

Phonological Transfer from Cantonese to English for Cantonese-English Bilingual Children: A Scoping Review

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Abstract

The English acquisition of Cantonese-English bilingual children has emerged as a prominent research focus within the field of bilingual studies. This study aims to explore the characteristics of Cantonese ESL (English as a Second Language) children by examining Cantonese-English bilingual children as subjects. Specifically, three main research questions are addressed: whether Cantonese influences the English learning of Cantonese-English bilingual children, how Cantonese impacts English learning, and what the resulting effects are. To conduct this investigation, a scoping review research method was employed to gather relevant studies on the topic. Five significant studies were selected and analyzed to examine the English learning characteristics of Cantonese-English bilingual children and the influence of Cantonese on their English acquisition process. Throughout the scoping review process, various comparisons were made to highlight distinctions between the studies, aiding in answering the research questions posed in this study. Key findings indicate three primary types of influence from Cantonese to English: tone transfer, delayed acquisition of English lexical stress, and difficulty in acquiring speech rhythm.

Keywords: phonological transfer, Cantonese-English bilingual children, second language acquisition, tone, English lexical stress, speech rhythm

1. Introduction

Hong Kong English can be characterized as a variety of English strongly influenced by Cantonese, spoken by Cantonese-English bilinguals in Hong Kong. While both English and Cantonese are official languages in Hong Kong, English predominates in many societal domains. The majority of Cantonese speakers reside in Mainland China, with a significant population also found in Hong Kong. Additionally, sizable Cantonese-speaking communities exist in Australia, Britain, Canada, and the United States. In regions where Cantonese and English are both spoken, many children acquire both languages simultaneously, resulting in variations in their English compared to native English speakers.

Cantonese is a prototypical tone language, characterized by a rich tonal system, as noted by Hashimoto (1972). Changes in tone within a syllable can alter the meaning of words. Cantonese features six contrastive tones: high level, high rise, mid-level, low rise, low fall, and low level. The first tone, high level, maintains a stable high pitch throughout pronunciation. However, English is not a tone language; therefore, differences in tone only result in varying accents rather than changes in meaning. Instead, factors such as stress in syllables determine the meaning of English words.

English, as the second language of Cantonese-English bilingual children, mainly has two kinds of features: segmental features and suprasegmental features. Apart from segments in a language, suprasegmental features may greatly influence the meaning of words. One's linguistic experience in a first language will impact on their second language acquisition. When people communicate with each other, they use sounds to convey their thoughts. Sound and their individual pronunciation form segments of a language. The reason pronunciation varies for the same word is that people have accents, especially when their first language is not English. The pronunciation of words involves more than knowing how to pronounce exact syllables, it includes an organization that exists above the level of segmental, which is the suprasegmental level (Andrew, Martin, David, Harald, & Andrew, 2009).

The suprasegmental part of a language helps convey the meanings of the words, including stress, tone, intonation, and pitch which could be defined as prosodic phenomena (Andrew et al., 2009). Prosody, originally rooted in music and the modulation of voices in poetic recitation, encompasses the phonetic properties of speech and denotes the suprasegmental aspects of linguistics that exist above the segmental level (Andrew et al., 2009). Prosody encompasses various elements including loudness, pitch, stress, tempo, length, and rhythm. In this chapter, ‘prosody’ is defined as a non-segmental aspect of linguistics, particularly relevant in the domains of stress, tone, and intonation (William, 2015). Pitch constitutes a non-segmental component of speech sounds, influenced by various anatomical structures such as the vocal tract, lungs, larynx, oral cavity, and nasal cavity. Usually, speakers change the loudness or pitch of the sound to change the prosodic phenomena of a language. English speakers use lexical stress to convey different meanings of the words, while Cantonese speakers use lexical tone. Thus, phonological transfer which includes the transformation of prosodic features is worth researching.

As previously mentioned, the suprasegmental level of language plays a crucial role in pronunciation. Chan and Li (2010) assert that both segmental and suprasegmental levels can pose challenges for Cantonese learners of English in terms of pronunciation. However, many prior studies have predominantly focused on the segmental aspects of language. For instance, Li and Andrew (2012) conducted a study on students from various regions of China, concentrating on segmental features such as diphthong shortening and final consonant clusters in English. Furthermore, there is a notable dearth of research on the phonological development of children, particularly regarding suprasegmental features. Studies often use Cantonese ESL learners as subjects without adequately considering the impact of age (Zhang & Yin, 2009; Wang, 2011). Lenneberg’s hypothesis (1967, cited in Hugo, 1986) emphasizes the pivotal role of age, around 11, in language development for both monolinguals and bilinguals. Bloomfield’s suggestion (cited in Hugo, 1986) that young bilinguals may find it easier to acquire native-like pronunciation during childhood underscores the importance of understanding children’s phonological learning. Consequently, there exists a significant gap in research specifically addressing the phonological development of Cantonese ESL learners concerning age, as well as a lack of attention to suprasegmental features in previous studies. Hence, further investigation into the suprasegmental aspects of phonological learning, especially in child language acquisition and among Cantonese ESL learners, is warranted.

This study aims to investigate whether Cantonese influences the English learning process of Cantonese-English bilingual children, and if so, how this influence manifests. The study employs a scoping review method to gather recent research on Cantonese-English bilingual children and their acquisition of English phonology.

2. Method

Numerous methodological approaches are at one’s disposal for the purpose of conducting thorough investigations and acquiring pertinent information aimed at addressing research inquiries. These include but are not confined to, methodologies such as experimental research, survey research, and case studies, among others. Nevertheless, in light of time constraints, resource limitations, and this specific disciplinary domain under investigation, careful consideration has led to the discernment that the scoping review methodology emerges as the most appropriate research design for the principal phase of this study.

The step-by-step method proposed by Arksey and O’Malley (2005) was followed to collect relevant studies, chart the data, and summarize and report the results. In the area of phonological transfer from Cantonese to English, the primary objective of the methodology part is to investigate the most current studies and assess the extent, nature, and range of the research topic. Additionally, to summarize the research findings in the area of phonological transfer in Cantonese-English bilingual children in their process of learning two languages. Furthermore, the scoping review in this study is designed to identify gaps in the evidence base where no research has been conducted in this area.

2.1 Identifying the Research Question

Three research questions were articulated for this study as it is mentioned before.

2.2 Identifying Relevant Studies

In this stage, the path identifying the most relevant studies consists of using a specific search string in a range of relevant academic databases. Given the limited existing empirical and peer-reviewed literature on this topic, this study also included some ‘grey literature’, including studies found in Google Scholar. Taking all of this into consideration, the following electronic databases were employed as the main research platforms:

- 1) ERIC (EBSCOhost)
- 2) MLA International Bibliography & MLA Directory of Periodicals (EBSCOhost)

3) ProQuest Dissertations & Theses A&I (ProQuest)

4) Linguistics and Language Behaviour Abstracts (ProQuest)

To refine the search results as much as possible to the intersection of phonological transfer and Cantonese-English bilingual children subjects matters, three separate search strings were used for the database searches.

