Investigating the Impact of Mother Tongue Pronunciation on Mandarin Chinese Pronunciation: A Case Study of International University Students in Xuzhou, China

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Abstract. This essay explores how international students' mother tongue affects their pronunciation of Mandarin. It primarily focuses on the challenges that students face while learning the language, the variables that impact on their ability to learn the language and the solutions that students believe can overcome the influence of their mother tongue on pronunciation. Through interviews with 20 international students from the International College of Jiangsu Normal University in Xuzhou, China, it was found that international students have difficulties with the tones of Mandarin, the vowels, the consonants and some pronunciation habits. Moreover, the syllable structure, physical characteristics and culture-related factors of international students' native languages all affect Mandarin pronunciation to a certain extent. This essay also proposes solutions for international students to overcome the difficulties including changing pronunciation habits, understanding differences in perceived phonological systems reducing barriers to cultural differences and continuous practice feedback.

Keywords: Education, Linguistic, Mandarin, Language.

1 Introduction

In the context of globalisation, increasing numbers of international students are moving to China to learn Mandarin. International students come from a variety of native language backgrounds, and their native language often influences them in the process of learning Mandarin pronunciation. This study aims to explore the influence of the mother tongue on the Mandarin pronunciation of international students coming to China in the process of learning Chinese in China's city of Xuzhou.

Xuzhou is a famous city for science and education, with the number of full-time schools, university students, full-time academicians, university student entrepreneurship parks and national key disciplines ranking second in Jiangsu Province. Xuzhou has 12 colleges and universities with 200,000 students. As a city with rich educational resources, Xuzhou attracts many international students to come to study. These students come from all over the world, with language backgrounds including, but not limited to, English, Arabic, French and Korean. In this study, international students in Xuzhou

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were selected as research subjects and data were systematically collected and analysed through semi-structured interviews. This study focuses on several aspects: first, understanding the phenomenon of native language transfer in students' Mandarin pronunciation, such as the difficulty in learning phonemes that do not exist in the native language (e.g., Chinese tones or burst tones); second, exploring how cultural background affects students' acquisition and use of phonology; and, finally, proposing different learning strategies to improve student's ability to pronounce Mandarin.

Through this study, it is hoped that the common problems and individual differences encountered by students from different native language backgrounds in learning Mandarin pronunciation and the reasons behind these problems and differences will be revealed. In addition, the study will attempt to provide targeted measures to help international students learn better Mandarin pronunciation. Ultimately, this study enhances the understanding of cross-cultural interactions in language learning and provides an empirical basis and suggestions for improving the teaching of Chinese as a second language.

2 Literature Review

2.1 Factors Affecting Pronunciation

Internal Factors affecting pronunciation are mainly the learners themselves. The learner's attitude towards learning and their general personality can have an impact on second language pronunciation [1]. Consequently, different personalities determine how seriously they fulfil their responsibilities and how much importance they attach to the language-learning process. Ali Khan (2019) categorised learners' personalities into extroverted and introverted learners and found that extroverted learners had more opportunities to practice oral pronunciation than introverted learners [2]. Pronunciation is also influenced by a learner's time commitment, willingness to learn the language, attitude toward language acquisition and identification with a certain cultural group [3]. Students with stronger motivation to learn are able to master the pronunciation of a second language more quickly. Ultimately, these factors will determine whether a learner acquires native-like pronunciation.

Another factor that affects pronunciation is age. According to Lenneberg's (1967) critical period hypothesis, it is easier to learn pronunciation during childhood [4]. Indeed, the learner will undoubtedly have an accent if he begins speaking the second language beyond the age of twelve [5]. Similarly, children's brains are more plastic than those of adults, and after the age of nine, children's brains mature and functions are distributed between the left and right hemispheres, making it difficult for children to acquire native-like pronunciation [6].

