Analysis of Language Errors in the Pronunciation of Chinese Polyphonic Letters

Lusi[1], Lily Thamrin[2]
[1,2]Universitas Tanjungpura, Indonesia
E-mail: lusi@untan.ac.id, lily.thamrin@fkip.untan.ac.id

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Abstract
Polyphonic letters are unique in learning Mandarin language because they have more than one pronunciation sound, so they quickly cause language errors. This research is a descriptive study that analyzes language errors at the level of Mandarin phonology made by final semester students in the Mandarin language education study program. The research aims to discover the forms of language errors and the factors that cause them. Research data was obtained using tests and interviews directly with Mandarin language students from the results of pronunciation tests and interviews with students. From the analysis of language errors, four types of errors were found, including pronunciation errors due to changes in tone, pronunciation errors due to changes in consonants, pronunciation errors due to changes in vowels, and pronunciation errors due to changes in vowels and consonants simultaneously. Of these four types of pronunciation errors, the one with the highest error rate is the pronunciation error due to changes in tone. Factors that cause pronunciation errors in polyphonic letters are the complexity of the pronunciation sounds of the polyphonic letters themselves and inadequate mastery of Mandarin language rules and vocabulary. In learning Mandarin, polyphonic letters are not explicitly discussed per letter but per vocabulary, so it depends on the student's astuteness to remember the pronunciation sounds.

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Abstrak
Huruf polifonik merupakan huruf yang unik dalam pembelajaran bahasa Mandarin karena memiliki bunyi pelafalan lebih dari satu, sehingga cepat menimbulkan kesalahan berbahasa. Penelitian ini merupakan penelitian deskriptif yang menganalisis kesalahan berbahasa pada tataran fonologi bahasa Mandarin yang dilakukan oleh mahasiswa semester akhir program studi pendidikan bahasa Mandarin. Penelitian ini bertujuan untuk mengungkap bentuk-bentuk kesalahan berbahasa dan faktor-faktor penyebabnya. Data penelitian diperoleh dengan menggunakan tes dan wawancara langsung kepada mahasiswa bahasa Mandarin dari hasil tes pelafalan dan wawancara kepada mahasiswa. Dari analisis kesalahan berbahasa ditemukan empat jenis kesalahan, meliputi kesalahan pelafalan akibat perubahan nada, kesalahan pelafalan akibat perubahan konsonan, kesalahan pelafalan akibat perubahan vokal, dan kesalahan pelafalan akibat perubahan vokal dan konsonan secara bersamaan. Dari keempat jenis kesalahan pelafalan tersebut, yang memiliki tingkat kesalahan paling tinggi adalah kesalahan pelafalan akibat perubahan nada. Faktor-faktor penyebab kesalahan pelafalan pada huruf polifonik adalah kompleksitas bunyi pelafalan dari huruf polifonik itu sendiri dan penguasaan kaidah serta kosakata bahasa Mandarin yang kurang memadai. Dalam pembelajaran bahasa Mandarin, huruf polifonik tidak dibahas secara eksplisit per huruf tetapi per kosa kata, jadi tergantung pada ketajaman siswa untuk mengingat bunyi pengucapannya.

I. INTRODUCTION

Awareness of the importance of learning foreign languages is increasing in this era of globalization. Foreign languages have become an unavoidable necessity so that someone can exist and develop in the world of work. Because quite a few national and international companies require employees to master at least one foreign language. Recently, apart from English, many Indonesians are studying Mandarin. Moreover, as China's economy strengthens internationally, Mandarin is increasingly popular and in demand among the general public.

Every language has rules or regulations that apply to its use, such as grammar, vocabulary, how to use it, ethics of use, etc. To master a language, you need to go through a learning process. Foreign language learning is the process of students carrying out linguistic activities by the linguistic rules of the target language, both in

the school environment and other teaching institutions. However, every effort to master a language, whether mother tongue or first language (for example, Indonesian) or a foreign language or second language (for example, Mandarin), cannot escape the occurrence of language deviations or errors. As stated by Aksan, language errors are closely related to both first-language and second-language teaching (Aksan, 2013).