Key terms were selected manually. The following search steps were conducted. The first of these search strings was limited to the terms about phonology issues, such as phonological transfer, phonology, and transfer. The second search string included the constraints in this study which was that the first language of the sample should be Cantonese. The third search string was limited to the age of the sample in the studies, including children and infants. Quotation marks and asterisks were used as a need for each term to restrict or leave open the number of search results respectively as relevant. For example, “phonological transfer” is in quotation marks as it is a fixed acronym used within the field of phonology; whereas prosod* with an asterisk to allow for the different inflectional endings for the prefix “prosod”. All of the search terms in each string were connected by using the “OR” Boolean connector before the two strings were combined using the “AND” Boolean connector.

Table 1. Search terms used across electronic database

String 1	String 2	String 3	String 4
“Phonological transfer” OR	“Cantonese”	“Proso*” OR	Child* OR
		“intonation” OR	Infant*
		“Tone” OR	
		“Stress” OR	

2.3 Select Studies to Be Include in the Review

In this stage, the author used the software platform Covidence to organize the papers obtained from the last step and to apply inclusion and exclusion criteria to select studies to be included in the review. The search strings having been established, the initial set of studies was identified in each database and then imported into the Covidence software for data extraction. This step allowed the relatively large number of studies involved to be easily collected and reviewed systematically, with different stages of inclusion, exclusion and review being represented as different steps in the Covidence software. The initial set of studies includes a total of 50 entries drawn from the following database: ERIC (n = 5), LLBA (n = 40), Academic Search Complete (n = 5), and MLA (n = 1). These numbers do not include the 1 duplicate which was manually screened out from MLA.

At this stage, an initial observation for the title of the studies was done. After that, the initial set of entries which got into the Covidence for screening was 39. 11 studies were excluded because the target research area was not Cantonese-English bilingual, the age of the sample was not within the range of children, and the topics were about clinical issues.

The number of final sets of studies, which were targeted for title and abstract screening, was 33. This does not include the 6 duplicates which were automatically screened out upon importing into Covidence.

At this point, further inclusion and exclusion criteria were developed to form the basis of the decision to manually include or exclude studies at the screening and full-text review stages. These can be found below in Table 2.

Finally, there are many studies on the chosen database that focus on bilingual Children’s phonological development, however, some of them focus on those who have illnesses such as Hearing-Impaired, Deafened Cochlear Implantees.

Table 2. Inclusion & exclusion criteria

Inclusion Criteria	Exclusion criteria
Cantonese-English bilingual listener/speakers	Studies focus on multilingualism, Mandarin-English bilingualism or other forms of bilingualism.
Full text available in English	Studies conducted in Chinese, French, German and so forth.
Young bilingual, early bilingual, Children, and infant	Studies focus on Adult

As regards these criteria, the resources were manually screened by title and abstract to reduce their number to a level practical for full-text review. After this, a full-text review is organized, where the full contents of each study are evaluated for each of the remaining entries. This stage resulted in the elimination of a further 4 studies, the majority of them ruled out for not aiming at Cantonese-English bilingual children; in addition, some of them aimed at solving the clinical problems. An overview of these studies was then created by using Microsoft Excel, which was used to collate and chart the data, as well as identify several categories such as “research question”, “research method” and so forth. These will be discussed in chapter (results).

Because of the limited number of resources, more paths to finding resources should be explored. Therefore, I read through the resources available at the time and started with the authors of those studies to find more resources. By looking up the authors’ previous research, I found another resource that was relevant to this study, which is from Mok and Li (2014). Altogether five resources were needed to read through.

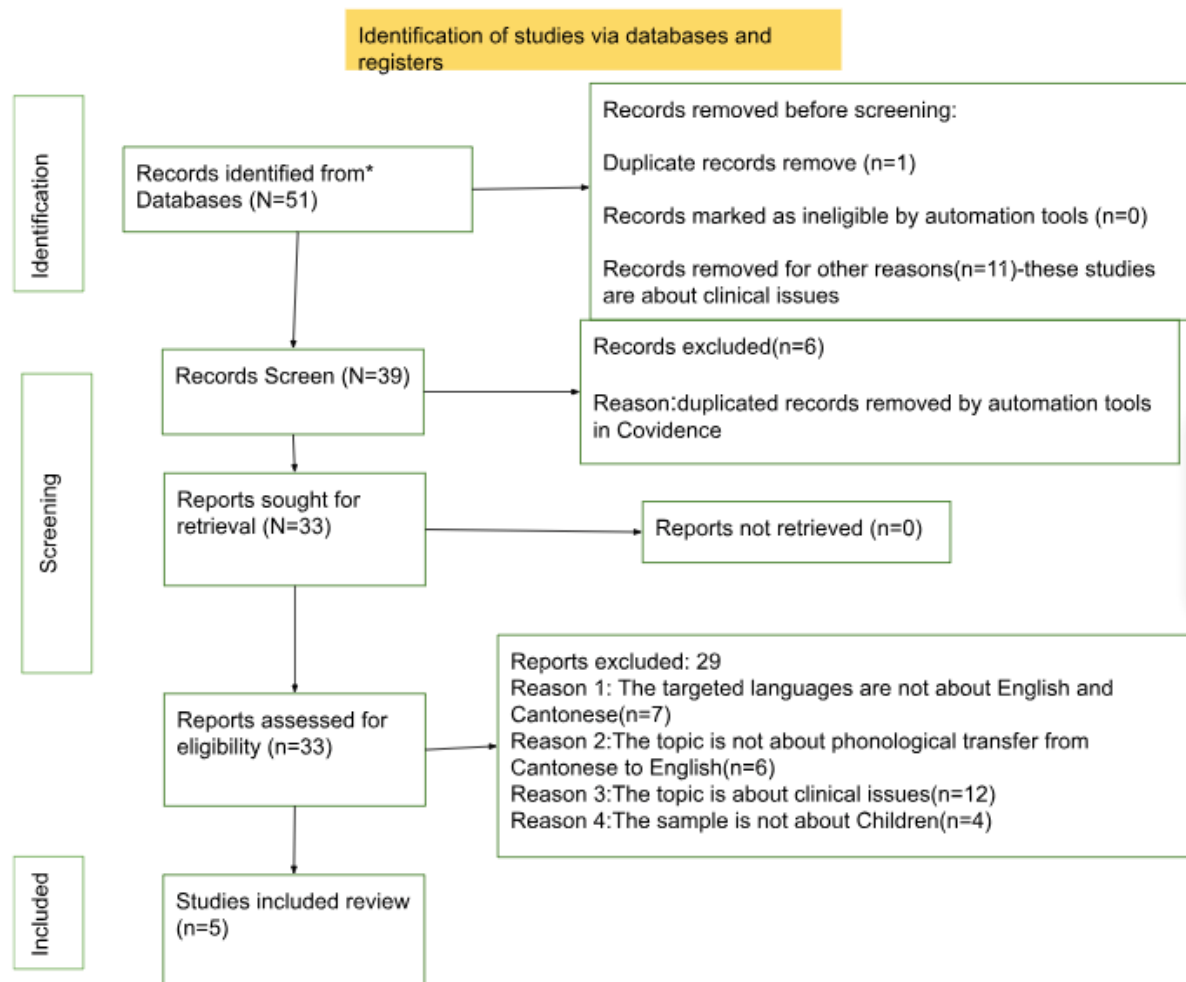


Figure 1.

