shows that Chinese EFL learners have difficulties in assigning stress, especially to the two-syllable words and three-syllable words. Two factors can account for the stress misplacement: inadequate knowledge of syllabic structure and mispronunciation of vowels. So teachers and learners need to pay more attention to L2 acquisition of phonology.

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