External Factors such as the learner's curriculum can impact pronunciation learning. Foreign language programs usually emphasise pronunciation in the first year of study, introducing the alphabet and pronunciation system of the target language. However, the emphasis on pronunciation rarely continues beyond the introductory stage [7]. Rosyid

(2016) also pointed out that exposure to the target language is one of the main factors affecting pronunciation learning [8]. The pronunciation of a second language can also be influenced by exposure to the target language and the teacher's teaching [9]. Szyszka (2018) suggests that due to the difference in learning environments, learners learn pronunciation more efficiently in an environment where there is a target language [10]. In this case, the school provides enough space, activities and exposure to enable learners to participate voluntarily in learning. This exposure is important because many learners have difficulty understanding the pronunciation of native speakers when learning a second language [11].

2.2 Influence of Mother Tongue on Pronunciation

Rosyid (2016) found that one of the first major factors that influence learners to learn pronunciation is the influence of their own mother tongue [8]. By statistically and descriptively analysing the learning of English by Sudanese university students, Hassan (2014) found that the variability of the systems of the mother tongue and the second language can have an impact on the learners' ability to pronounce words, especially in the pronunciation of vowels [12]. An empirical study also found that pronunciation problems were significant due to the lack of correlates of the target language in the learners' native Batak Toba language [13].

Furthermore, Noviyenty and Putri (2021) found that native language interference affects students' oral language proficiency, especially in pronunciation [14]. The study was conducted on students whose mother tongue is Rejiang language and it was found that they pronounce short vowels as long vowels, long vowels as short vowels and change the pronunciation of vowels. In analysing the influence of different dialect areas on English pronunciation, Zheng (2018) pointed out that negative native language transfer is the main reason why learners encounter difficulties in learning pronunciation [15].

Additionally, in the study of mother tongue on English pronunciation, Xue (2023) found that at the segmental level, it is mainly characterised by phonemic vacancies, incomplete phonemic correspondences and phonemic increases [16]. At the level of suprasegmental segments, it is mainly manifested in stress, intonation and connection. With the help of positive transfer from the mother tongue, while minimising negative transfer, students can master English pronunciation easily, efficiently and accurately. The mother tongue also effects the rhythmic aspects of pronunciation, as far as the segments are concerned, due to the absence of some specific vowels and consonants of the target language. Consequently, the interference of the mother tongue can lead to the inability of students to pronounce the sounds and it can affect their comprehension of these sounds when pronounced by others [17].

2.3 Chinese Language Learners' Difficulties in Pronunciation

As the second most spoken language in the world, Chinese learners are also influenced by their own mother tongue when learning pronunciation. In one study, it was shown

that Chinese learners have more difficulty with pronunciation than with Chinese characters and listening because Mandarin has complex characteristics [18]. Liu (2019) pointed to the tonal sandy ground, prosodic groups and tonal resonance features of Mandarin, where many of the pronunciation errors of non-tonal language learners are found [19]. Additionally, Yang (2013) found that the biggest difference between first language (L1) and L2 Mandarin Chinese lies in the frequency of target undershoot in L2 speech [20]. The infrequent tone target undershoots in L2 speech, especially among intermediate learners, were attributed to the incomplete acquisition of L2 prosody.

Taking the example of native English speakers, Yang and Jin (2018) found through an empirical study that CSL students have great difficulty in learning lingual vowels [21]. The difficulty of the various consonants and vowels may be due to different reasons, one of which is the perceptual assimilation between Chinese sounds and English ones. This is because Mandarin Chinese has three pairs of subvowels (i.e., dental, postnasal and palatal), whereas English has only one pair of postdental subvowels; Chinese postalveolar and palatal consonants may be perceptually assimilated to English postalveolar subvowels. The second difficulty is the unique tonal characteristics of the Chinese language, which can pose difficulties for learners. Tonal patterns in Chinese are rich in variability, gradation and exceptionality [22]. Therefore learning correct pronunciation is difficult. Zhang (2017) pointed out that the third tones in Chinese are extremely challenging for Chinese learners to learn [23].

