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The Cross-Linguistic Transfer of Chinese Phonological Awareness to English Phonological Learning Among Fifth-Grade Primary School Students

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Abstract. Language awareness constitutes the core cognitive basis for students' bilingual comprehensive and the progression of their reading and writing proficiency, and is of vital importance to primary school students' English learning. Primary school is a critical stage when students' English learning habits gradually take shape and stabilize. It is also the period when the transfer of Chinese is most concentrated and obvious; if not corrected in a timely manner, it will exert a profound and lasting impact on their future English learning. Previous relevant studies have mostly focused on students in junior high school and high school, with rare investigations into the cross-language transfer of Chinese language awareness among primary school students, as well as the correlation between Chinese pinyin proficiency and such cross-language transfer. Therefore, this study is of significant research value. With 112 fifth-grade students as research subjects, this study adopted standardized phonetic tests and pronunciation assessment instruments to explore the positive transfer and negative transfer of Chinese language awareness in English phonetic learning, and the correlation between Chinese pinyin proficiency and cross-language transfer. It aims to provide theoretical and practical references for English phonetic teaching in primary schools.

Keywords: Cross-linguistic transfer, English phonological awareness, Chinese pinyin proficiency, Language awareness, Primary school students

1. Introduction

Phonological awareness, the ability to identify and manipulate the sound structure of spoken language, is recognized as one of the strongest predictors of later literacy outcomes among children [1], making it a critical focus for research and educational practice. Recent research has shown that the English phonological awareness of Chinese primary school students develops unevenly across different phonological units [2]. For Grade 5 Chinese students, their well-established and entrenched Chinese phonological awareness exerts significant cross-linguistic interference on the growth of second language sound-related skills [3]. My research focuses on fifth-grade Chinese primary school students and explores the comprehensive cross-language influence of their stable Chinese phonological skills on the formation and progression of English phonological abilities.The study

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aims to address two core research questions: Firstly, what specific positive or negative effects does the deeply ingrained Chinese phonetic awareness have on the development of students' English phonetic skills at different phonetic unit levels? Secondly, which targeted teaching strategies can exert positive transfer advantages and weaken negative transfer interference? This study employs a quantitative method, combined with standardized phonetic awareness tests and standard oral language tests, to analyze and collect empirical data. It will supplement empirical data on the development of phonetic awareness among fifth-grade English learners, providing a clear factual basis for subsequent related research, and also helping educators accurately grasp the current development status of students' dual phonetic awareness, laying the foundation for formulating more targeted English phonetic teaching plans based on students' actual ability levels.

2. Methods

2.1. Participants

This study selected 112 fifth-grade students from two public primary schools as participants, aged between 10 and 11 years old. All participants had received more than five years of formal Chinese and English classroom instruction, with no language development disorders, reading disabilities or other special learning difficulties. In addition, their daily English learning duration and teaching materials were completely consistent, ensuring the homogeneity of the research sample.

2.2. Research instruments

Combined with the cognitive characteristics of fifth-grade students, this study compiled two independent 100-point standardized test papers, namely the L1 Phonetic Skills Test and the L2 Phonetic Skills Test, with reference to the empirically verified classic phonological awareness assessment paradigms in core journals at home and abroad. The design of both test papers strictly relies on mature existing research methods to ensure the reliability and validity of the test tools.

2.2.1. L1 phonetic skills measurement

This structure of this assessment was developed from the multi-dimensional native language sound structure evaluation method proposed by Zhou, Xie & Wu [4]. in Acta Psychologica Sinica, which is a recognized mature assessment paradigm in the field of children's Chinese phonological awareness research in China. The test paper covers four core dimensions: syllable awareness, initial consonant awareness, final vowel awareness, and tone awareness. It is administered orally, with trained examiners reading test items in standard Mandarin, and participants responding orally. Scoring is based on the item score value, with a full score of 100 points. The test aims to comprehensively assess participants' mastery of Chinese phonological awareness at all dimensions and verify the overall development status of Chinese phonological awareness in fifth-grade students.

2.2.2. L2 phonetic skills measurement

This measure developed from the English phonological awareness assessment scale for Chinese primary school students developed by Ma, Chen & Yang [2]. published in Studies of Psychology and Behavior, and is optimized according to the English phonological learning characteristics of Chinese learners. On the basis of conventional assessment tasks of basic syllable awareness and rhyme awareness, the test takes the contrast of five groups of high-confusion phonemes in English

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learning for Chinese students as the core assessment content, including /w/ vs /v/, /θ/ vs /s/, /ɪ/ vs /e/, /ts/ vs /dz/, /m/ vs /n/. These phonemes are significantly affected by mother tongue negative transfer and are typical pronunciation difficulties for students. The test adopts a combination of listening discrimination, oral pronunciation and written response, with a full score of 100 points. It focuses on assessing students' overall English phonological awareness level, and simultaneously calculates the response error rate of the five groups of confused phonemes to clarify the core difficulties in students' phonological learning.

