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# The Prosodic Role in English Production of Native Mandarin Children: A Systematic Review Proposal

**Chuanqi Sun[1a*#] and Sihan Chen[2b#]**

[1]College of International Languages and Cultures, Hohai University, Nanjing 210024, China
[2]Changzhou Senior High School of Jiangsu Province, Changzhou, 213003, China
a. 3071159522@qq.com, b. JuliaChensczap23@outlook.com
*corresponding author
#co-first authors

**Abstract:**

English, as the most widely used language globally, is increasingly valued by parents and educators. In China, a growing number of children choose English as their second language for learning after being able to use Mandarin relatively proficiently. Mandarin speakers, learning English may face many challenges, one of which is that native Mandarin speakers find it difficult to speak English naturally like native English speakers. Some scholars believe that the disparity in prosodic features between Mandarin and English is one of the key factors causing this difficulty. Compared to adult learners, children have an unstable prosodic development system, resulting in significant differences in language acquisition. Therefore, understanding the relationship between the prosodic features of Mandarin-speaking children and their English production is crucial. From the perspective of structure and purpose, this paper Outlines a systematic literature review framework, hoping to summarize the previous articles on the role of prosody in the English production of Mandarin speaking children, and provide some useful results that can help people in this field to improve their work. From the perspective of content, in this systematic literature review, we are going to propose and solve two questions: (1) Does the prosody of Mandarin influence Mandarin-speaking children's English production? (2) If the influences do exist, what are the specific influences? To solve these two questions, we first search some articles with the searching strategies that we design. Then we plan to screen the articles that we get from searching with the inclusion criteria and the exclusion criteria that we design. Finally, we plan to use quantitative analysis to analyze these samples and give the eventual result.

**Keywords:** prosody; Mandarin-speaking children; English production; second language acquisition; cross-linguistic influence.

## 1. Introduction

### 1.1 Background

With the rapid advancement of the globalized society, countless educators and parents are increasingly emphasizing English education for their children to provide them with broader employment opportunities in the future. However, because of the limit education resource, most children who receive English language education cannot communicate with a real native English-speaker. Thus, they do not have the opportunities to observe how the native English-speakers speak, and they cannot improve their English production step by step by contacting with the native English-speakers. Moreover, though some Mandarin-speaking children may have the opportunities to communicate with the native English-speakers frequently, they will still retain some characteristics of Mandarin when they speak English. To be specific, Prosody, consisting of stress, rhythm, and intonation, plays a crucial role in language acquisition [1]. However, in China, English oral teaching often places more emphasis on the acquisition of vowel and consonant pronunciation, while neglecting the influence of Mandarin prosodic functions and features on English acquisition, which is a key factor affecting the naturalness of English learners' oral English [2].

### 1.2 Literature review

#### 1.2.1 The comparison of prosodic features in Mandarin and English

There are significant differences in prosodic features between Mandarin and English. Firstly, Mandarin is a typical tonal language [3]. Specifically, Mandarin uses four lexical tones (T1-T4) to change the meaning of syllables realized through different pitch contours, among which T1 is a high-level tone, T2 is a rising tone, T3 is a falling-rising tone, and T4 is a falling tone [4]. In addition, Mandarin exhibits a syllable-timed rhythm, where syllables are roughly equally spaced in time. In contrast, the timing of English is stress-based, meaning that stressed syllables are distributed at roughly equal intervals, regardless of how many non-stressed syllables are in between [2]. Stress in Mandarin does not function in the same way as it does in English. While Mandarin does have stress, it is not as prominent or as phonemically significant as it is in English. In Mandarin, stress can affect the tone of a syllable, but it does not usually change the meaning of words in the way it can in English [5]. Finally, duration in Mandarin is often associated with the length of vowels within syllables, which can also be influenced by tone [6].

### 1.2.2 Prosodic challenges for Mandarin-speakers learning English

For native Mandarin speakers who learn English as a second language, great challenges in oral English may occur due to these distinct differences in prosody between Mandarin and English [2]. Through an experimental study, Li and Post [7] investigated these challenges by analyzing the prosodic characteristics of speech rhythm in English among Mandarin speakers and compared them with native English speakers. They particularly focused on Lengthening Effects and Rhythm Metrics and found that Mandarin speakers and native English speakers exhibit both similarities and differences in these two aspects. First, there was a significant degree of lengthening in syllables in English, particularly in accented syllables, which was evident both in non-final and final positions, with accented phrase-final syllables showing the most pronounced lengthening compared to Mandarin. Meanwhile, there are similarities in final lengthening exhibited both in English and Mandarin, but this effect was more pronounced in English, while Mandarin speakers showed less pronounced final lengthening when producing English. Finally, Mandarin speakers showed a similar developmental pattern to native English speakers in acquiring vocalic variability and accentual lengthening. However, there were notable differences in the proportion of vocalic material in their L2 utterances, suggesting a direct influence from their L1. These findings implicated that Mandarin speakers may retain certain characteristics of their L1, such as less final lengthening, and different proportions of vocalic material in their English oral production.