2.4 Research Gaps

To sum up, many factors contribute to the learner's pronunciation influence in learning a second language. The influence of the learner's mother tongue on pronunciation is one of the big factors, which has a great impact on learning to pronounce both tones and words. According to previous studies, it can be seen that the mother tongue produces a negative transfer phenomenon in second language learning, and to a certain extent, this will affect the learners' understanding of pronunciation, which will lead to difficulties.

According to the existing studies, most of the research on the effect of mother tongue on the pronunciation component of second language acquisition has been conducted in English, and there are fewer studies on the effect of mother tongue on pronunciation in Chinese learners. However, Chinese, as the second most spoken language in the world, deserves to be carefully investigated. At the same time, there is a lack of detailed research on the different levels of Chinese learners, and the native language of different levels of Chinese learners may have different effects on Mandarin pronunciation to different degrees. Moreover, there are fewer studies on the effects of different countries' mother tongues on Mandarin pronunciation and it is worthwhile to investigate the different effects of different countries' mother tongues on Chinese.

3 Methodology

The purpose of this study is to investigate the influence of Chinese language learners' mother tongue on Mandarin pronunciation. This study aims to comprehend the transfer effect and the mother tongue's impact on the second language's phonological features. In this study, 20 students from the International College of Jiangsu Normal University (JSNU) were interviewed in a semi-structured interview about phonology to study the influence of different native languages on Mandarin pronunciation. This study lasted 15 days, beginning on May 20, 2024 and finishing on June 3.

3.1 Research Participants

The interviewees chosen for this study were students in the HSK2 class at the International College. There were six Arabic native speakers, seven Korean native and the number of seven English native speakers, representing three different language families: Afro-Asian, Altaic and Indo-European which were then analysed to investigate the influence of Chinese learners' native language on Mandarin pronunciation under these different language families. These three groups have similar numbers of people with the same Chinese language level, facilitating the subsequent analysis. The details of the interviewees are shown in Table 1:

Table 1. Research participants and their language family

Research Participants	Total	Language family
Korean students	6	Altaic
Moroccan students	4	Afro-Asian
Comorian students	3	Afro-Asian
Liberian students	5	Indo-European
Jamaican students	2	Indo-European

3.2 Data Collection and Analysis

The data collection of this study was divided into two parts. The first part was the collection of basic information about the international students, specifically how long they have been in China, the country they come from, the length of time they have been learning Chinese, their age, etc. It's important to collect and consider these variables as they can affect international students' learning of Mandarin pronunciation. These variables can also be used to form questions about international students' specific situations in the interview process. The second part of the data collection was the collection of international students' answers to questions about Mandarin pronunciation and their native language Mandarin pronunciation, which mainly focused on the influence of international students' native language on Mandarin pronunciation and the difficulties they encountered.

In the data analysis stage, the researcher first converted the interview transcripts and audio recordings into official transcripts and made further revisions and corrections according to the audio recordings. Secondly, other variables collected in the first part of the data that might affect Mandarin pronunciation were analysed and summarised to ensure that the research focus of this study was not interfered with by other variables. Finally, the themes and keywords related to this study in the respondents' answers were retained and the keywords in the respondents' answers that were not related to the themes of this study were eliminated for refined analysis.

3.3 Ethical Considerations

All subject respondents were informed of the specifics of this study before the formal interview and signed a consent form after being interviewed. Withdrawal for any reason during the specific interview was fully permitted. Subjects' personal information was kept confidential during the research process of this study and all data were used only by the researcher and were not disseminated.

3.4 Limitations

Although this study ensured rigour throughout the interviews, there were some limitations. The first is that the number of interviewees involved in this study is not sufficient and may not be representative of the overall situation. Secondly, the truthfulness of the interviewees' responses in this study may be biased in that the mediating language between the interviewer and the interviewees is mainly English, and therefore, non-native English speakers may differ from their own inner thoughts in their responses. Moreover, because all of the interviewees are HSK2 students, they studied Chinese for a shorter amount of time and may not have given Mandarin pronunciation as much care as they should have, which may have contributed to their less thorough and polished responses. Although the researcher made every effort to encourage the participants to reflect thoroughly, there was still some influence on their responses.