Language deviation or error is an event that is inherent in every use of language, both orally and in writing (Simorangkir et al., 2023). According to language learning studies, language deviations or errors are divided into two, namely errors and mistakes. Baradja (in Suwarna Pringgawidagda) stated that errors are irregularities or deviations that are steady, systematic, and reflect the learner's competence at a particular stage. The type of error varies according to the level of the learner because the error reflects the learner's language patterns when learning the target language. Meanwhile, errors are deviations that are not steady, not systematic, and do not reflect the learner's competence at a particular stage. This error is related to learner performance, caused by physical factors such as fatigue and lethargy or other psychological factors such as sadness, joy, or overwhelming anger (Pringgawidagda, 2002).

In line with this opinion, Tarigan also said that competency factors cause mistakes, whereas performance factors generally cause mistakes. Mistakes are more random, meaning they can occur at any linguistic level, while errors usually occur consistently and systematically (Tarigan & Tarigan, 2011).

Likewise, in studies of learning Mandarin as a foreign language, language errors are also divided into two concepts, namely errors and errors. A mistake refers to an unintentional error. For example, when someone initially wants to say A, but accidentally or with a slip of the tongue says B. This is an unexpected and irregular mistake, which can be made by anyone, even people who have good Mandarin language skills, so they cannot reflect the language competence of the speaker. Meanwhile, errors are deviations from correct language rules, which are systematic and regular and can reflect the speaker's language competence. For example, when someone is learning English (as a foreign language/second language) because they are influenced by Mandarin (as their first language), they often forget that in simple present tense sentences for the third person singular, the verb always ends with "s," which causes errors—language (Zhang, 2018).

So from the definition above, it can be concluded that Mandarin language errors can also be categorized into "mistakes" and "mistakes" where Mandarin language errors are inconsistent and influenced by the performance of the Mandarin speaker so that the errors made by the speaker do not reflect whether their competence is good or not. On the other hand, language errors are consistent and systematic, which can reflect the speaker's Mandarin language competence.

Based on the taxonomy, linguistic language errors include phonology, morphology, syntax, semantics, lexicon, and discourse errors. Phonological errors relate to pronouncing language sounds (Pringgawidagda, 2002). According to Chaer, phonology is a part of linguistic studies that studies, discusses, and analyzes speech sounds produced by the human speech apparatus (Chaer, 2012). So, phonological errors can be studied based on the sound of a person's pronunciation or pronunciation. Soraya stated that the problem in language learning that generally arises in the spoken form is the occurrence of pronunciation errors (Dinamika, 2022). These pronunciation errors also occur in Indonesian students who are studying Mandarin.

Mandarin is a type of language that has a morphemic script system, where one grapheme represents one word or letter. The uniqueness of Mandarin letters is that each letter has three elements, namely the form of the letter, the aspect of pronunciation, and the component of meaning; for example, the letter "我" (its shape) has the pronunciation "wǒ" and the meaning "I." In general, one letter has one pronunciation, except polyphonic letters. Polyphonic letters are Chinese letters recorded in more than just one type of pronunciation (Shao, 2007). Based on the List of Commonly Used Characters in Modern Chinese (1988) issued by the Chinese government, the number of Chinese characters frequently used is around 7000. Among these 7000 letters, 625 polyphonic letters, or about 9%. Polyphonic letters have more than one pronunciation (J. Zhou, 2005). Polyphonic letters have two main characteristics: the same letter has two or more pronunciations, and different pronunciations have different meanings. Hu. L (2003) Procedures for reading modern polyphonic and ancient polyphonic letters in common nouns and Mandarin proverbs, ancient Chinese names, and regional names also have different pronunciations.

From these characteristics, the advantage of polyphonic letters is that one letter can have several different meanings and pronunciations, saving the number of Chinese letters that already have quite a large capacity. For example, the letter "尾" has two pronunciations, namely "wěi and yǐ"; The letter "参" has three pronunciations, namely "cān, cēn, and shēn" and the letter "差" has four pronunciations, namely "chā, chà, chāi, and cī." These different pronunciations also represent different meanings, so one polyphonic letter has more than one meaning. Liu, Y. (2012) Variations in pronunciation in one polyphonic letter can be distinguished from changes in tone, consonant sounds, vowel sounds, or changes in consonant and vowel sounds simultaneously. Even though the double system, carried out by polyphonic letters, has its advantages, it makes it easy for errors to arise in its use in learning Mandarin, especially in pronouncing these polyphonic letters. Therefore, it is unsurprising that polyphonic letters are one of the difficulties Mandarin language learners face.