3. Findings

This part will present the results of the scoping review. The studies selected as part of the scoping review will be presented in detail by using some charts, together with a detailed discussion of the result. After determining the final selection for the final review, a thematic analysis was used to facilitate the synthesis of the content of the selected studies and to identify the common lines of research among the multiple publications. In the following part, the thematic issues were identified, and presented in Table 3 along with the corresponding relevant research questions in each case.

Table 3. Scoping review result: List of studies with topic

Studies	Topic
Choi, W., Tong, X., & Singh, L. (2017). From lexical tone to lexical stress: A cross-language mediation model for Cantonese children learning English as a second language. <i>Frontiers in psychology</i> , 8, 492.	Study One: Tone Influence in English Phonological development
Li, J., & Mok, P. P. K. (2014). The acquisition of English lexical stress by cantonese-english bilingual children at 2; 06 and 3; 0. In <i>Proceedings of Speech Prosody</i> (Vol. 7, pp. 688–692).	Study Two: Speech rhythm acquisition for Cantonese ESL children aged 3
Mok, P. P. (2011). The acquisition of speech rhythm by three-year-old bilingual and monolingual children: Cantonese and English. <i>Bilingualism: Language and Cognition</i> , 14(4), 458–472.	Study three: Speech rhythm acquisition for Cantonese ESLchildren aged 2 to 6
Mok, P. P. (2013). Speech rhythm of monolingual and bilingual children at age 2; 6: Cantonese and English. <i>Bilingualism: Language and Cognition</i> , 16(3), 693–703.	Study Four: Tone influence in English lexical stress acquisition for Cantonese ESL children
Tong, X., He, X., & Deacon, S. H. (2017). Tone matters for Cantonese-English bilingual children’s English word reading development: A unified model of phonological transfer. <i>Memory & cognition</i> , 45, 320–333.	Study Five: English lexical stress acquisition for Cantonese ESL children influenced by Cantonese

Table 4. Scoping review result: Topic and research question or hypotheses

All of the selected studies are about how Cantonese influence English phonology acquisition for Cantonese ESL Children	Topic	Research question/hypotheses
	Study One: Tone Influence in English Phonological development	This research proposes two hypotheses to explain the transfer of phonological awareness between the two languages. The first hypothesis is the prosodic transfer hypothesis: it argues that activity to prosodic features of languages may be responsible for the contribution of Chinese tone sensitivity to English word reading. The second hypothesis is the segmental phonological awareness transfer hypothesis: that the transfer of Cantonese tone sensitivity to English word reading is mediated through the shared segmental processes involved in both Chinese tone and English phonemic processing.
	Study Two: Speech rhythm acquisition for Cantonese ESL children aged 3	1. Do monolingual children acquiring Cantonese and English display distinct rhythmic patterns at age three? 2. Do bilingual children have the same patterns as the monolinguals at the same chronological age? 3. What can affect the rhythmic development of bilingual children?
	Study three: Speech rhythm acquisition for Cantonese ESL children aged 2 to 6	Whether such rhythmic patterns can also be observed at a younger age (2 to 6) for children acquiring Cantonese and English monolingual and bilingual.
	Study Four: Tone influence in English lexical stress acquisition for Cantonese ESL children	Two structural equation Models are evaluated,i.e. a full model and a nested model.The full model consists of two possible pathways through which Cantonese lexical tone sensitivity might contribute to English lexical stress sensitivity. The nested model was nested within the full model, and consisted only of the indirect pathway.
	Study Five: English lexical stress acquisition for Cantonese ESL children influenced by Cantonese	Whether the different experience with F0, syllable duration and vowel quality in Cantonese would influence the acquisition of English lexical stress in simultaneous Cantonese-English bilingual children.

Table 4 shows the theme of each study after doing the thematic analysis, corresponding to related research questions in each study. The result of the thematic analysis will be the bias of discussion.

Points scored

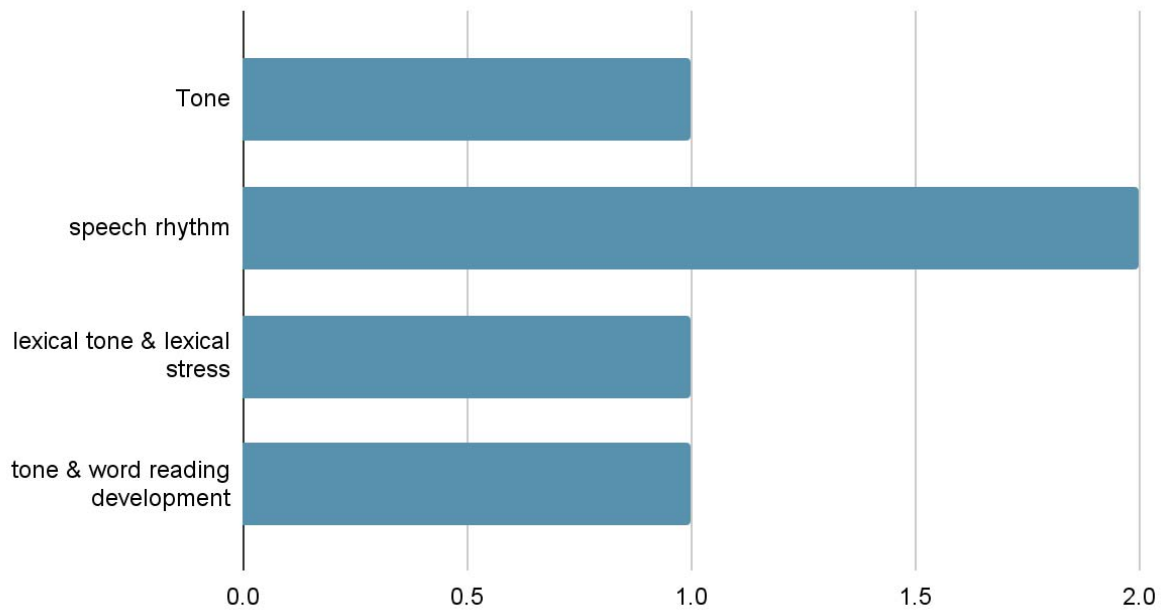


Figure 2. Themes and numbers

Figure 2 shows the number of studies with different themes. Obviously, the area of “tone influence”, “speech acquisition”, “lexical tone & lexical stress” and “tone & word reading development” will be the focus of this study. All of the focused areas for the selected papers are highly related to the research questions in this present study (phonological transfer).