4 Findings and Analysis

Based on the interviews with international students, this section elaborates and analyses the difficulties encountered by international students in the process of learning Mandarin pronunciation, the influence of international students' mother tongues on Mandarin pronunciation and the relevant solutions that could improve international students' Mandarin pronunciation.

4.1 Difficulties Encountered by International Students in Learning Mandarin Pronunciation

Tones of Mandarin. When asked about difficulties in learning spoken Mandarin pronunciation, international students from Korea, Morocco and Liberia all mentioned the

tones of Chinese Mandarin. Since there are four tones in Mandarin, and the meaning of Chinese characters usually changes when the tones change, it is challenging for international students to master the use of the four tones in spoken Mandarin. In Korean, for example, there are no tones and the meaning of most words is determined by context alone. As one of the Korean students said:

When speaking Chinese, because I can't accurately judge the use of tones in words, I always say words that are different from the meaning of the words in my daily speaking practice, and I have some confusion about the use of tones (student D).

Moreover, for international students who do not have a tone system in their native language, mastering the different pronunciations of the four tones in Chinese Mandarin is a major difficulty. In particular, the second tone ascending and the third tone descending and ascending are easily confused with other tones. Moreover, it is also difficult for international students to use the tones correctly and maintain their consistency and naturalness in fluent conversations. Especially in rapid language communication, the accuracy of tones tends to decrease. As one Moroccan student put it:

When I tried to say a complete sentence in a row, my teacher would point out that I mispronounced the tones of many of the words in the sentence, but if I was asked to read a word or one kanji, I was able to read it correctly (student E).

In summary, it can be seen that learning tones is not only a training of pronunciation but also a deepening of the understanding of the whole phonological system. Therefore, for international students who do not have tones in their native language system, the understanding of tones is not only a mere change of pitch as they also need to realise that tones are an important phonological component for differentiating meanings.

Vowels and Consonants. It is important to note that the vowel system of Mandarin includes single and compound vowels. As a result of this, during the interviews with the research participants, international students from Liberia and Jamaica mentioned that some vowels in Mandarin are not found in their mother tongue, such as [ü] (e.g., "绿"), which is very difficult for international students to accurately pronounce. Additionally, Mandarin Chinese has three pairs of subvowels (i.e., dentals, velars and palatals and palatals). However, for native speakers of English, there is only one pair of postalveolar subvowels, postalveolar and palatal consonants in Mandarin which may be perceptually assimilated to postalveolar subvowels in English. As a result, the postalveolar and palatal consonants of Mandarin may be perceptually assimilated to the postalveolar diphthongs of English, thus creating difficulties for second-language learners.

Moreover, the pronunciation of many characters depends on the correct combination of consonants and rhymes. For students who are unfamiliar with this structure and whose native language does not have such combinations, it is a challenge to accurately combine consonants and rhymes. An international student from Liberia said:

When I want to pronounce the kanji for 天 (tiān), I always wonder where I should put my tongue to pronounce the kanji correctly (student A).

Some consonants in Mandarin, such as “zh”, “ch”, “sh” and “r”, do not have corresponding pronunciations in some languages, such as Korean, English and French, so international students may feel confused when learning these phonemes. In addition, the distinction between clear and turbid consonants in Mandarin is also difficult for students of some languages. For example, the clear sound “p”, as in the Chinese character “pāi”, is pronounced without vibration of the vocal cords. The fricative “b”, as in the Chinese character “bǎ”, is pronounced with a vibration of the vocal cords. These two sounds are opposites in many languages, but in Chinese, “b” is a semi-turbid tone, unlike the fully turbid tone in English. In addition, Chinese consonants include some special pronunciations, such as “q”, “j”, and “x”, the correct pronunciation of these consonants requires students to master specific tongue positions and airflow control, which is difficult for beginners to master. They are more difficult for beginners to master. An international student in Jamaica said in a study about the pronunciation of Mandarin consonants:

I can recognise pinyin, and I don’t find it difficult to pronounce it when I read aloud after my Chinese teacher, but when it comes to pronouncing some Chinese characters with special consonants on my own, I can’t control the movement of my mouth to pronounce them correctly (student F).