Researchers who are involved in the field of Mandarin language learning are still developing. It can be seen from research conducted by Liu Yunhan entitled Inspecting the Pronunciation of Chinese Homographs, explaining that to overcome the difficulties caused by diverse and complex polyphonic letters, it is necessary to have a clear understanding of the characteristics of polyphonic letters, the types of pronunciation changes and the situations in which they are used (Liu, 2012). Dingping, with a research entitled "A Research on Foreign Students' Pronunciations of Chinese Homophones," also stated that in learning Mandarin, foreign students cannot avoid problems with polyphonic letters, so it is necessary to find effective strategies and methods to help students learn polyphonic letters. And Mandarin well (Ding, 2012). Furthermore, Chen Yufei's research entitled "Study on the Learning and Teaching Polyphones for Foreign Students" concluded that foreign students who study polyphonic letters often make mistakes in pronunciation and understanding the meaning of polyphonic letters, thus hindering the increase in Mandarin language proficiency. Therefore, it is necessary to investigate students' learning situations in-depth and summarize appropriate teaching and learning methods (Chen, 2016).

The research results above are more general; research then continues to develop towards more specific research subjects, namely students from certain countries, like Kuang Haibao's research entitled "Research on Chinese polyphonic characters for Indonesian learners," which analyzes the problem of polyphonic letter pronunciation errors that occur among Indonesian students studying Mandarin (Kuang, 2014). Next, Anjun conducted research on Chinese language learners from Russia with the research title Investigation and Analysis of Chinese Polyphonic Characters Acquired by Russian Foreign Students, which surveyed the mastery of polyphonic letters and conditions of polyphonic letter pronunciation errors among Russian students (An, 2018).

They are seeing that similar conditions of pronunciation errors also occurred in students of the Mandarin language education study program, F.K.I.P., Tanjungpura University. So, this research was carried out to identify the mistakes in pronouncing polyphonic letters and find the factors that cause these errors. So, this research is fundamental, as people have yet to research polyphonic pronunciation errors in Indonesia. The researcher hopes that the results can be used as a valuable reference to improve pronunciation and avoid similar mistakes in the future so that they can use Mandarin well and correctly.

II. METHOD

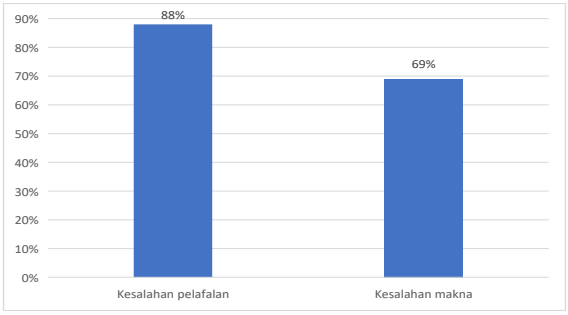
The research aims to utilize the qualitative descriptive research method. The study participants are 26 students in their final semester of the Mandarin Language Education program at the Faculty of Teacher Training and Education, Tanjungpura University. These students were selected purposefully as they have already acquired a decent level of Mandarin language proficiency after studying the language for three and a half years on campus.

Data collection techniques through pronunciation tests and direct interviews with students. The pronunciation test consists of 20 polyphonic letters taken randomly from a list of frequently used Mandarin letters, including: 便, 差, 大, 得, 都, 给, 还, 好, 和, 会, 觉, 乐, 了, 没, 哪, 难, 行, 长, 着, 重. Based on the guidebook issued by the Ministry of Education of the People's Republic of China, the National Language and Writing Working Committee, and the Chinese Pronunciation Review Committee in 1985 (Putonghua Yidu Ci Shen Yi Biao Mandarin Pronunciation Table for Different Pronunciation Words) (Zhou, X.Y. (2002). Respectively -Each of these polyphonic letters is matched with other words to form an understanding or phrase or sentence so that it can make a difference in

determining the correct pronunciation. The data analysis technique includes the introduction stage, data sorting, and data analysis in the form of pronunciation sounds spoken by students, then sorting and analyzing the data identified based on the type of error. After that, it is described to form conclusions and conclusions in this research.