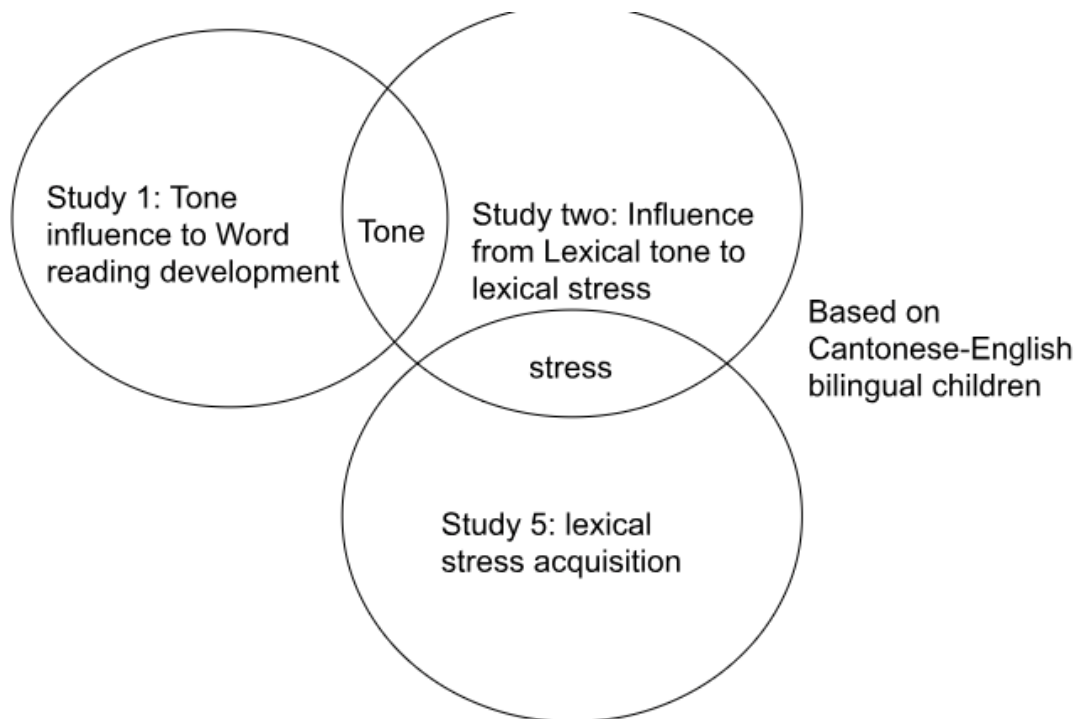


Figure 3. Thematic similarity

Figure 3 shows the thematic similarities between Study one, Study Two, as well as Study Five.

Table 5. Title of studies and main findings

Title	Main findings
1. Tone matters for Cantonese-English bilingual children's English word reading development: A unified model of phonological transfer	The integrated model (there are three models in this study, the first one is prosodic transfer model, the second one is segmental transfer model. Therefore, the integrated model is the one which combined the first and second model), which included both prosodic transfer and segmental transfer, was found to fit the data best. Cantonese tone sensitivity predicted English stress sensitivity, which in turn contributed to English word reading. Cantonese segmental phonological awareness predicted English segmental phonological awareness, which also contributed to English word reading. The integrated model accounted for 71% of the variance in Cantonese children's English word reading.
2. The acquisition of speech rhythm by three-year-old bilingual and monolingual children: Cantonese and English	Monolingual English children showed higher values for rhythmic metrics and lower percentage compared to monolingual Cantonese children, indicating more durational variability and stress-timing in English. Bilingual children showed similar rhythmic patterns to monolingual children, but the differences between their two languages were attenuated, especially for vocalic and syllabic intervals. The phonological difference in syllable structure contributes to the impression of different speech rhythms between languages. A detailed inspection of syllable structures confirmed the observed patterns, with the majority of syllables being of simple structure (V, CV, CVC) in both Cantonese and English for both monolingual and bilingual children. The results suggest that bilingual children may experience a delay in phonological acquisition compared to monolingual children, with bilingual children distinguishing different rhythmic patterns at around age four, approximately one year later than monolingual children.
3. Speech rhythm of monolingual and bilingual children at age 2;6: Cantonese and English	The results indicate that while the speech rhythms of monolingual children are different at 2;6, the rhythmic patterns of bilingual children are less distinct. The qualitative data collected also show that Cantonese syllable structure is simpler than English structure for both monolingual and bilingual children. Bilingual Cantonese is similar to monolingual Cantonese, while bilingual English has a simpler syllable structure compared to monolingual English. The study suggests that the establishment of language-specific rhythms takes longer for bilingual children compared to monolingual children, with rhythmic divergence developing considerably in the fourth year of life.
4. From lexical tone to lexical stress: a cross-language mediation model for Cantonese children learning English as a second language	Descriptive statistics for all tasks showed significant correlations between Cantonese lexical tone sensitivity, English lexical stress sensitivity, and general auditory sensitivity. Latent variable structural equation modeling revealed that the partial mediation model provided a better fit to the data compared to the full mediation model. The direct pathway from Cantonese lexical tone sensitivity to English lexical stress sensitivity had a larger relative contribution than the indirect pathway mediated by general auditory sensitivity.
5. The Acquisition of English Lexical Stress by Cantonese-English Bilingual Children at 2;06 and 3;0	Firstly, for English monolingual children before the age of three, syllable duration, rather than F0, is the primary cue for lexical stress contrast. Secondly, Cantonese-English bilingual children have a delay in developing syllable durational contrast for clear lexical stress patterns. The delayed development is possibly due to the fact that Cantonese, as a typical syllable-timed language, lacks lexical stress, and the experience with less variable syllable duration causes negative cross-linguistic effects.

Table 5 presents the main findings and title of the final list of studies, which could be related to the present study and correspond to the research question.

Table 6. List of studies and educational background

Title	Age of sample	Basic language background
Tone matters for Cantonese-English bilingual children's English word reading development: A unified model of phonological transfer	The mean age for the first and second testing points was 7.75 years (SD = 13 months), and 8.75 years (SD = 15 months), respectively.	1. All the sample children were native Cantonese speakers and English is their second language. They usually begin to learn English at the age of 3.5. 2. They are elementary school students.
The acquisition of speech rhythm by three-year-old bilingual and monolingual children: Cantonese and English	3-year-old	The sample children are bilingual and monolingual who are learning two different languages: Cantonese and English.
Speech rhythm of monolingual and bilingual children at age 2;6: Cantonese and English	2-10 years old	The sample children were the offspring of intercultural marriages who were exposed to Cantonese and English from birth and grew up in a 'one parent one language's environment.
From lexical tone to lexical stress: a cross-language mediation model for Cantonese children learning English as a second language	Second grade Cantonese-English children with mean age at 7 years old	All the sample children were native Cantonese speakers and English is their second language; Both Cantonese and English were taught as language subjects since the first grade. During the whole instruction, Cantonese is the primary language. They were exposed to eight English classes, which lasted for 40 mins each per week.
The Acquisition of English Lexical Stress by Cantonese-English Bilingual Children at 2;06 and 3;0	There is a chart in the study but I cannot understand the average age of the children	Six monolingual Cantonese, six monolingual British English and six Cantonese-English simultaneous bilingual children were used in this study. Five Cantonese children are featured in the HKU-Cantonese-70 corpus available in CHILDES; The other Cantonese child was recruited locally through word of mouth; Data of one English child came from the Forester corpus in CHILDES; Two of the English children were recruited in an English-speaking kindergarten in Hong Kong for children of expatriate families, and one English child was from a kindergarten in York, England. The other two English children were fraternal twins from an expatriate family in Hong Kong recruited through word of mouth. All the English children based in Hong Kong were monolingual; The six Cantonese-English bilingual children (two boys and four girls) are featured in the Hong Kong Bilingual Child Language Corpus which is available through the YipMatthews corpus in CHILDES

In conclusion, the sample of all the studies included in this essay are children aged from 2 to 10. Their first language is Cantonese and they learn English as their second language. The characteristics of the sample in these papers match the topic requested in the research questions.