### 1.2.3 The Impact of Mandarin Prosody on Children's English Production

Regarding duration, children aged 4 to 6 may exhibit more uniform syllable length in English due to the influence of Mandarin, where syllable timing is more consistent. In contrast, English relies on varied syllable length based on stress, and this difference can lead to English speech that sounds overly segmented, as if each word is being pronounced separately rather than as part of a fluid sentence [8].

Additional research paid attention to the interference of Mandarin prosody in English production related to children. Mandarin-speaking children tend to use a syllable-timed rhythm instead of the stress-timed one in their English speech [2]. They also exhibit difficulties with English stress placement and intonation and this interference is further complicated by the different functions of pitch in Mandarin and English. For instance, Chung et al. [1] discovered that English rhyme awareness accounts for more unique variance in English word reading and decoding than English stress perception and production does.

### 1.2.4 Age effects on prosodic development

Regarding the development of prosodic features, different age groups exhibit different developmental dynamics. Prosodic features are gradually acquired throughout childhood. Taking Mandarin-speaking children as an example, according to Yang and Chen [8], children aged 4-5 who speak Mandarin as L1 generally learn to use pitch and duration clues to differentiate between focal and non-focal elements in speech, much like adults. However, they are not able to utilize pitch cues fully adult-like, particularly in terms of specific lexical tones. When it comes to distinguishing between narrow focus and wide focus, children typically achieve adult-like proficiency at the age of 11. In addition, the development of rhythm awareness continues throughout early childhood and fourth grade [9]. Previous studies have shown that children's prosodic system experiences an unstable process, which is in stark contrast to adults, whose prosodic patterns are typically more stable and therefore less likely to undergo significant changes in second language acquisition. Thus, children's prosodic system has high plasticity, making it easier for them to absorb new pronunciation and prosodic features when learning a second language than adults [10-11].

Additionally, the age of acquisition has been identified as a strong predictor of foreign accent rating in L2 English [12]. Their study found that immigrants who start learning English before the age of six typically do not exhibit a foreign accent, while immigrants who start learning after the age of thirteen exhibit a distinct foreign accent. This indicates that there could be a critical period for acquir-

ing native-like prosody in second language learning [12]. There are other studies supporting this idea, including research conducted by Johnson and Newport ([10]) which demonstrated a clear critical period effect for second language acquisition. Furthermore, DeKeyser [11] shows that while some adults can achieve near-native proficiency, they tend to have high verbal analytical ability, indicating that explicit learning mechanisms may compensate for the lack of an optimal critical period.

Overall, research on the prosodic role of Mandarin-speaking children and their English production is very scarce and scattered. Indeed, some studies have explored various aspects of prosodic transfer and development [7-8], the overall scale of work is relatively small, and the themes are quite diverse. For example, some studies have examined the influence of Mandarin prosody on the position and intonation of English stress [1], while others have focused on the developmental dynamics of prosodic features in Mandarin-speaking children [8]. Currently, there is a lack of comprehensive and systematic analysis to specifically illustrate the impact of Mandarin prosody on English production in children whose native language is Mandarin. This indicates that it is highly necessary to conduct a systematic literature review on specific prosodic features and cross linguistic prosodic conversion mechanisms that affect English production. Therefore, we plan to present an overview and critically reflect on the impact of Mandarin prosody on English production in Mandarin-speaking children.

### 1.3 Research questions

Two questions will be addressed in the systematic review:

(1) Whether Mandarin prosodic features affect children's L2 English production?

(2) If the influences do exist, what are the specific influences?

## 2. Methodology

### 2.1 Search strategy

In this study, five academic databases were used for the systematic retrieval of literature related to the topic, including EBSCO, ERIC, Web of Science, ProQuest and PubMed. The selection of these databases is based on their comprehensive coverage in the fields of linguistics, education, psychology, and medicine, ensuring broad and inclusive searches. The initial keywords used for the search were "prosody" OR "intonation" OR "stress" OR "rhythm" AND "English" OR "second language" OR "L2" AND "Mandarin-speaking children" OR "native Mandarin children". These keywords are selected to ensure that all articles related to Mandarin/English prosody (fundamental components including stress, rhythm, and intonation; [2]) features and Mandarin children's prosody acquisition characteristics in the selected database can be retrieved. Furthermore, the use of "OR" in search strategy ensures that articles containing any keywords can be captured, which can highly improve the comprehensiveness of the search.

After searching with the keywords, we collect the searching results into Table 1 to make the results look clear. Among them, rows represent the relationship of "OR". Taking the words listed in the first column as an example, the search terms for the target population include: "children" OR "child" OR "preschool" OR "nursery" OR "kindergarten" OR "elementary school" OR "primary school" OR "student". These terms are selected to capture a wide range of ages and educational settings, ensuring that the systematic review includes a diverse group of Mandarin-speaking children. Meanwhile, "Not Terms" were added to exclude articles unrelated to the research topic. For example, "stress" also refers to a noun widely used in the medical and engineering field, so relevant medical literature needs to be excluded. Additionally, articles exploring music rhythm will be excluded. Also, many previous studies on children's prosody have focused on atypical developmental children (such as autistic children, deaf children, etc.). However, this systematic review only targets typical developmental children to improve the universal applicability of research results, so such articles need to be excluded. Therefore, articles that do not meet these criteria are excluded to maintain attention to the target audience.

