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The Effect of L1 Chinese Transfer on L2 English Learning: A Brief Review of the Research

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***Abstract*—This review examines eight research articles, conducted in the past two decades, focusing on the L1 Chinese transfer on L2 English learning. These studies analyzed the transferred function of L1 Chinese from phonological and morphological aspects. The phonological studies indicated that the Chinese pinyin system contributes to a shared phonological process for bilingual reading acquisition. The morphological studies revealed that both in Chinese and English, inflection, derivation, and compounding are the principal methods for word formation. Thus, practice of morphological principles in Chinese characters contributes to L1 Chinese transfer on L2 English learning. In addition, these studies emphasized that lexical exposure and extensive reading are the best ways to improve Chinese EFL learners' English comprehension.**

***Index Terms*—L1 Chinese transfer on L2 English, English language learning, phonology, morphology**

I. Introduction

Since the late 1970s, English has been a mandatory course in all secondary and postsecondary schools in China. In 2002, English courses entered primary schools from grade three to grade six. Currently, China has the largest population of EFL (English as a Foreign Language) learners around the world. Unfortunately, most Chinese students perceive much pressure and anxiety in their language learning processes (Hu, 2003), partly due to the total difference between the alphabetic English and the logographic Chinese. Chinese linguists claim that the best method of learning English is completely disregarding Chinese and studying English vocabulary and grammar through immersion (Gao, 2008). Thus, the majority of Chinese EFL learners hold that English is very useful but is too difficult to conquer.

I taught Chinese college students English for more than fifteen years. I found that the college students had learned English for a total of ten years since the third grade, but most of them had relatively poor English grades and most of them did not like English very much. This lack of a sense of accomplishment in the early years leads to a sense of anxiety and frustration in later English language learning processes. The typical cramming method and the constant low grades in the high-stakes tests contribute to a strong sense of failure among the EFL learners in China. Is English really unconquerable?

I have strong doubts regarding the big gap between the two languages and the immersion method. Such doubts lead to my research question: Are there any similar rules of phonology and morphology between Chinese and English? Can we use the prior Chinese language knowledge as the base for English language learning? In other words, is there L1 Chinese transfer on L2 English learning in the areas of phonology and morphology? First, the Chinese pinyin system (the spelled-out sounds of Chinese characters) is based on the Roman alphabet, which is the same for English. Second, like English, inflection, derivation, and compounding are the basic principles for Chinese word formation. Why not use prior Chinese knowledge to help Chinese EFL learners to learn English? Therefore, it is worthwhile to conduct a literature review on L1 (Chinese) transfer on L2 (English) learning.

In order to find the relevant journal articles analyzing the transfer function of L1 Chinese on L2 English, I chose the articles from the peer-reviewed journals focusing on reading research, applied linguistics, and multilingual research from 2000 on. I put the search terms "L1 transfer on L2 English" and "phonological relation between English and Chinese" and "morphological relation between English and Chinese" into Google Scholar. When I reviewed these articles, I paid attention to the following six aspects: research questions, methodologies used, the contexts in which the study took place, the populations studied, findings, and conclusions. Finally, I chose eight peer-review journal articles as the base of my review.

II. L1 Chinese Transfer on L2 English Learning: Phonology

The Chinese pinyin is an alphabetical system indicating the spelled-out sounds of Chinese characters, and it is based on the Roman alphabet that is the same for English. The pinyin system is "the official phonetic system for transcribing the pronunciations of Chinese characters into the Latin alphabet in mainland China, Taiwan, and Singapore" (Snowling & Hulme, 2005). Several researchers examined the features of pinyin and found that pinyin is a good instrument for Chinese character learning and is helpful for L2 English learning.

Lin et al. (2010) conducted research to examine how Chinese pinyin helped Chinese children learn Chinese characters. A group of 296 native Chinese children in the third year of kindergarten in Beijing participated in this study. The study lasted 12 months. The results indicated that children's early pinyin skills play an important role in their later reading development. Additionally, the findings supported the idea of a universal phonological principle and suggested that pinyin is potentially an ideal measure of phonological awareness in Chinese. Due to the universal phonological principle, the syllables in pinyin can be divided into onset, rime, tone, phonemes, etc. Pinyin practice strengthens Chinese children's phonological awareness (see Table 1).