Table 7. Country of origin for these five studies

Topic	Country of origin
Study One: Tone Influence in English Phonological development	Hong Kong
Study Two: Speech rhythm acquisition for Cantonese ESL children aged 3	Hong Kong
Study three: Speech rhythm acquisition for Cantonese ESL children aged 2 to 6	Hong Kong & England
Study Four: Tone influence in English lexical stress acquisition for Cantonese ESL children	Hong Kong
Study Five: English lexical stress acquisition for Cantonese ESL children influenced by Cantonese	Hong Kong

It could be seen from the table above that all the studies took place in Hong Kong, where Cantonese is the first language and English is learned as the second language. Hong Kong could be a significant region for analyzing Cantonese-English bilinguals.

Table 8. Topic and methodology

Topic	Methodology
Study One: Tone Influence in English Phonological development	This study uses quantitative study to examine the hypothesis and use the data collected from the study to answer the research question, the following is the tasks used by the authors in this study. <ol style="list-style-type: none"> 1. Nonverbal ability :use the Wechsler Abbreviated Scale of Intelligence to measure the Nonverbal ability 2. Cantonese tone sensitivity tasks: two tasks successfully used in previous research were used to distinguish Cantonese tone—one task is the tone identification task; the other one is the tone discrimination task 3. Cantonese segmental phonological awareness tasks: In these tasks, the author used a syllable deletion task and a phoneme-onset deletion task 4. English stress sensitivity tasks: in this task, the author used reviewed stress mispronunciation task 5. English segmental phonological awareness tasks: The Elision and Blending Words subtests of the CTOPP were used to measure children's segmental phonological awareness in English. 6. English word reading task:the Woodcock reading mastery test-revised was used to assess children's ability to accurately pronounce single words when presented in print.
Study Two: Speech rhythm acquisition for Cantonese ESL children aged 3	Quantitative research and rhythmic metric data
Study three: Speech rhythm acquisition for Cantonese ESL children aged 2 to 6	weekly longitudinal study; quantitative research; rhythmic metric data
Study Four:Tone influence in English lexical stress acquisition for Cantonese ESL children	Quantitative study: <ol style="list-style-type: none"> 1. An odd-one-out tone discrimination task was modified to assess children’s sensitivity to Cantonese lexical tones 2. A “DEEdee” task was adopted to assess children’s sensitivity to stress patterning in English 3. the beat perception in music task was used to measure children’s general auditory sensitivity 4. a serial-order reconstruction task was used as a measure of working memory
Study Five: English lexical stress acquisition for Cantonese ESL children influenced by Cantonese	Quantitative study and use data from corpus. For the corpus: there are two groups of data: 2;06 and 3;0. In the 2;06 group, there are seven simultaneous Cantonese-English bilingual children and five English monolingual children; in the 3;0 group, there are eight bilingual children and six monolingual children. The bilingual children all came from the YipMathews corpus in CHILDES

All these five studies are quantitative research. Study Two, Study Three, and Study Five use data (including recordings) from various exciting sources and qualify them. Study one and study four form a hypothesis or post-research questions and test it through a series of related tasks, and finally they come up with results to correspond to the research questions. For example, for the study *Tone Matters for Cantonese-English Bilingual Children's English Word Reading Development: A Unified Model of Phonological Transfer*, the author’s hypotheses in the article are 1. whether sensitivity to prosodic features of languages may be a key factor in the development of English word reading to the prosodic features of languages may be responsible for the contribution of Chinese tone sensitivity to English word reading; 2. whether the transfer of Cantonese tone sensitivity to English word reading is mediated through the shared segmental processes involved in both Chinese tone and English phonemic processing; and Chinese tone and English phonemic processing; Correspondingly, the authors used five small tasks inside the experiment: Cantonese tone sensitivity tasks, Cantonese segmental phonological awareness tasks, English stress sensitivity tasks, and Cantonese tone sensitivity tasks. awareness tasks, English stress sensitivity tasks, and English segmental—these tasks can present the subjects’ sensitivity to prosodic features. Finally, the authors used the English word reading task to measure the subjects’ English word reading levels. After all the tasks were done, the author concluded and could prove the hypothesis he made. As regards qualitative research, the authors similarly use qualitative data from the corpus and one of them uses rhythmic metric data. They collected the qualitative data by recording and counting the English or Cantonese pronunciation. Then they could analyze all the qualitative data they collected and come up with the result from the qualitative research.

4. Analysis

To summarize the key findings related to the research questions of this study, the author will focus on presenting, analyzing, and comparing highly related content from the studies selected from the scoping review. This part is divided into three topics: Tone matters for Cantonese children learning English as a second language, Lexical stress acquisition for Cantonese ESL children, and Rhythm acquisition for Cantonese ESL children. The

following will compare and contrast the five selected studies (divided by topic) in this scoping review in terms of research aim, key findings, and conclusions.

4.1 Tone Matters

As discussed earlier, both Study One and Study Four focus on the influence of tone on English pronunciation learning among Cantonese ESL children. They both demonstrate that the first language significantly impacts the phonological skills of Cantonese ESL children at the suprasegmental level.

4.1.1 Research Aim

Regarding the research aims, Study One aims to investigate the correlation between Cantonese tone sensitivity and English word reading, whereas Study Four aims to explore the relationship between Cantonese lexical tone and English lexical stress sensitivity. Despite the differing focus of the two studies—English word reading in Study One and English lexical stress in Study Four—these factors are interconnected. In English word reading, lexical stress plays a crucial role in conveying various meanings. Thus, while the specific conditions examined in both studies vary, they are conceptually linked.

4.1.2 Key Findings

In the first study, two routes are identified, indicating a correlation between Cantonese tone sensitivity and English word reading. The Prosodic Transfer model and its associated hypothesis propose that Cantonese tone sensitivity influences English stress sensitivity, which in turn enhances English word reading skills. This hypothesis aligns with the prosodic bootstrapping theory, suggesting that learners can use prosodic features to identify aspects of syntax. The authors argue that the comparable function and structure between Cantonese and English facilitate tone-stress association and phonological transfer from Cantonese to English. Longitudinal data support this hypothesis, suggesting that Cantonese tone sensitivity contributes to English phonemic processing. The segmental transfer model further supports this, indicating that Cantonese tone sensitivity enhances awareness of Cantonese segments and subsequently English stress sensitivity, ultimately benefiting English word reading skills.