In summary, it can be seen that the correct combination of sounds and rhymes is the key to learning Mandarin pronunciation, and it is relatively difficult for international students at beginner’s level of Chinese to understand and practise these combinations of pronunciation.

International Students’ Mother Tongue Pronunciation Habits. When international students learn Mandarin pronunciation, their pronunciation habits, especially those originating from their mother tongue, have an important influence on the learning of Mandarin pronunciation and they sometimes encounter difficulties in the learning process. First of all, the pronunciation habits of international students’ mother tongue can affect students’ learning of Mandarin pronunciation. For example, if the position, shape and movement of the lips and tongue used in the student’s native language differ significantly from those in Mandarin, the student may need extra time and practice to adapt to the Mandarin pronunciation habits. This dilemma can be seen with a Jamaican student, who said:

In English, I have my own pronunciation habits, so my tongue and lips work well together, but some words in Mandarin are too difficult for me to react to and pronounce proficiently (student K).

Secondly, the phonetic logic of international students’ native languages may be different from that of Mandarin. For example, Comorian international students pointed out in their interviews that the rules for combining certain syllables or phonemes in their mother tongue are different from Mandarin, so they would apply the logic of their mother tongue to Chinese learning. One of the international students said:

Because I communicate in English in my daily life, I always say that I speak Chinese in the same way I speak English and recognise spelling when I learn Mandarin, and this habit still exists in my Mandarin learning, which causes my pronunciation of some Chinese characters to be not as accurate as it should be (student B).

Finally, foreign students may not require as much accuracy in certain pronunciations in their mother tongue due to their own increased tolerance for mispronunciation. This could make students more accepting of their pronunciation errors and less likely to notice and fix them when learning Chinese. An international student said:

When I first came to China to learn Mandarin, I often used my native pronunciation as the standard and ignored some mistakes in Chinese pronunciation, but later I realised that this would have a great impact on my Mandarin pronunciation (student M).

In conclusion, the influence of the mother tongue on learning Mandarin pronunciation is far-reaching, and being aware of these influences and adopting targeted strategies are the keys to improving pronunciation.

4.2 The Impact of International Students' Native Language on Mandarin Pronunciation

Syllable Structure of the Learner's Native Language. In Mandarin, the syllable structure of the Chinese language is relatively complex and a complete syllable usually consists of consonants, rhymes and tones. The consonant is the beginning of a syllable, which can be a consonant, such as "b", "p", "m", "f", etc.; the rhyme is the vowel part of a syllable, which can be a single vowel (e.g. "a", "p", "m", "f"). Rhymes are the vowel part of a syllable and can be single vowels (e.g., "a", "e", "i"), compound vowels (e.g. " ai", "ei", "ao", "ou"), or rhyming vowels containing nasal sounds (e.g. "an ", "en", "in"). In addition, each syllable carries a tone, which plays a key role in semantic differentiation. For the international students interviewed, the syllable structure involved in their native language is relatively simple and in the case of Korean students, the syllable structure of Korean is simpler. Korean syllables usually consist of an initial sound (consonant), a middle sound (rhyme) and an optional final sound (coda).

Due to these structural differences, international students face multiple challenges in learning Chinese. First of all, compound rhymes in Mandarin are difficult for international students. For example, there are no compound rhymes in some languages that directly correspond to the Mandarin "iang" or "uang," which results in students attempting to pronounce these sounds in an unnatural or inaccurate manner. They may break the compound vowel into several separate vowels to pronounce them, which affects the fluency and accuracy of the pronunciation. This is noted by a Korean student, who said in an interview:

When I first started learning pinyin, I was confused by some complex pinyin structures, and I didn't know how to combine them and then pronounce them. I think it was because these syllables don't exist in Korean, so I found it difficult at the beginning of the learning process (student G).