TABLE 1
CHINESE PINYIN AND CHINESE CHARACTER EXAMPLES

Pinyin	k àn	tīng	xué	shōu huò	děng dài	qín láo	yǒng gǎn
Onset & rime	k an	t ing	x ue	sh ou h uo	d eng d ai	q in l ao	y ong g an
Chinese character	看	听	学	收获	等待	勤劳	勇敢
English translation	look	listen	learn	harvest	wait	Hard- working	brave

In China, elementary school students spend their first school year learning the pinyin spelling system. In second and third grade, pinyin is the primary self-teaching device for their Chinese character learning. The results of this study suggest that L1 Chinese transfer on L2 English is possible because of Chinese children's phonological awareness practiced and enhanced throughout the pinyin system (see Table 2).

TABLE 2
CHINESE PINYIN AND CHINESE SENTENCE EXAMPLES

pinyin	rén zhī chū，xìng běn shàn	xìng xiāng jìn，xí xiāng yuǎn	liǎng gè huáng lí míng cuì liǔ yī háng bái lù shàng qīng tiān
Chinese sentence	人之初，性本善。	性相近，习相远。	两个黄鹂鸣翠柳， 一行白鹭上青天。
English translation	Man on earth, good at birth.	The same nature, Varies on nurture.	Two golden orioles sing amid the willows green, A row of white egrets flies into the blue sky.

Shu, Anderson, and Wu (2000) examined Chinese children's phonetic awareness in an elementary school in Beijing. The participants included 113 students in second, fourth and sixth grades. The participants were asked to represent the pronunciation of 60 compound characters consisting of semantic and phonetic components. The results indicated that Chinese children's phonetic awareness develops over their elementary school years (see Table 3).

TABLE 3
EXAMPLES OF CHINESE COMPOUNDS OF SEMANTIC AND PHONETIC COMPONENTS

characters	河 hé	湖 hú	植 zhí	雹 báo
structure	Semantic + phonetic	Semantic + phonetic	Semantic + phonetic	Semantic + phonetic
English translation	river	lake	plant	hail

Wang, Perfetti, and Liu (2004) investigated cross-language and writing system transfer in biliteracy acquisition between Chinese and English. The participants included 46 immigrant Chinese children in second and third grades in a public elementary school in Washington D.C. The participants also attended weekend Chinese schools continuing their learning. The participants took phonological and orthographic tasks both in English and Chinese. The results indicated that Chinese onset matching skill is significantly correlated with English onset and rime matching skills. Pinyin was highly correlated with English pseudoword reading. Orthographic processing in the two writing systems do not predict each other's reading capabilities because Chinese is a logographic language while English is alphabetic. The findings suggest that Chinese and English have a shared phonological process for bilingual reading acquisition. These results confirmed the L1 Chinese transfer on L2 English learning in the aspect of phonology (see Table 4).

TABLE 4
EXAMPLES OF THE SIMILARITIES BETWEEN THE SYLLABLES OF CHINESE PINYIN AND ENGLISH

Chinese sentence	读书使人充实。
Pinyin syllables	d-ú / sh-ū / sh-ī / r-én/ ch-ōng / sh-í
English translation and syllables	Reading makes a full man. r-ea-ding/ m-a-ke-s/ a/ f-u-ll /m-an

These three studies demonstrate that pinyin is an ideal instrument for Chinese children's learning in Chinese characters. The universal phonological principle is consistent with such results. Pinyin, like English, is based on 26 alphabet letters. Due to the rich experiences of how to use pinyin in Chinese learning and the universal phonological principles, it is possible for Chinese children and adults to utilize L1 Chinese transfer on L2 English learning in terms of phonological awareness. These studies illustrate forceful evidence that Chinese EFL learners should not totally disregard but make full use of the phonological principles in Chinese for their L2 English learning.

III. L1 CHINESE TRANSFER ON L2 ENGLISH LEARNING: MORPHOLOGY

Although Chinese is totally different from English in terms of orthography, the universal morphological principle indicates that L1 Chinse transfer on L2 English learning is crucial for Chinese EFL learners.