In the fourth study, it is revealed that Cantonese lexical tone sensitivity influences English lexical stress sensitivity both directly and indirectly, mediated by general auditory sensitivity. This finding corroborates the combined model proposed in the first study, suggesting that Cantonese tone sensitivity contributes to English stress perception both directly and indirectly. Notably, Cantonese tone sensitivity makes a greater direct contribution to English lexical stress sensitivity compared to its indirect contribution.

Overall, these studies demonstrate the intricate relationship between Cantonese phonological features and English word reading skills, highlighting the importance of both segmental and supra-segmental aspects in phonological transfer from Cantonese to English.

4.1.3 Highlighted Points

Additionally, both studies highlight the phenomenon of tone-stress associations, which could explain the perception of lexical tone and stress. The most noteworthy discovery from these studies is that tone-stress associations could result in children speaking tonal English.

4.2 Lexical Stress Acquisition

In discussing Study Four and Study Five, both studies address the influence of Cantonese lexical tone on the perception or acquisition of English lexical stress, illustrating the broader impact of Cantonese on the English lexical stress learning process for Cantonese ESL children.

4.2.1 Research Aim

As discussed earlier, Study Four primarily aims to elucidate the mechanism by which Cantonese lexical tone sensitivity transfers to English lexical stress sensitivity among Cantonese ESL children. In contrast, Study Five investigates the acquisition of English lexical stress among Cantonese-English bilingual children, specifically examining whether linguistic experience, including exposure to F0, syllable duration, and vowel quality in Cantonese, influences the acquisition of English lexical stress. This motivation leads the authors of Study Five to collect data on syllable duration and peak F0 of vowels in each syllable using Praat.

4.2.2 Key Findings

The discussion above contrasts the findings of Study Four and Study Five regarding the influence of Cantonese on English learning among Cantonese-English bilingual children. Study Four suggests that Cantonese lexical tone sensitivity directly and indirectly contributes to English lexical stress sensitivity through general auditory

sensitivity mediation, implying a positive effect of Cantonese linguistic experience on English stress acquisition. Conversely, Study Five presents a different perspective, indicating a delay in the development of syllable duration contrast for clear lexical stress patterns in English among Cantonese-English bilingual children compared to their monolingual counterparts. Additionally, it highlights the absence of complex F0 in the Cantonese tonal system, suggesting that F0 is not a fundamental cue for lexical stress contrast for Cantonese ESL children. Consequently, Study Five suggests a delayed acquisition of English lexical stress among Cantonese children learning English as a second language, attributed to Cantonese being a syllable-timed language with a lack of durational variation. The discrepancy between these studies may stem from differences in the subjects' average age, with Study Four involving children nearly 8 years old, while Study Five focuses on 3-year-old children.

In conclusion, both Study Four and Study Five agree that Cantonese could impact English learning among Cantonese ESL children. However, their findings present inconsistencies. Study Four suggests a positive influence of Cantonese tone sensitivity on English stress acquisition, while Study Five implies a potential delay in English stress acquisition due to differences in syllable duration contrast. These contradictory findings underscore the complexity of the relationship between Cantonese and English phonological acquisition among bilingual children.

4.2.3 Highlighted Points for Both Studies

Apart from the cross-language comparison for bilingual and monolingual children, study five also compares the cross-aged issues. It shows that the stressed and unstressed syllable durations are more contrastive in the monolinguals at three than at two. The development of syllable duration contrast is slower in Cantonese-English bilingual children than in English monolingual children.

4.3 *Speech Rhythm Acquisition*

4.3.1 Research Aims

Study Two and Study Three, authored by the same researcher, have analogous research aims focus on the acquisition of speech rhythm in young children. Study Two investigates the acquisition of speech rhythm in 3-year-old children and contrasts them with their age-matched peers. Likewise, Study Three aims to examine the rhythm development of Cantonese-English bilingual children at the age of 2;6 and juxtapose them with their monolingual counterparts. Study Three extends the findings of Study Two by seeking to confirm whether the observations made in Study Two are applicable to younger children as well.

4.3.2 Key Findings

Study Two examines collected data and reveals that monolingual children exhibit distinct rhythmic patterns compared to bilingual children, whose rhythmic patterns in their two languages are less dissimilar. Furthermore, bilingual English displays lower durational variability than monolingual English, indicating a unique phonological development trajectory for bilingual children characterized by acquisition delays influenced by language dominance.

Similarly, Study Three echoes the findings of Study Two, demonstrating that bilingual children's rhythmic patterns are less disparate. Specifically, Study Three identifies three key findings. Firstly, the speech rhythm patterns between the two languages of bilingual children are less distinguishable than those of monolingual children. Secondly, monolingual Cantonese children exhibit higher values on rhythmic metrics and a lower percentage of vocalic intervals compared to monolingual English children. Thirdly, rhythmic patterns may continue to diverge throughout the second year of life, particularly with a significant increase in syllabic variability observed in monolingual English children.

4.3.3 Highlighted Points for Both Studies

Study Two emphasizes that syllable-timing is prevalent in early phonological development across languages, while stress-timing features are acquired later in the developmental process. Additionally, the rhythmic metrics in the study indicate that bilingual English exhibits higher durational variability compared to Cantonese, mirroring the patterns observed in monolingual children. Consequently, despite being less stress-timed than monolingual English, the development of bilingual English aligns with expected trajectories.

In Study Three, various aspects of phonology are examined, including syllable structure and lexical stress, providing a more comprehensive understanding of rhythmic development. It underscores the distinctions in speech rhythm development between monolingual and bilingual children at a young age, shedding light on the intricate process of phonological acquisition in bilingual contexts.

5. Discussion

This part uses the analysis drawn above to answer the research questions posed in this study. Subsequently, a categorisation of the three research questions in this paper is presented.

5.1 Research Question One

To ensure the rigour of the study, research question one was formulated to verify that Cantonese phonological features would impact the learning process of English word reading for Cantonese-English bilinguals. Based on my preliminary knowledge of the field, I presume there would be a degree of influence from Cantonese to English phonological acquisition since there are distinct features in “Hong Kong English” that differentiate it from other types of English. Question one could confirm my hypothesis in this study, when this research question is approved, the following questions 2 and 3 could be continued.

All of the studies selected during the scoping review agree that Cantonese influences English phonology learning. The impact of these studies can be categorized into three types: Tone matter in English pronunciation (study one and study four), Problems in English lexical stress acquisition (study four and study five) as well as difficulties in learning speech rhythm in English (study two and study three). The subject of these studies is mainly focusing on Cantonese-English bilingual children, which corresponds to my research topic.

In conclusion, all the selected studies agree with my hypothesis that Cantonese would influence English phonological development for Cantonese ESL children. The next part will discuss research questions two and three in detail.