Secondly, the tonal elements in Mandarin syllables are also a challenge for international students. Due to the lack of tones in Arabic, Moroccan students often have difficulty in grasping how to differentiate meaning through tones when they first learn Mandarin, which may lead to errors in comprehension and expression.

In conclusion, the fundamental differences in syllabic structure, especially in the complexity of rhymes and the use of tones, have a significant impact on international students' learning of Mandarin pronunciation. This not only requires them to adapt to

the completely new syllable structure but also requires them to strengthen their understanding and mastery of complex rhymes and tones in their pronunciation practice.

Differences Between Learners' Phonological Systems and Chinese. In the process of learning Chinese by international students, differences in the phonological systems of the learners' native languages have a particularly significant impact on the learning process. These differences are mainly reflected in the variety of consonants and their articulation, the system of vowels and the presence or absence of specific phonemes.

In the case of Moroccan students, for example, Arabic has a wider variety of consonants than Mandarin, especially in terms of glottalisation and palatalisation. Arabic has glottalised consonants such as "ح" (ḥāʾ) and "خ" (khāʾ), and jawed consonants such as "ص " (ṣād) and "ض" (ḍād), do not have direct counterparts in Mandarin. This leads to the possibility that Moroccan students may incorrectly apply these specific Arabic phonemes to their Mandarin learning, e.g., they may incorrectly pronounce "h" in Chinese as "ح" in Arabic, or "z" as "ض". In the interview, a Moroccan student said:

There are a lot of consonants in my native language that don't exist in Mandarin, so when I was learning Mandarin I would always use the sounds from Arabic to pronounce them in Mandarin, so my Chinese teacher sometimes couldn't understand the characters I was reading (student A).

However, the vowel system in Arabic is relatively simple, consisting mainly of three short vowels (a, i, u) and corresponding long vowels (ā, ī, ū). In contrast, Mandarin has a more complex vowel system that includes a variety of single and compound vowels. Comorian students, for example, may have difficulty distinguishing between "ai" and "ei" or "ou" and "uo" because such vowel combinations do not exist in Arabic. In addition to this, there are some specific phonemes in Arabic, such as the palatal velar "ق" (qāf), which has no direct equivalent in Mandarin. Comorian students may incorrectly map such phonemes to similar phonemes in Mandarin, e.g., pronouncing the Chinese "q" as the deeper-throated "ق". In addition, the difference between the Arabic word ر (rāʾ), which is a fricative and the Chinese word r, which is a fricative, may also lead to mispronunciation.

The significant differences between the phonological system of Arabic and Mandarin have had a profound impact on the learning of Mandarin pronunciation. These differences relate not only to the pronunciation of specific phonemes but also to the understanding and application of the entire vowel and consonant system.

Physical Characteristics of Learner Voice Realisation. In the process of learning Mandarin pronunciation, international students will bring their pronunciation habits into Mandarin. For example, Mandarin pronunciation involves a series of complex adjustments in tongue position and mouth shape, which may be a challenge for Liberian students who are native English speakers. For example, the Mandarin consonants "zh," "ch," and "sh" require the tongue to be positioned close to the hard palate, creating what is known as a rolled tongue. Similar sounds in English, such as "sh," are pronounced with the tongue positioned lower and do not require a tongue roll. This difference requires Liberian students to reposition their tongues when learning Mandarin,

which may take additional practise and time to master. A Liberian student shared his experience of learning Mandarin:

When I learn some Chinese words, such as "zhīdào" (know) and "chīfàn" (eat), I need to roll my own tongue, but often this is very difficult for me, so the pronunciation is always inaccurate（student H）.