III. RESULT AND DISCUSSION

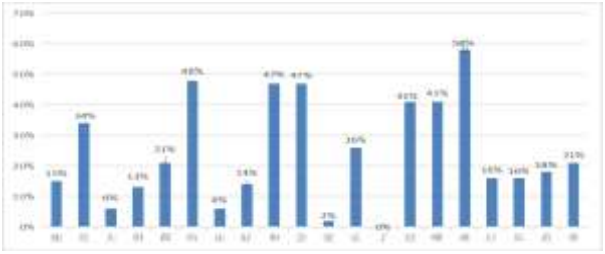
Before examining the gathered research data, the researcher presents a general overview of students' perspectives on learning polyphonic letters. Nearly all students recognize the significance of learning polyphonic letters as it can enhance their Mandarin language proficiency. Regarding the complexity of comprehending polyphonic letters, students believe it to be relatively straightforward. Roughly 73% of students reported encountering polyphonic letters in their Mandarin learning materials. However, these letters are not discussed separately but in the context of vocabulary, requiring students to be diligent in recalling them. Despite their efforts, students sometimes need help correctly using polyphonic letters, primarily through mispronunciation and misunderstandings. The following graph illustrates the percentage of students based on the type of error:



Picture 1. Types of errors in learning and using polyphonic letters

From the graph above, pronunciation errors appear more frequently in students' learning and use of polyphonic letters.

As is generally known, when studying a Chinese letter, you must examine the letter's three elements: the shape of the letter, the sound of the pronunciation, and the meaning. Most of the pronunciation sounds that are studied are only one, especially in the practice of learning Mandarin for beginners. What about learning polyphonic letters that have more than one pronunciation? It is the same as Mandarin letters, which only have one pronunciation. Polyphonic letters are not explicitly taught to beginner students and are treated the same as other letters. It's just that as the introduction of new vocabulary increases, other pronunciation sounds slowly appear and are learned individually. So, the mastery of each pronunciation sound per polyphonic letter also varies. The following is a graph that depicts the average percentage of errors in pronunciation of the sounds of each polyphonic letter.



Picture 2. Average percentage of pronunciation errors per polyphonic letter

From the graph above, you can see the average percentage of errors in pronouncing each polyphonic letter. The best mastery of pronunciation is the polyphonic letter 了. This letter is elementary and is often taught when learning Mandarin. Meanwhile, a relatively high percentage of errors occurred in the letters 难, 给, 和 and 会, which had reached 50%.

Next, the researcher identified distortions in the four pronunciation changes proposed by Zhou Jian. So the research data was grouped into four parts, including five polyphonic letters that experienced changes in tone, namely 难, 好, 差, 和, and 得; three polyphonic letters changed their consonant sound, namely 便, 长, 重; 11 polyphonic letters experience vowel sound changes, namely 差, 大, 得, 都, 还, 和, 觉, 了, 没, 哪, 着 and four polyphonic letters that experience consonant

and vowel sound changes simultaneously, namely 行, 给, 乐, 会. The following is a description of the results of the analysis of language errors in polyphonic letters:

1. Language errors due to changes in tone in polyphonic letters.

   Mandarin has 21 consonant sounds (known as shengmu), 39 vowel sounds (known as yunmu), and four tones (Jiang, 2009). The four tones in question are tone one (known as yin pin), tone two (known as yang pin), tone three (known as shang sheng), and tone four (known as qu sheng)(X. Zhou, 2009

). Tone is one of the difficulties international students face when learning Mandarin (Jiang, 2009).

Changes in tone in polyphonic letters can occur between one tone becoming another tone; for example, the letter 少 in the vocabulary 多少 (pronounced duō shǎo) uses a third tone, there is a change to a fourth tone in the vocabulary 少年 (pronounced shào nián). Also, sometimes, you encounter light tones (qing sheng) when learning Mandarin. Light tones are not one of the tones; they are only a result of changes in intonation and the length of the sound being pronounced. Therefore, the change in tone referred to here is not only from one tone to another; it also includes a change from one tone to a light tone.