5.2 Research Question Two

The main purpose of proposing this question is to explore the influence of Cantonese on English pronunciation acquisition for Cantonese-English bilinguals. After collecting the relevant literature, it was found that for Cantonese-English bilinguals, the influence of their mother tongue (Cantonese) on English phonological acquisition is that Cantonese phonological features will form a part of the child’s pronunciation system, and when the child learns English by using phonological skills Cantonese, it will make the child’s intonation less standard than that of a native English speaker. The influence of Cantonese can be roughly classified into the following categories (tone/stress/rhythm). Therefore, Research question two plays an important role in a better and more comprehensive presentation of the current research findings in this area, and in assisting with subsequent studies. This part will present the influence of Cantonese on English phonological acquisition in detail, divided into three categories.

5.2.1 Tone Matters for Cantonese Children

Study one and study four discuss the tone matters for Cantonese-English bilingual children when they acquire English phonological skills. For study one, the authors compare the functional as well as structural similarities of Cantonese and English and agree on the “tone-stress” association. They also found out in other studies that tone language speakers tend to “tonalize” English because there is a unified model for phonological transfer, in which includes “tone transfer”. Similarly, the authors in study four also agree with the “tone-stress” association, and they point out that this kind of association may be responsible for the joint phonological and acoustic that underlie lexical tone and lexical stress perception. Authors in study four suggest a direct pathway to explain the association between the Cantonese lexical tone sensitivity and the English lexical stress sensitivity. Both of them approved the tone transfer from Cantonese to English with the Cantonese ESL learners. Cantonese and English have various phonological systems. Cantonese, a typical tone language, uses different patterns of pitch to distinguish Cantonese words, and different patterns of pitch mean different tones (altogether 6 tones). Different tones in Cantonese can make the meanings of words different. However, English does not use “pitch” to differentiate English words, and there is no such concept as “tone” in English. For bilingual development, there is a concept named “phonological differentiation” (Nicoladis & Genesee, as cited in Tong, He, & Deacon, 2017), They mention that there is a lack of apparent phonological differentiation for bilingual children, claiming that there might be a unitary phonological system for bilingual children. It could be used as an explanation for “tonal English” for Cantonese ESL children, who apply the “tone system” from Cantonese to the English phonological system.

The result of the transfer in these two studies is that Cantonese-English bilingual children could use their phonological skills in Cantonese, including tone sensitivity, to facilitate English stress learning, and English word reading, though it may cause “tonal English”.

5.2.2 Stress Acquisition for Cantonese-English Bilingual Children

Study four and study five analyze stress acquisition for Cantonese ESL children, and present the result of it. Study four focuses on revealing how Cantonese lexical tone sensitivity contributes to English stress sensitivity within Cantonese ESL children. It collects data from two to three-grade students and uses structural equation modelling to get the result. The result shows that Cantonese children make use of their sensitivity to suprasegmental phonology in Cantonese to process the suprasegmental phonology in their second language. That is, Cantonese lexical tone could contribute to the awareness of English lexical stress. Study five also focuses on the acquisition of lexical stress for Cantonese children when they learn English. What should be noticed is that this study is focused on the aspect of stress contrast. Cantonese is a syllable-timing language, therefore, it lacks lexical stress, which leads to the delayed development of syllable durational contrast. The linguistic experience with less syllable durational contrast impacts negatively the learning process of English stress.

The reason why these two studies have different results is that study four investigates the cross-linguistic influence of sensitivity to phonological features. Cantonese children have a strong sensitivity to tone, which is a suprasegmental feature of a language and could improve their sensitivity to the suprasegmental feature of the second language (English stress). However, study five stresses the delayed development of syllable duration contrast, which is an important feature in English but lacking in Cantonese. Therefore, it becomes negative for Cantonese children to learn English.

In conclusion, the influence of Cantonese on Cantonese children could improve the sensitivity of lexical stress but impede the acquisition of variable syllable duration in English lexical stress. Cantonese children may have a high sensitivity to English lexical stress (positive), but when they start to acquire and use lexical stress, they may find it hard for them to present the distinct syllable duration in English lexical stress.

5.2.3 The Acquisition of Speech Rhythm

Study two and study three analyze the acquisition of speech rhythm for Cantonese-English bilingual children, though the age range of the subjects is different. The methods used by these studies are the same and the results of these studies are similar. Both of them show less distinction between Cantonese children in the rhythmic patterns. Because of the features of the rhythmic influence from Cantonese to English, Cantonese children show a delay in rhythmic development when they acquire English. Additionally, because of Cantonese dominance, Cantonese children are usually less stress-timed than monolingual English speakers. This influence from the mother tongue is long-lasting since the investigation of Cantonese adults is nearly the same.

5.3 Research Question Three

Research question three stresses how the linguistic experience of Cantonese influences English learning for Cantonese-English bilingual children. The main purpose of this research question is to present the mechanism of the influence of Cantonese on English phonology acquisition for Cantonese-English bilingual children. The following will be divided by themes of the five papers.

5.3.1 Tone Matters for Cantonese-English Bilingual Children

As regards the tone transfer from Cantonese to English, study one and study four reveal different paths.

Turn first to study one. Study one uses an integrated model to describe the Cantonese-English bilingual tone transfer to English word reading. It examines the segmental pathways as well as the suprasegmental pathways across language and concludes that the transfer of Chinese lexical tone sensitivity to English word reading is operated as a joint contribution of segmental and suprasegmental connections between Chinese and English. The integrated model means that the tone transfer could be the result of the coexisting of two pathways: Cantonese tone sensitivity facilitates English stress sensitivity, and in turn, facilitates English word reading; additionally, Cantonese tone sensitivity is associated with Cantonese segmental phonological awareness, and facilitates English stress sensitivity, and in turn be beneficial for English word reading; finally, Cantonese stress could predict English stress sensitivity, and English stress sensitivity is related to English word reading. After analyzing the above, that is, Cantonese tone sensitivity is related to Cantonese segmental phonological awareness, and predicts English segmental phonological awareness and therefore, to English word reading. The following figures describe the tone transfer from Cantonese to English.

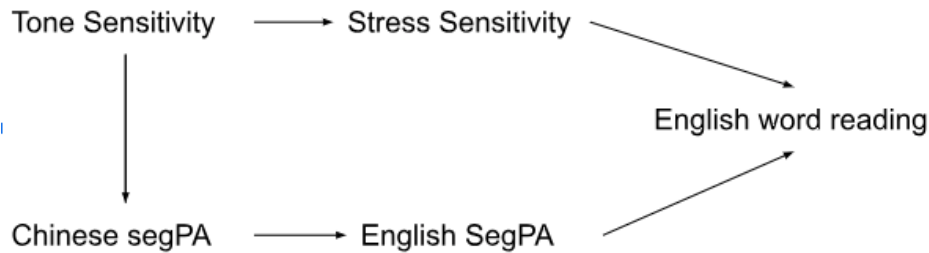


Figure 4. The tone transfer from Cantonese to English for Cantonese ESL children in study one

Study four suggests that the tone transfer from Cantonese is both directly and indirectly mediated by general auditory sensitivity. Cantonese lexical tone makes a bigger direct contribution than indirect contribution to English lexical stress sensitivity.