In addition, some specific consonants in Mandarin, such as "j", "q", and "x", do not have a direct equivalent in English and they are pronounced between the hard palate and the teeth, requiring the tip of the tongue to be pressed against the lower teeth and the tongue surface to be raised. These consonants are pronounced between the hard palate and the teeth, requiring the tip of the tongue to be pressed against the lower teeth and the surface of the tongue to be raised. For Jamaican students, this position is unfamiliar and they may not pronounce these consonants accurately at the beginning of the learning process, for example, pronouncing "j" as "j" in English (e.g. in "jeep"). The "r" sound in Jamaican English is a typical retroflex, whereas the "r" sound in Mandarin is a fricative similar to that in "日", pronounced between the tip of the tongue and the hard palate. This shift from a velar trill to a fricative is a significant adjustment for Jamaican students, requiring them to change their tongue use and pronunciation habits.

Through these detailed analyses, we can see that international students need to pay special attention to overcome the physical pronunciation habits of their native language and learn brand-new pronunciation techniques in the process of learning Mandarin pronunciation. These differences involve not only the pronunciation of specific phonemes but also the understanding and application of the entire pronunciation system.

Cultural and Linguistic Influences. The influence of international students' own culture and phonology is an important dimension. The cultural background of international students not only affects language use and comprehension but also profoundly influences the way phonology is learned and realised. An important example of this can be seen with international students from Jamaica (where the main languages in Jamaica are English and Jamaican Creole); the cultural background and pragmatic conventions of these two languages spoken by Jamaican students significantly impact learning Mandarin pronunciation.

Jamaican English and Creole have distinctive rhythmic and intonational features in their phonological expressions, which can lead to several challenges in learning Mandarin pronunciation. For example, intonation variations in Jamaican Creole are primarily used to express emotional intensity rather than semantic differences, which is quite different from the Mandarin tonal system. Jamaican students may inadvertently apply the intonation patterns of emotional expression to Mandarin, resulting in an inappropriate use of tones. For example, they may incorrectly change the tones when trying to express emotions, such as adjusting the first tone of "喜欢" (xǐhuān) to a higher tone in the mistaken belief that it expresses a stronger feeling of fondness.

Jamaican linguistic conventions contain some distinctive patterns of speech, such as the frequent use of repetition of words in sentences to enhance intonation. This habit is less common in Mandarin and may affect Jamaican students' speech rhythm and flu-

ency. For example, they may repeat certain words and phrases excessively when learning Mandarin in an attempt to enhance the effect of the utterance, e.g., repeating "非常非常" to emphasise the degree of the adjective, which is not usually necessary in Mandarin.

In addition to this, some international students like Moroccan students may misinterpret some expressions in Mandarin due to differences in cultural backgrounds. For example, the polite expression "please ask", which is often used in Mandarin, may be misinterpreted as requiring special intonation or emphasis, and Moroccan students may incorrectly use elevated intonation in this expression to conform to their cultural habits, resulting in intonation that does not conform to the standard pronunciation of Mandarin.

Through the above analysis, we can see that in the process of learning Mandarin pronunciation, international students' mother tongue's cultural background and discourse habits have a significant influence on their pronunciation. These influences not only involve specific pronunciation skills but also the understanding and adjustment of the whole language usage habits, which are aspects that international students need to pay special attention to and adapt to in Mandarin learning.

4.3 Solutions to the Effect of International Students' Mother Tongue on Mandarin Pronunciation

In response to the difficulties learners have in learning Mandarin pronunciation and the influence of their own mother tongues on pronunciation, the international students gave many thoughts and solutions to the problems they encountered in Mandarin pronunciation during the interviews.

Changing Pronunciation Habits. Mandarin learners often find that their native language pronunciation habits conflict with Mandarin pronunciation. For example, native English speakers may find it particularly difficult to master the curly consonants (e.g., "zh", "ch", and "sh") in Mandarin because there is no similar pronunciation in English. This difference can be difficult to grasp at first but with repeated practice, watching pronunciation tutorials and imitating examples from native speakers, one can adjust the tongue position and pronunciation style to adapt to Mandarin pronunciation habits [24].