The polyphonic letters that experienced changes in tone in this study were 难, 好, 差, 和 and 得. The letter 难 has three pronunciation sounds: nán, nàn, and nan. The letter 好 has two pronunciation sounds, namely hǎo and hào. The letter 差 has four pronunciation sounds, namely chā, chà, chāi, and cī; of these four sounds, which include changes in tone, are chā and chà. The letter 和 has three pronunciation sounds, namely hé, hè, and huó, of these three sounds which include changes in tone, are hé and hè. The polyphonic letter "得" has three pronunciation sounds, namely dé, děi and de; of these three sounds, which include changes in tone, are dé and de. The following is a table of the percentage of students' pronunciation errors due to changes in tone:

Table 1. Percentage of pronunciation errors due to changes in tone

Polyphonic Letters	Vocabulary	Pronunciation	% Error
难	难过 (pronounced nán guò) means sad	*nán*	31%
	苦难 (pronounced kǔnàn) means misery	*nàn*	50%
	困难 (pronounced kùnnan) means difficulty	*nan*	92%
好	好人 (pronounced hǎorén) means good person	*hǎo*	0%
	爱好 (pronounced àihào) means hobby	*hào*	12%
	好奇 (pronounced hàoqí) means want to know	*hào*	31%
差	差别 (pronounced chābié) means difference	*chā*	11%
	差不多 (pronounced chàbuduō) means almost, more or less	*chà*	15%
和	和平 (pronounced hépíng) means peace/peace	*hé*	0%
	应和 (dibaca *yìnghè*) arti menanggapi/merespon	*hè*	96%
得	觉得 (pronounced juéde) means feeling/thinking	*de*	0%
	得到 (pronounced dédào) means to get/acquire	*dé*	31%
Average error percentage			31%

Of the five polyphonic letters above, the best note mastery is 好(hǎo), 和(hé), and 得(de) with zero percent errors each, followed by 差(chā) with an error rate of 11% and 难(nán) with an error rate of 31%. These five pronunciation sounds are the initial pronunciation sounds. The pronunciation sound first recognized and studied per polyphonic letter is called the initial pronunciation sound (in this study). If studied etymologically, the initial pronunciation sound in question is not necessarily the original pronunciation sound that accompanies the polyphonic letter. This research does not examine the order of each pronunciation sound etymologically but instead is based on the order of the pronunciation sounds first studied by students. So, it can be concluded that the first impression of learning the pronunciation sounds of polyphonic letters greatly influences memory and usage habits.

Vocabularies is very high, almost 100%. Students mispronounce the letter 难 because they ignore the rules for changing to a light tone. Meanwhile, the pronunciation error in the letter 和 is because the vocabulary 应和 is not a vocabulary that often appears or is used in daily Mandarin conversations, resulting in most students not being familiar with this vocabulary. The same thing can also be seen in the vocabulary 爱好 and 好奇. When compared, even though the 好 in these two vocabularies is pronounced hào, it is clear that the error rate of 爱好（12%）is lower than the error rate of 好奇(31%) because the vocabulary 爱好 is better known to students. So, it can be concluded that the level of

vocabulary recognition influences mastery of polyphonic letter pronunciation sounds.

2. Language errors due to changes in consonants in polyphonic.

The consonant sounds in Mandarin are pretty diverse, including b, p, m, f, d, t, n, l, g, k, h, j, q, x, zh, ch, sh, r, z, c, s, there are a total of 21 pieces. A shift in tone sometimes accompanies the consonant changes that occur in pronouncing polyphonic letters. An example that experiences a change in tone is the letter 奇; in the vocabulary 奇怪 (pronounced qíguài) and 奇数 (pronounced jīshù), it is clear that the change in the consonant "q" to "j" is accompanied by a change in tone two to tone four. An example that does not experience a shift in tone is the letter 咖; in the vocabulary 咖啡 (pronounced kāfēi) and 咖喱 (pronounced gālí), there is a change in the consonant "k" to "g," but without a change in tone, it remains one tone.