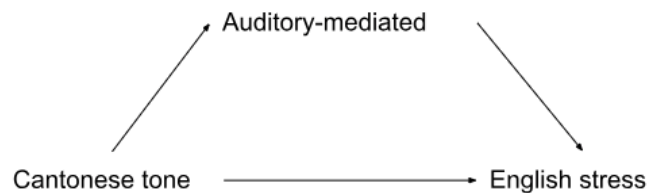


Figure 5. The mechanism of tone influence on English stress

5.3.2 Stress Acquisition for Cantonese-English Bilingual Children

Study four is discussed above. Study five focuses on the stress acquisition for Cantonese-English bilingual children. It does not generate an established mechanism of how Cantonese influences English, instead it concludes what aspect of linguistic experience in Cantonese would influence English stress acquisition. In one word, the influence of Cantonese is caused by the difference between Cantonese and English.

Firstly, there is no lexical stress in Cantonese, while lexical stress plays an essential role in English phonology which could change the meanings of words. The lack of lexical stress in Cantonese impacts the English lexical stress acquisition for Cantonese speakers.

Secondly, F0 is not being used in Cantonese to distinguish the variation between lexical stress, while it is one of the correlates of English lexical stress. More importantly, this study also points out that even though Cantonese children have experience with F0 variation in Cantonese tone, they will not use these skills to distinguish English lexical stress.

The results of study four and study five are different since they focus on different aspects of English linguistics: study four focuses on the skill in tone sensitivity, while study five stresses the lack of lexical stress in English and skills in using F0 to differentiate English stress.

5.3.3 Speech Rhythm Acquisition for Cantonese-English Bilingual Children

Study two and Study three do not display an exact mechanism for the influence of Cantonese on English speech rhythm. They use the distinction between Cantonese and English to analyze the process of influencing.

Study two claims that as a syllable-timed language, Cantonese plays an important role in the acquisition of English speech rhythm. Cantonese linguistic features, including the lack of lexical stress and phonological vowel reduction, acquire English lexical stress. The Cantonese dominance also contributes to the asymmetrical influence of prosodic development. It suggests that the phonological features of Cantonese, which also means the difference between Cantonese and English, affect the acquisition of speech rhythm in English. Study three mentions that Cantonese is a syllable-timed language, which is different to English. Each syllable in Cantonese is given the same stress and duration, while English is a stress-timed language, the syllable will be different because every word (more than one syllable) has stressed and unstressed syllables. Rhythm is based on the stressed syllables. Therefore, the difference between stress-timed and syllable-timed language led to the

influence of Cantonese.

Both studies highlight the importance of considering the phonological features of various languages to understand the speech rhythm development in bilingual children.

6. Conclusion

6.1 Findings

In conclusion, this study examines phonological transfer from Cantonese to English among Cantonese ESL children. Through a scoping review, it collects relevant papers and applies thematic analysis to categorize them into three groups: tone transfer, English lexical stress acquisition, and English speech rhythm acquisition. The exploration reveals the phonological transfer mechanisms from Cantonese to English, highlighting both positive and negative influences stemming from the differences between the two languages. Four main findings emerge from this research.

Firstly, the influence of children's first language on their acquisition of a second language is evident. Cantonese, like Chinese Mandarin, being a tone language, imparts unique features to "Chinese English" due to prosodic differences. For instance, Mandarin-English speakers may apply tones to English syllables, reflecting first language transfer.

Secondly, enhancing tone recognition may aid Cantonese youth in learning English as a second language. Studies one and four focus on improving Cantonese tone sensitivity skills, which can be beneficial for recognizing English lexical stress patterns.

Thirdly, Cantonese influence on English stress acquisition can yield both positive and negative effects. While study four suggests that Cantonese children's sensitivity to lexical tone may enhance their sensitivity to lexical stress, study five indicates that Cantonese's lack of lexical tone results in delayed English stress acquisition, influenced by Cantonese dominance.

Finally, regarding speech rhythm acquisition, studies two and three emphasize the contrast between Cantonese's syllable-timed nature and English's stress-timed structure. This disparity leads to a delay in English speech rhythm acquisition for Cantonese ESL children.

6.2 Limitations & Key Learning

While this study has contributed valuable insights into the phonological transfer between Cantonese and English and has addressed several research questions, it is important to acknowledge certain limitations.

6.2.1 The Size of Dataset

As the topic of this study is specific, it has been challenging to gather papers closely related to it. Nevertheless, by using Covidence, we identified 50 papers on the acquisition of English by bilingual children. However, certain papers related to other areas, such as child illness implantation, were excluded. Thus, the final dataset for this research comprises only five papers with limited themes. Further investigation into phonological transfer should encompass additional aspects, including intonation and pitch, among others.

6.3 Data Collection Method

This study utilises a scoping review methodology to gather the dataset, rather than administering tasks or trials to evaluate the children and recording their English as a sample for analysis. The studies chosen through the scoping review are considered rigorous, however, they were published within the past decade. Therefore, analysis necessitates the collection of more recent data.

6.4 Key Learning

After reviewing relevant studies, valuable insights emerge to guide the teaching of English to Cantonese-speaking children. Leveraging Cantonese children's proficiency in their native tone, educators can employ a progressive approach. Initially, they should focus on refining the children's sensitivity to tone in Cantonese, using similar techniques to develop an understanding of stress patterns in English sentences. Exposure to English radio can further augment their comprehension of stress nuances.

Once students grasp English stress patterns, educators must clarify the distinctions between Cantonese and English phonological features. Emphasizing English's unique characteristics while disregarding Cantonese norms is essential. Phonological features, including lexical stress and stress variations, are pivotal for attaining a standard English accent.

Moreover, students should be guided to discern the rhythmic disparities between Cantonese and English speech.

Familiarity with English rhythmic patterns enables teachers to effectively facilitate the acquisition of accurate speech rhythms.

By structuring the curriculum around these principles, educators can scaffold Cantonese children's progression towards English proficiency in a logical and systematic manner.

6.5 Research Gap

This study utilizes a scoping review to compile studies on phonological transfer in Cantonese-English bilingual children, aiming to investigate the influence of Cantonese on English learning among Cantonese ESL children and elucidate the underlying mechanism of phonological transfer. However, certain research gaps have been identified due to constraints in time and effort.

Firstly, the age ranges covered in the selected studies do not fully encompass all children relevant to the focus of this dissertation. While the dissertation focuses on Cantonese-English bilingual children under the age of 18, the age ranges of the five chosen studies are limited to three-year-olds, four to six-year-olds, and so forth, which does not adequately represent the concept of “children.”

Secondly, the dissertation aims to provide a general summary of the literature rather than synthesizing concrete evidence to address the research inquiries. Given that the phonological transfer of bilingual children may vary case by case, simply compiling information from other studies to answer the dissertation’s questions may reduce its authority.

Further research is imperative to elucidate why Cantonese affects the English learning process for Cantonese ESL children. While the dissertation poses three research questions regarding the influence of Cantonese on English among Cantonese ESL children, the resulting effects, and its impact, the five studies gathered from the scoping review fail to delve into the root cause of phonological transfer between Cantonese and English. Consequently, the dataset and research questions within this dissertation were unable to discern the underlying reasons behind this phenomenon.

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