Understanding Differences in Perceived Phonological Systems. Differences between the phonological system of the native language and Mandarin, such as the presence or absence of tones, also directly affect the learning process. For example, as a native speaker of a non-tonal language, it is difficult to perceive and imitate the four basic tones when they first learn Mandarin, which often leads to misunderstandings in their expressions. Native speakers of English, for example, have great difficulty in perceiving tones when they first learn Mandarin. English is a non-tonal language, so it is usually not accustomed to differentiating meaning through tones [25].

Each of the four basic tones in Chinese can change the meaning of a word, which is a completely new concept for learners. For example, the word "妈mā" can mean

"mom" (mother), "麻má" (trouble), "马mǎ" (animal horse), and "骂mà" (scolding) depending on the tone. Therefore, the ability to recognise these subtle differences needs to be improved through extensive listening and tonal practice.

Reducing Barriers to Cultural Differences. Differences in cultural background can also affect the learning of Mandarin pronunciation. In the native culture of international students, it may not be customary to express emotion or tone of voice through tones or specific sound changes, which makes learners feel unnatural and confused in understanding and using Mandarin phonological expressions. In terms of cultural understanding, learners from non-Chinese speaking cultures may encounter comprehension barriers [26]. For example, Chinese often uses euphemisms and ambiguities in its expressions, which are different from the direct expressions in English. This cultural difference may cause learners to be too direct in using Chinese to express their emotions without considering the meaning of the words or the context. Therefore, by studying Chinese movies and books and interacting with native speakers, one can better understand and adapt to the cultural and pragmatic conventions of Chinese.

Continuous practice and feedback. Continuous practise is essential to overcome pronunciation difficulties [27]. Learners can record their Mandarin pronunciation and then compare it with the standard pronunciation to identify differences and deficiencies; they can seek feedback from teachers and peers to understand their pronunciation deficiencies and make adjustments based on this feedback. Participation in language corners or Chinese discussion groups can also help as these provide frequent opportunities for pronunciation practise and enable learners to improve and consolidate their pronunciation in real conversations.

5 Conclusion

In the wave of globalisation, Chinese Mandarin has become one of the key language skills pursued by many international students. Xuzhou, as one of China's educational centres, is home to a large number of international students from all over the world, which provides an excellent case study for examining the influence of the mother tongue on learning Mandarin pronunciation. Focusing on international university students' learning of Mandarin in Xuzhou, this study examines how their mother tongue affects their Mandarin pronunciation, analyses the common problems and differences in pronunciation learning among students from various language backgrounds and proposes effective countermeasures to help both teachers and students to learn Mandarin pronunciation and to improve the accuracy and fluency of their pronunciation.

In this study, students' personal learning experiences and feelings were collected through face-to-face interviews in a semi-structured interview mode to further understand the specific difficulties encountered by students from different native language backgrounds in learning Mandarin pronunciation. In the process of learning Mandarin,

the international students had some difficulties with the tones, vowel consonants and pronunciation habits of Mandarin.

Moreover, it was found that the influence of students' native language backgrounds on their learning of Mandarin pronunciation is manifested in three ways. The first is the presence or absence of phonemes. The second is the difference in syllable structure and the final aspect is the complexity of the tone system: students of non-tone languages face greater challenges in learning the four tones of Mandarin.

Based on these findings, this study proposes several strategies to aid in the learning of Mandarin pronunciation. Firstly, it is important to help students realise their pronunciation misconceptions and make targeted corrections by comparing the pronunciation differences between students' native languages and Chinese Mandarin. Next, teachers need to increase opportunities for language practice. Finally, students need to be encouraged to participate in activities such as language exchanges to increase their opportunities to use Mandarin and improve the naturalness and fluency of their pronunciation.

By studying the effects of Mandarin pronunciation among international college students in Xuzhou, this study not only provides insight into the specific effects of the mother tongue on second language pronunciation learning but also provides targeted strategies for Chinese Mandarin teaching practises and international learners. The implementation of these strategies hopes to improve teaching and learning outcomes, help international students better overcome the influence of their mother tongue and enhance their Mandarin pronunciation skills.

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