Shu and Anderson (1997) examined the role of radical awareness in Chinese characters and the word acquisition of Chinese children. The participants were elementary school children in Beijing. The researchers took two experiments. The first experiment consisted of 220 students in sixth grade and the second consisted of 72 students in third and fifth grades. The test results indicated that Chinese children have a functional awareness of the relationship between the root of a character and the meaning of the characters. Additionally, this study suggested that children's knowledge of morphology develops with their grade level (see Table 5).

TABLE 5
EXAMPLES OF THE RELATIONSHIP BETWEEN THE SEMANTIC AND PHONETIC COMPONENTS OF CHINESE CHARACTERS

Characters	惚	湖	糊	莉	锂	狸
pinyin	Hū	hú	hū	lì	lǐ	lí
English translation	absent-minded	lake	Paste	jasmine	lithium	leopard cat

According to Shu and Anderson (1997), in modern Chinese, 80% to 90% of the Chinese characters are compounds of semantic and phonetic components. The semantic part is called the radical part of a character and the phonetic part illustrates the pronunciation of a character. In elementary school, Chinese children learn the basic 3,000 Chinese characters, which are primarily and frequently used in media and communication. Among the 3,000 characters, 2,000 of them are compounds of semantic and phonetic components (Shu and Anderson, 1997). Besides this point, both in Chinese and English, inflection, derivation, and compounding are the principle methods for word formation. Therefore, such substantial practice of morphological principles in Chinese characters contribute to L1 transfer on L2 English learning (see Table 6).

TABLE 6
EXAMPLES OF WORD FORMATION IN CHINESE AND ENGLISH

word formation	Chinese	English
inflection	男孩们（男孩+们）	boys (boy + s)
derivation	现代化 （现代 + 化）	modernize（modern + ize）
compounding	洗手间 （洗手 + 间）	Restroom (rest+ room)

Ku and Anderson (2003) investigated the development of morphological awareness in Chinese and English among Chinese and American students. The participants included 412 Taiwanese and 256 American students in second, fourth, and sixth grades. The results demonstrated that the morphological awareness develops with grade level and that this awareness is strongly related to reading ability. Moreover, this study revealed that Chinese students' acquisition of derivational morphology seems to lag behind that of compounding rules, signifying there are fewer derivatives than compounds in Chinese. These results supported Shu and Anderson's (1997) research results about Chinese children's morphological development within the grade level (see Table 7).

TABLE 7
EXAMPLE OF THE SIGNIFICANCE OF MORPHOLOGICAL AWARENESS IN CHINESE READING

The text	那是在世界上最美丽最可爱的小房间了，有一只柔软舒服的床，上面有绿绸的被，绿天鹅绒的褥。在房间的中央，有一个小喷水器，向空中射出一股绿色香水的水花，水花回落在一只雕刻得很美丽的绿色大理石的盆子里(Baum, 2016)。
morphological awareness	房，绸，被，鹅，绒，褥，理， 盆

IV. L1 CHINESE TRANSFER ON L2 ENGLISH LEARNING: PHONOLOGICAL DECODING

Hamada and Koda (2010) examined the role of phonological decoding in L2 English word-meaning inference. The participants included college-level EFL learners. One group consisted of 15 native Korean and one native Turkish. In contrast, the Korean language is logographic while Turkish is alphabetic. Another group consisted of 13 native Chinese and four Japanese. Both Chinese and Japanese are logographic languages. The results indicated that in contrast to logographic L1 languages, alphabetic L1 Turkish language is associated with better decoding. Furthermore, the results pointed out in the L1 Turkish alphabetic group, the relationship between decoding, efficiency and meaning-inference is stronger than the L1 logographic group. However, the results announced that the two different groups did not differ in meaning-inference performance. This study provided forceful evidence that phonological awareness also plays an important role in word-meaning inference. In other words, morphology and phonology work together within one language contributing to the learner's word knowledge and vocabulary ability (see Table 8).