2.3. Test procedures

All tests were conducted in quiet and independent classrooms, and all examiners received unified standardized training to ensure the standardization of the test process. Each participant completed the two test papers in sequence: L1 Phonetic Skills Measurement lasted 40 minutes, and L2 Phonetic Skills Measurementlasted 45 minutes, with a 10-minute rest interval between the two tests to avoid fatigue affecting students' response performance. Participants' oral responses were recorded in real time throughout the process, and written test papers were collected uniformly. Subsequent scoring was carried out in strict accordance with the preset scoring standards to ensure the objectivity and accuracy of the data.

2.4. Data analysis

SPSS 26.0 statistical software was used for data processing and analysis, and the specific analysis contents are as follows: (1) Descriptive statistics were conducted on the total scores of the two test papers to sort out the overall development level of participants' L1 and L2 sound processing skills; (2) According to the response data of confused phonemes in the L2 Phonetic Skills Measurement, the number of error students and the error rate of each group of phonemes were calculated to analyze students' phonological learning difficulties; (3) A univariate linear predictive analytic model was established with the score of the Chinese phonological awareness test as the independent variable and the score of the English phonological awareness test as the dependent variable to verify the correlation between the two.

3. Results

The tables present the key findings of the study, focusing on the overall performance of fifth-grade students in l L1 and L2 sound processing skills. The results describe the basic developmental level of participants' phonological processing abilities in both L1 and L2, and further clarify the complex mechanisms of cross-linguistic transfer, including positive transfer from native language phonological foundations and negative transfer interference caused by L1 phonological rules.

3.1. Chinese phonological awareness scores

Table 1 shows the score distribution of Chinese phonological awareness across the 112 participants.

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Table 1. Overall scores of Chinese phonological awareness (N = 112)

Score grade	Score Range	n	Percentag(%)	Mean Score	SD
Excellent	85-100	76	67.86	90.20	4.36
Good	70-84	30	26.79	76.50	3.82
Poor	≤ 69	6	5.35	62.30	2.15

Note: The majority of fifth-grade students achieved high scores in Chinese phonological awareness, indicating a solid and well-developed foundational phonological processing ability in their native language.

3.2. English phonological awareness scores

Table 2 presents the overall distribution of English phonological awareness scores.

Table 2. Overall scores of English phonological awareness (N = 112)

Score grade	Score Range	n	Percentage(%)	Mean Score	SD
Excellent	85-100	65	58.04	88.72	5.11
Good	70-84	34	30.36	77.41	4.27
Poor	≤ 69	13	11.60	64.23	3.99

Note: Overall English phonological awareness levels were high, but scores exhibited greater variability than Chinese scores, reflecting the difficulty of second language phonological processing.

3.3. Error rates of high-confusion English phonemes

Table 3 reports the error rates for five typical English phoneme contrasts that are prone to confusion among Chinese learners.

Table 3. Error rates of typical English phoneme contrasts (N = 112)

Index	Phoneme Contrast	Total Responses	Error Rate
1	/w/ vs /v/	112	54.00
2	/θ/ vs /s/	112	41.96
3	/ɪ/ vs /e/	112	34.82
4	/ts/ vs /dz/	112	27.68
5	/m/ vs /n/	112	21.43

Note: The highest error rate reaches 54.00% for /w/–/v/, and the overall average error rate of the five phoneme contrasts is 35.98%, which proves the significant negative transfer effect of Chinese mother tongue on English phonological learning.

4. Discussion

4.1. Overall interpretation of research findings

This study focused on the dual transfer effect of Chinese phonological awareness on English phonological learning, using 112 fifth-grade primary school students as the subjects. By combining three sets of empirical data, it verified the positive transfer of general phonological cognitive ability and the negative transfer caused by specific phoneme interference. The results showed that the

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students' overall performance in Chinese phonological awareness was excellent, and they simultaneously experienced both positive and negative transfer in their English phonological acquisition [5]. That is to say, the native language habits will exert both promoting and interfering effects on the acquisition of a second language.