Finally, we got the searching result and listed the number of literature we obtained from various databases in Table 1.

**Table 1 Searching Results**

| Database | EBSCO | ERIC | Web of Science | ProQuest | PubMed |
|---|---|---|---|---|---|
| The number of the papers | 0 | 9 | 0 | 484 | 8 |

### 2.2 Screening

To ensure that the systematic review is sufficiently valid, rigorous, and focused, we have established strict criteria to identify studies that will be analyzed in the future systematic review. The final inclusion and exclusion criteria are totally presented in Table 2.

**Table 2 Incusion Criteria**

| Inclusion Criteria |
|---|
| Studies published between January, 2014 and August 8, 2024 |
| Scholarly articles that underwent peer review |
| Studies employing empirical methodologies |
| Studies presenting findings based on data analysis |
| Participants are typically developing children who primarily speak Mandarin and also possess proficiency in English |
| Articles written in English and Chinses |

According to Table 2, we only select the articles from January 2014 to August 2024 because the research findings reflected both the fieldwork affordances of modern technology and the contemporary impact of high-stakes testing. The reason for us to choose peer reviewed articles is that these articles have higher quality, and they are well worth a systematic literature review. Additionally, children diagnosed with developmental disorders, such as cochlear implanted children and autistic children, often face unique challenges in language acquisition. For example, children with Autism Spectrum Disorder (ASD) face subtle but significant challenges at the interfaces of grammar with pragmatics and prosody [13]. By focusing on typically developing children who learn Mandarin as their first language and English as a second language, potential confounding variables related to atypical development can be minimized, and thus common language acquisition patterns can be discovered. Moreover, both English and Chinese articles will be included in the review to cover sufficient studies relevant to the correlation between prosody and English acquisition in Mandarin Children.

In this step, we intend to use Covidence (a software for screening) to assist us in literature screening. After strictly following the inclusion and screening criteria to read the abstracts or full texts of the retrieved articles, we will employ Covidence to summarize the screening results by selecting one of “included”, “excluded”, or “rediscussed” for each article. (The “included” vote indicates that the article meets the inclusion criteria. The “excluded” vote means that the article does not meet the inclusion criteria. The “rediscussed” vote represents that the article requires additional consideration based on its specific research content). After the above work is completed, we will determine the final article that will be systematically reviewed based on the screening results of all literature generated by Covidence.

A quantitative review method will be adopted to synthesize all the identified articles. Firstly, we will standardize the data extracted from the article to ensure the comparability of data from different studies. Specifically, we will systematically extract information such as sample size, participants, research design, and major findings for comparative analysis. Then, we plan to conduct a meta-analysis based on these data using a range of statistical software tools such as Comprehensive Meta-Analysis (CMA) and Review Manager (RevMan). The statistical analysis will involve calculating pooled effect sizes, conducting subgroup analyses, and assessing publication bias. We will also explore heterogeneity across studies using measures such as $I^2$ statistics and chi-squared tests. This work will enable us to evaluate the overall impact of rhythm on the English proficiency of Mandarin-speaking children.

In the next step, the results of the data analysis will be presented through charts and tables for easy interpretation and visualization. For instance, forest plots and other graphical representations will be applied to display the effect size, confidence interval, and joint effect size of individual studies while the funnel plot will be used to visually evaluate publication bias.

# 3. Conclusion

## 3.1 Process Summary

This proposal aims to provide a systematic research plan for a systematic literature review on the topic of “The Influence of Rhythm on English Production in Mandarin-Speaking Children”. Firstly, we wrote an abstract of this proposal, making a brief introduction of my proposal. Next, the introduction summarizes previous research and emphasizes the shortcomings of this field, highlighting the necessity and importance of our future systematic literature review. The methodology section provides a detailed introduction to structured methods for conducting systematic literature reviews. This includes a comprehensive search strategy that includes relevant databases such as PubMed, ERIC, etc. We have identified appropriate search terms and inclusion and exclusion criteria to ensure inclusivity and relevance. We will use a quantitative review method to extract data from the articles, processing and analyzing it. Ultimately, the results of our systematic

review will be presented in the form of tables and charts. Overall, this proposal provides a framework and introduction for our future research. We will strictly follow the contents of the proposal to complete our systematic literature review in the future.

### 3.2 Limitations

There are still some limitations in our study. Prosody is not very popular in the relevant area. Specifically, when researchers want to figure out what characteristic of Mandarin will impact Mandarin-speaking children's English production, most of them will not choose "Prosody" as their research factor. In addition, we design a very specific topic. Thus, it is hard for us to find enough articles that related to our topic. Because we lack enough samples, the result in our systematic literature review may not be generalize well.

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