TABLE 8
EXAMPLES OF THE LANGUAGES OF ENGLISH, TURKISH, KOREAN, JAPANESE AND CHINESE

English	Industry: Lose no time (Franklin, 1726).
Turkish	endüstri: hiçbir zaman kaybetmek
Korean	근면하다, 물 낭비 다.
Japanese	勤勉で、時間を無駄遣いしている。
Chinese	勤奋：勿浪费时间。

V. L2 ENGLISH LEARNING: MORPHOLOGICAL AWARENESS AND READING COMPREHENSION

Zhang and Koda (2013) examined the relationship between morphological awareness and reading comprehension in English among EFL learners. The participants included 245 sixth graders in a public elementary school in a small town in Northeast China. Data was collected in the regular English classes at the end of the school year. All items in the surveys tested the participants' morphological awareness, vocabulary knowledge, grammatical knowledge, and reading comprehension. The results indicated that EFL learners' inflectional awareness is better than the derivational awareness, and that compound awareness is better than derivational awareness. In addition, derivational and compound awareness independently predicted English reading comprehension over vocabulary and grammatical knowledge. These findings suggested the vital role of morphological awareness in English reading comprehension (see Table 9).

TABLE 9
EXAMPLE OF READING COMPREHENSION FOR THE SIXTH GRADERS

Jill and Kate are going hiking with their class tomorrow. They went to take some fruits with them. Jill likes oranges and Kate likes apples. When they get to the market, they can't find any oranges, and the apples are too green. "What are we going to buy now?" asks Kate "Hey, what's that big round fruit over there?" asks Jill. "I don't know. Let's ask the salesgirl." "What do you call this?" "Youzi,"answers the girl. "Why don't we buy one?" Asks Jill "OK. We're going to have lots of fun hiking and eating a new kind of fruit!" says Kate ("English test for the sixth graders," n.d.).

Before the above study, Zhang and Koda (2011) conducted a research in order to identify how the morphological awareness and lexical inference contribute to vocabulary knowledge and reading comprehension among advanced EFL learners. The participants included 130 adult EFL learners working on their engineering master's degrees at a university in China. The results demonstrated that morphological awareness contributes to L2 English vocabulary knowledge through learner's lexical inference ability. In addition, the results revealed that morphological awareness makes no significant unique or direct contribution to L2 reading comprehension. It seems that the findings in this research contradict the findings in their study in 2013. The reason for the contradiction is that for elementary children, the reading test is much easier than those for advanced EFL learners. Children can easily find the answer to the questions just according to the literal meaning of the words. So that children can finish the task of reading comprehension if they have strong morphological awareness. However, morphological awareness is less effective when graduate level readings require comprehensive reading ability, such as higher level critical thinking or problem solving (see Table 10).

TABLE 10
EXAMPLES OF READING COMPREHENSION FOR ELEMENTARY SCHOOL STUDENTS AND GRADUATE STUDENTS

text	
Elementary school level	Hard by a great forest dwelt a poor wood-cutter with his wife and his two children. The boy was called Hansel and the girl Gretel. He had little to bite and to break, and once, when great dearth fell on the land, he could no longer procure even daily bread ("Hansel and Gretel," n.d.).
Graduate level	The presence of such surviving crudities does not evidence in the poet any essential brutality, but there is, in the strained and luxuriant pathos of his writing, and element of cruelty, or aesthetic sadism (Sommers, 1960).

VI. CONCLUSIONS AND IMPLICATIONS

The Chinese pinyin system is an alphabet system which is based on the Roman alphabet used for English. Chinese pinyin is an ideal instrument for Chinese elementary school students to learn Chinese characters. Chinese pinyin is also a bridge to English language learning due to the universal phonological principles (Lin et al., 2010; Shu, Anderson, and Wu, 2000; Wang, Perfetti, and Liu, 2004). On the one hand, Chinese children's phonetic awareness develops throughout school (Shu, Anderson, and Wu, 2000); on the other hand, among the basic 3,000 Chinese characters, 80%-90% of the characters are compounds of phonetic and semantic components (Lin et al., 2010). Thus, together with the universal phonological principles, the practice of pinyin in the first three elementary school years develops a foundation of phonetic awareness for future L2 English learning. Because the pinyin system is the basic component of the Chinese language, all Chinese students are familiar with it, and this point can be seen as an advantage for Chinese EFL learners. In other words, Chinese EFL learners know and encounter the twenty six Latin letters frequently before they plan to learn English. In contrast, Korean and Japanese, logographic languages, do not have similar advantages in the process of L2 English learning. Therefore, Chinese EFL learners should be confident and take an optimistic attitude toward English language learning. Chinese EFL teachers should explain such advantages to Chinese EFL learners in order to

help them to develop confidence in L2 English learning. Consequently, L1 Chinese transfer on L2 English learning is supported and illustrated in the examples of the pinyin-based phonetic awareness.