4.2. Positive transfer of L1 phonetic manipulation capacity

From the data in Table 1 and Table 2, it can be seen that students' overall level of Chinese phonetic awareness is high, and it has a significant positive correlation with the score of English basic phonetic awareness. This positive transfer stems from the commonality of cross-language phonetic cognitive mechanisms. Neurological evidence supports that Chinese phonetic awareness positively promotes English phonetic processing [6]; cross-language positive transfer is stable. In the study, it was confirmed that phonetic awareness is a domain-general cognitive skill. The ability of syllable segmentation and phonetic sensitivity formed during native language learning can be directly transferred to the phonetic processing of a second language. Combined with the research of Zhou et al. [6] on Chinese children's phonological awareness, upper-grade primary school students have fully mastered Chinese syllable, initial and final awareness, and this mature native phonological ability provides a cognitive foundation for English phonological learning. Ma et al. [2] also pointed out in their study of Chinese primary school students' English phonological awareness that the positive transfer of Chinese phonological awareness can effectively reduce the difficulty of English basic phonological tasks such as syllable counting and rhyme judgment, which is highly consistent with the results of this study.

4.3. Negative transfer of L1 phonetic manipulation capacity

The data in Table 3 demonstrates that the error rates of /w/ vs /v/ and /θ/ vs /s/ are as high as 54.00% and 41.96% respectively, which is a typical manifestation of mother tongue negative transfer. It is proposed that negative transfer mainly occurs in the parts where the mother tongue and the second language have phonetic differences, and learners will unconsciously substitute native language phonetic rules for second language pronunciation [7]. The core cause of negative transfer in pronunciation lies in the substitution of L1 phonemes that are similar to the target language due to the phonetic differences between Chinese and English [8]. In the Chinese phonetic system, there are no phonemes such as /θ/ and /v/, so students tend to substitute them with similar Chinese phonemes /s/ and /w/. Mandarin permits nasal codas only as /n/ and /ŋ/, with no word-final /m/ in its phonotactic system at all, while English allows /m/ to appear freely in word-initial, medial, and final positions [9]. Due to this critical cross-linguistic phonotactic difference, Chinese learners are deeply affected by negative transfer, and tend to transfer their L1 phonological constraints into English phonetic production: they often insert a schwa /ə/ after word-final /m/, substitute it with the familiar nasal /n/ in Mandarin, or simply omit the final /m/ entirely [10]. This also fully explains why students with excellent Chinese phonological awareness still have a high error rate in confusing English phonemes. The more proficient one is in their native language, the more obvious the phonetic fossilization phenomenon is in the production of second language pronunciation [10].

4.4. Teaching implications

The dual transfer effects revealed in this study have important practical significance for primary school English phonetic teaching. On the one hand, teachers should give full play to the positive

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transfer of L1 phonetic manipulation capacity, connect the common phonological rules between Chinese and English in classroom teaching, and consolidate students' English phonetic foundation by virtue of their mature native phonetic ability [8].

In particular, Lü et al. [11] pointed out that Chinese syllable awareness formed in L1 acquisition can significantly promote English word reading and phonological processing. Therefore, in classroom practice, teachers can adopt a syllable splitting method that starts from the segmentation training of Chinese monosyllabic words, and then transfers this skill to the analysis of English monosyllabic words. By guiding students to apply their mastered L1 syllable structure rules to English phonological learning, they can quickly grasp the phonetic structure of English words and reduce the learning burden of pronunciation.

On the other hand, targeted training should be carried out for high-confusion phonemes with serious negative transfer, such as strengthening contrastive pronunciation practice and listening discrimination of /w/ vs /v/,/m/vs/n/ and /θ/ vs /s/, to break the solidification of mother tongue phonetic habits.

5. Conclusion

This study examined the dual transfer effects of Chinese phonological awareness on primary school students' English phonetic development. Results confirm that students with stronger Chinese phonological awareness exhibited significantly better English phonetic awareness and more accurate pronunciation. In addition, English words with sounds similar to Chinese Pinyin, such as pen, man, dog, leg, and ten, were mastered much more easily and with higher accuracy, as shared phonetic features effectively reduced learning difficulty.

However, obvious negative transfer occurred in English phonemes and structures absent in Mandarin, such as /θ/, /v/, and word-final /m/, where students frequently substituted similar native sounds and produced persistent errors.

To improve teaching practice, instructors should fully leverage positive transfer by connecting common phonetic rules between Pinyin and English, using syllable-splitting activities and comparative drills to help students build confidence. Meanwhile, targeted training must be implemented for confusing phonemes through minimal-pair practice, listening discrimination, and repeated imitation. Teachers should also emphasize the correct production of word-final nasals to avoid interference from L1 phonological habits.

In conclusion, Chinese phonological awareness serves as both an advantage and a constraint. By reasonably using cross-linguistic commonalities and specifically addressing differences, teachers can help students establish a stable and accurate English phonetic system on the basis of their native language competence.

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