The polyphonic letters that experienced consonant changes in this study were 便, 长, and 重, each with two pronunciation sounds. The letter 便 has the pronunciation sounds biàn and pián. The letter 长 has the pronunciation sounds cháng and zhǎng. The letter 重 has the pronunciation sounds zhòng and chóng. The following is a table of the percentage of students' pronunciation errors due to changes in consonant sounds:

Table 2. Percentage of pronunciation errors due to consonant changes

Polyphonic Letters	Vocabulary	Pronunciation	% Error
便	便宜 (pronounced piányi) means cheap	*pián*	8%
	方便 (pronounced fāngbiàn) means easy/free	*biàn*	0%
	便利 (dibaca biànlì) arti mudah / memudahkan	*biàn*	38%
长	长久 (pronounced chángjiǔ) means long term/permanent	*cháng*	8%
	长大 (pronounced zhǎng dà) means to grow up / grow up	*zhǎng*	23%
重	重要 (pronounced zhòngyào) important meaning	*zhòng*	0%
	重新 (pronounced chóngxīn) means once again/return again	*chóng*	42%
	error percentage		17%

From the table above, it can be identified that changes also follow changes in the consonants of the three polyphonic letters in tone. Where the letter 便 from the pián pronunciation changes to the biàn pronunciation, the consonant "p" changes to "b", and the second tone changes to the fourth tone. In the letter 长, the pronunciation cháng changes to the pronunciation zhǎng, the consonant changes from "ch" to "zh," and the second tone changes to the third tone. In the letter 重, the pronunciation of zhòng changes to the pronunciation of chóng, the consonant changes from "zh" to "ch," and the fourth tone changes to the second tone.

Of the three polyphonic letters above, the error rate in pronunciation of 长 (cháng) and 重(zhòng) is relatively small because these two pronunciation sounds are the initial pronunciation sounds. However, the situation is somewhat different for the letter 便, where the initial pronunciation sound is pián from the vocabulary 便宜. Mastery of the pronunciation of the sound pián should be better than the sound biàn, but this is not the case. The error rate of 便宜 (piányi) is even much higher than 方便 (fāngbiàn), which is 0%. Also, compare the error rates for 方便 (0%) and 便利(38%), both of which have the pronunciation sound biàn; only the vocabulary equivalent is different. These two conditions show that the introduction of vocabulary has a more dominant influence than the influence of the initial pronunciation sound of the polyphonic letters that are first taught to students.

3. Language errors due to vowel changes in polyphonic.

Mandarin has more vowel sounds than consonant sounds, a total of 39 vowel sounds (yunmu). Mandarin vowels consist of single vowels (known as dan yunmu), combined vowels (known as fu yunmu), and nasal vowels (known as bi yunmu). There are ten single vowels: a, o, e, ê, i, u, ü, -i, -i, er. There are 13 combined vowels: ai, ei, ao, ou, ia, ie, ua, uo, üe, iao, iou, uai, uei. There are 16 nasal vowels: an, en, in, ün, ang, eng, ing, ong, ian, uan, üan, uen, iang, money, ueng, iong.

Vowel changes that occur in the pronunciation of polyphonic letters can occur between the three types of vowels mentioned above and can be accompanied by pitch changes. For example, the letter 塞, in the

vocabulary 塞子 (pronounced sāi zi) and 闭塞 (pronounced bìsè), clearly shows the change in the combined vowel "ai" to the single vowel "e," which is accompanied by a shift in the tone one to tone four.

The polyphonic letters that underwent vowel changes in this study were 还, 了, 没, 都, 觉, 大, 哪, 得, 着, 差 and 和. The letter 还 has the pronunciation sounds hái and huán. The letter 了 has the pronunciation sounds liǎo and le. The letter 没 has the pronunciation sounds méi and mò. The letter 都 has the pronunciation sounds dōu and dū. The letter 觉 has the pronunciation sounds jiào and jué. The letter 大 has the pronunciation sounds dà and dài. The letter 哪 has the pronunciation sounds nǎ and né. The letter 得 has the pronunciation sounds dé, děi and de; of these three sounds, which include consonant changes, are dé and děi. The letter 着 has the pronunciation sounds zhuó, zháo and zhe. The letter 差 has the pronunciation chā, chà, chāi and cī. The letter 和 has the pronunciation hé, hè and huó. The following is a table of the percentage of students' pronunciation errors due to vowel changes:

Table 3. Percentage of pronunciation errors due to vowel changes

Polyphonic Letters	Vocabulary	Pronunciation	% Error
还	还是 (pronounced háishi) means or/better	*hái*	0%
	还书 (pronounced huán shū) means returning a book	*huán*	11%
了	来了 (pronounced láile) means it has come	*le*	0%
	了解 (pronounced liǎojiě) means understand/understand	*liǎo*	0%
没	没有 (pronounced méiyou) means not having/having	*méi*	0%
	沉没 (pronounced chénmò) means drowning/shipwrecked	*mò*	81%
都	都是 (pronounced dōu shì) means everything	*dōu*	0%
	首都 (pronounced shǒudū) means capital	*dū*	42%
觉	睡觉 (pronounced shuìjiào) means sleep	*jiào*	0%
	觉得 (pronounced juéde) means feeling/thinking	*jué*	4%
大	长大 (pronounced zhǎngdà) means to grow up/grow up	*dà*	0%
	大夫 (pronounced dàifu) means doctor/physician	*dài*	11%
哪	哪儿 (pronounced nǎr) means where/where	*nǎ*	0%
	哪吒 (pronounced nézhā) means nezha	*né*	81%
得	觉得 (pronounced juéde) means feeling/thinking	*de*	0%
	得到 (pronounced dédào) means to get/acquire	*dé*	31%
	我得走了 (pronounced wǒ děi zǒule) means I have to go	*děi*	8%
着	看着 (pronounced kànzhe) means looking	*zhe*	4%
	睡着(pronounced shuìzháo) means falling asleep	*zháo*	38%
	着急 (pronounced zháojí) means restless/worried/anxious/in a hurry	*zháo*	27%
	穿着(pronounced chuānzhuó) means clothing	*zhuó*	23%
差	差别 (pronounced chābié) means difference	*chā*	11%
	差不多 (pronounced chàbuduō) means almost, more or less	*chà*	15%
	出差 (pronounced chūchāi) means out of town service/business trip	*chāi*	8%
	参差 (pronounced cēncī) means uneven/regular	*cī*	100%
和	和平 (pronounced hépíng) means peace/peace	*hé*	0%
	暖和 (pronounced nuǎnhuo) means warm	*huo*	8%
	和面 (pronounced huómiàn) means kneading wheat flour	*huó*	85%
	应和 (pronounced	*hè*	96%

yìng hè) means responding/respon ding	
Average error percentage	24%

From the table above, it can be identified that the vowel changes of the eleven polyphonic letters have undergone changes from single vowels to combined vowels, from combined vowels to nasal vowels, and vice versa. For example, the letter 了 changes the vowel "e" to "iao," and the letter 还 changes the vowel "ai" to "can." A change in tone accompanies some vowel changes, and some do not; for example, in the letter 没, the vowel change from "ei" to "o" is accompanied by a change in tone two (méi) to tone four (mò). Meanwhile, the letter 大, which has changed the vowel "a" to "ai" but is not accompanied by a tone change, remains the same fourth tone, namely the pronunciation sounds dà and dài.

Apart from that, the table data also shows that students have mastered the initial pronunciation sounds of each polyphonic. It can be seen from the percentage of errors in the letters 还(hái), 了(le), 没(méi), 都(dōu), 觉(jiào), 大(dà), 哪(nǎ), 得(de), and 和(hé) each with zero percent error, then 着(zhe) at 4% and 差 (chā) at just 11% error.

For the polyphonic letter 着 , the percentage of pronunciation errors outside the initial pronunciation sound is relatively stable, with an average of around 30%. Meanwhile, several other polyphonic letters with more than two pronunciation sounds, namely 得, 差, and 和, found significant percentage differences. In the polyphonic letter 得, mastery of the pronunciation sound děi is better than dé. There are only 8% pronunciation errors; this is because the pronunciation sound děi is only used in sentence patterns that express the meaning of must, so its use is very different from the initial pronunciation sound and makes it easier for students to master it.

sounds, such as chà with an error percentage of 15% and cī with a very high error percentage, namely 100%. This is influenced by the level of students' familiarity with the different 差不多 and 参差 vocabulary. The vocabulary 差不多 includes vocabulary that is often used in daily conversation, while 参差 is vocabulary that is rarely used and appears more often in advanced-level reading texts. Almost the same condition also occurs with the polyphonic letter 和; a very high percentage of errors in the pronunciation of huó is 85%, and hè is 96%. From this percentage value, it can be seen that the introduction of the vocabulary 和面 and 应和 is still feeble. These two words are also not words that often appear in everyday conversation.