The semantic and phonetic compounds form the majority of Chinese characters (Shu and Anderson, 1997; Shu, Anderson, and Wu, 2000). Furthermore, the majority of Chinese words are compounds made up of two or more characters (Shu and Anderson, 1997). It is well known that most of the English words can be understood in parts from their roots, prefixes, and suffixes. Thus, when we consider the structure of English words and Chinese words, a universal morphological principle appears in our minds. Expanding the role of pinyin and phonetic awareness in Chinese language, the morphological principles in Chinese and English allow Chinese EFL learners to have a sense of success and confidence in their English language learning. When Chinese EFL learners begin to learn the basic English words, they will find that it is not very hard to learn English because they can utilize their prior knowledge of Chinese morphological principles effectively. Thus, the second urgent task for Chinese EFL teachers is to tell the EFL learners to apply the Chinese morphological principles to English learning.

The research results from Hamada and Koda (2011) indicate that although English is an alphabetic language and Chinese is a logographic language, there is no difference in meaning-inference performance between L1 alphabetic background students and L1 logographic background students. This result increases confidence and hope for Chinese EFL learners. In other words, the prior knowledge of the Chinese language in terms of phonology and morphology contributes to Chinese EFL learners' advantages in English language learning (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010; Brown, 2014; Nilson, 2010). Further, the logographic feature of Chinese is not an obstacle to Chinese EFL learners. The proper strategy should be as follows: forget the negative influence of L1 logographic language, then focus on the positive components of your L1 language.

Both phonological and morphological researchers in L1 Chinese transfer on L2 English learning emphasized that lexical exposure and extensive reading are the best ways to improve EFL learners' English comprehension (Shu & Anderson, 1997; Zhang & Koda, 2013). Zhang and Koda (2011) confirmed that for advanced EFL learners morphological awareness does not make a direct contribution to their reading comprehension. This result indicated that intense and extensive reading is more effective than developing word knowledge and vocabulary. This emphasizes the transformation of English learning strategies from in-depth vocabulary comprehension to extensive reading practice.

Recent researchers in neuroimaging analyzing Chinese-English bilingual adults revealed that reading Chinese contributes to heightened activation in some brain areas for visual-spatial analysis. Additionally, the research indicated that reading Chinese involves both left and right occipital activation, whereas reading English involves only left occipital activation (Wang, Perfetti, and Liu, 2004). This result indicates that Chinese EFL learners have activated more areas of their brains before they begin to learn English. In contrast, learning English uses fewer parts of their brains. Therefore, for Chinese EFL learners, learning English could be easier. Moreover, recent research in neuroscience, biology, cognitive psychology and educational psychology confirmed that visual approaches such as concept maps (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010; Brown, Roediger III, & McDaniel, 2014; Doyle, 2013) are effective for learning. Chinese EFL learners have learned in the best way since birth because of the primary feature of Chinese: a total visual language. Therefore, it is reasonable for Chinese EFL learners to conquer English if they put forth considerable effort and use effective strategies in their English learning. In other words, based on this research, English is conquerable for each and every Chinese EFL learner.

There were limitations to this study. First, eight journal articles were analyzed. This number was sufficient for conducting a reasonable literature review, but it was not very large. If I had added more articles from more journals concerning the relation between Chinese and English from the phonological and morphological aspects, the current research would have been more valuable for generalization. Second, this review was conducted from two aspects, phonology and morphology without syntax or text linguistics. The results would have been more fruitful and more trustworthy if we had interviewed more articles from more aspects. In addition, during this research, I did not use China's biggest academic search engine CNKI for more relevant articles. How to explore L1 Chinese transfer on L2 English and apply such research to English learning is a continuous topic for future research.

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