4. Language errors due to changes in consonants and vowels simultaneously in polyphonic letters.

Polyphonic letters that experience consonant and vowel changes simultaneously in this study are 行, 给, 乐, and 会, each of which has two pronunciation sounds. The letter 行 has the pronunciation sounds xíng and háng. The letter 给 has the pronunciation sounds gěi and jǐ. The letter 乐 has the pronunciation sounds yuè and lè. The letter 会 has the pronunciation sounds huì and kuài. The following is a table of the percentage of student pronunciation errors due to changes in consonants and vowels simultaneously:

Table 4. Percentage of pronunciation errors due to consonant changes

Polyphonic Letters	Vocabulary	Pronunciation	% Error
行	行人 (pronounced xíngrén) means pedestrian	*xíng*	35%
	银行 (pronounced yínháng) means bank	*háng*	0%
给	给钱 (pronounced gěi qián) means giving money	*gěi*	0%
	给予 (pronounced jǐyǔ) means to give/give	*jǐ*	96%
乐	快乐 (pronounced kuàilè) means happy/joyful	*lè*	0%
	乐观 (pronounced lèguān) means optimistic	*lè*	15%
	music音乐 (pronounced yīnyuè) means music	*yuè*	0%
	乐器 (pronounced yuèqì) means musical instrument	*yuè*	42%
会	开会 (pronounced kāihuì) means holding a meeting/meeting	huì	8%
	会计 (pronounced kuàiji) means accounting/accountan	kuài	85%
	Average error percentage		28%

From the table above, it can be identified that changes in tone do not accompany changes in vowels and consonants simultaneously in four polyphonic letters. As with the letter 会, which was initially pronounced huì to kuài, you can see the change in the consonant from "h" to "k" and the change in the vowel "ui" to "uai"; there is no change in tone at all, namely it is still the fourth tone.

Of the four polyphonic letters above, the best tone mastery is the initial pronunciation sound of the polyphonic letters 给(gěi) and 乐(lè) with zero percent errors, then 会(huì) with only 8% errors. Except for the letter 行, which has the initial pronunciation sound xíng has a higher error rate than the pronunciation sound háng in the vocabulary 银行. The letter 行 with the pronunciation sound háng in the vocabulary 银行 is better known to students than the influence of the initial pronunciation sound xíng. The highest error rate occurred in the pronunciation of the vocabulary 给予 (96%), 会计(85%), and 乐器(42%) because these three vocabularies do not include language that often appears or is used in everyday Mandarin conversation.

IV. CONCLUSIONS AND SUGGESTIONS

A. Conclusion

Based on the results of research on the pronunciation sounds of Mandarin language education study program students, pronunciation errors are present at the phonological level. Students made this error when pronouncing polyphonic letters. The types of errors made include pronunciation errors due to changes in tone, pronunciation errors due to changes in consonants, pronunciation errors due to changes in vowels, and pronunciation errors due to changes in vowels and consonants simultaneously. Of these four types of pronunciation errors, the one with the highest error rate is the pronunciation error due to changes in tone. Several factors influence pronunciation errors in polyphonic letters, including the complexity of the pronunciation sounds in polyphonic letters, mastery of Mandarin linguistic rules, and vocabulary mastery. Students pay less attention to Mandarin language rules, such as light tone changes, and are more accustomed to pronouncing the initial pronunciation sounds in polyphonic letters. Apart from that, based on interviews with students, it is known that students know the importance of learning polyphonic letters because mastering them can help improve Mandarin language competency. However, even though students have studied Mandarin for three and a half years, language errors still occur. In learning Mandarin, polyphonic letters are not explicitly discussed per letter but are discussed per vocabulary, so it depends on the student's astuteness to remember them. This condition shows that polyphonic letters still need more attention when teaching Mandarin. Therefore, it is hoped that more experts will research the analysis of language errors in phonology, which can provide suggestions for improving Mandarin learning.

B. Suggestion

Pembahasan terkait penelitian ini masih sangat terbatas dan membutuhkan banyak masukan, saran untuk penulis selanjutnya adalah mengkaji lebih dalam dan secara komprehensif tentang Analysis of Language Errors in the Pronunciation of Chinese Polyphonic Letters.

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