Chinese Character Reading among Adult Chinese Heritage Language (CHL) Learners and Non-CHL Learners in Vietnam

by

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Statement of Originality

I, CHENG, Yaxiao, hereby declare that I am the sole author of the thesis and the material presented in this thesis is my original work except those indicated in the acknowledgement. I further declare that I have followed the University's policies and regulations on Academic Honesty, Copyright and Plagiarism in writing the thesis and no material in this thesis has been submitted for a degree in this or other universities.

Abstract

Reading Chinese characters is essential to Chinese language learning, particularly in Chinese literacy development. Abundant studies have focused on the Chinese character acquisition by Chinese children and CSL/CFL (Chinese as a second/foreign language) learners, but a few on CHL (Chinese as a heritage language) learners to date. The purpose of this study is to investigate whether there are developmental differences in reading Chinese characters among adult CHL and non-CHL learners at the elementary, intermediate, and advanced Chinese levels in Vietnam, and if so, whether their Chinese character reading achievement could be affected by L2 Chinese learning motivation and the frequency of attending extracurricular Chinese activities, and whether there are influences of the CHL and non-CHL learners' perspectives of the class instruction and textbooks on their Chinese character reading achievement. This study adopted quantitative and qualitative methods with a cross-sectional design to probe into the research questions by conducting an online Chinese character reading test and Chinese learning questionnaire with each participant. A total of 181 (89 CHL and 92 non-CHL learners) valid answer sheets were received.

The results suggest that there were commonalities and differences in the development of Chinese character reading achievement among adult CHL and non-CHL learners. Generally, the elementary CHL and non-CHL learners had the same performance in reading Chinese characters, but the CHL group obtained higher Chinese character reading scores than the non-CHL group at the intermediate and advanced Chinese proficiency levels. Moreover, the average L2 Chinese motivation and the frequency of extracurricular Chinese activity engagement of the CHL learners were significantly higher than the average motivation and

frequency of the non-CHL learners. Furthermore, for both CHL and non-CHL groups, the learners with higher L2 Chinese learning motivation and engagement frequency of extracurricular Chinese activities tended to have better Chinese character reading achievement, and the students with higher motivation to learn Chinese generally had a higher frequency of attending extracurricular Chinese activities. The results suggest a positive predictive effect of L2 motivation on the Chinese character reading achievement, with the extracurricular Chinese engagement frequency as a significant mediator. On the other hand, the relationships among the L2 Chinese character reading achievement, L2 motivation, and the frequency of extracurricular Chinese activity engagement in the non-CHL group were relatively stronger than that among the CHL group. Additionally, the students' views on Chinese character instruction may also influence their character learning achievement. The CHL learners seemed to be more interested in learning Chinese characters' history, culture, and knowledge. The students who embraced more positive attitudes toward learning Chinese characters tended to have more confidence in reading Chinese characters and gain better achievement. Also, both CHL and non-CHL learners held some negative views of Chinese character instruction in their current textbooks. Pedagogical implications of teaching Chinese characters to the CHL and non-CHL learners are discussed. Overall, this study is committed to providing some innovative insights into learning to read Chinese characters among adult CHL and non-CHL learners in Vietnam, both in the academia and practical realm.

Keywords: CHL and non-CHL learners in Vietnam, Chinese character reading, L2 Chinese motivation, extracurricular Chinese activities, views on Chinese character instruction

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Table of Contents

List of Abbreviations

CFL	Chinese as a foreign language
CHL	Chinese as a heritage language
CSL	Chinese as a second language
HL	Heritage language
L1	First language
L2	Second language
L2MSS	L2 Motivational Self System
Non-CHL	Non Chinese heritage language
RQ	Research question

List of Figures

List of Tables

Chapter 1: Introduction

1.1 Background of the study

Chinese characters can be seen as the soul of this language. They are not only the basic units of the Chinese writing system, recording oral Chinese, but also a symbol of Chinese culture, bearing over 5,000 years of history. Reading Chinese characters is essential to Chinese language learning, particularly in Chinese literacy development. It is one crucial indicator of one's Chinese language ability. Chinese character identification plays an important role in reading as it first is the result of the visual print decoding and meanwhile is the source of sentence processing, or the preparation for reading the text accurately and fluently (Perfetti, 1999). Learning to read Chinese characters is as important as learning to recognize the letters and words in English. If the learners did not know the commonly used Chinese characters, their study journey of the Chinese language would remain stagnant.

However, learning Chinese characters has long been assumed as a difficult task for the learners of other languages, especially the alphabetic language users. Compared with the linear scripts of alphabetic languages, Chinese writing system has very different features, such as the deep orthography, complex structures, and the unclear relationship between Chinese characters and words, etc. All these features make it challenging to master a great number of Chinese characters. On the other hand, in spite of such enormous Chinese characters, one can read most Chinese materials in daily life after learning those commonly used modern Chinese characters. The State Language Commission, Ministry of Education of

the People's Republic of China published *Xiandai hanyu changyong zibiao* [Basic Vocabulary Table of Modern Chinese Characters] in 1988, which listed 2,500 commonly used Chinese characters covering 97.97% of the daily information as well as another 1,000 secondary common characters covering 1.51% (p. 7). Also, the *Commonly Used Chinese Characters 581* "can cover with 80% characters on newspapers, the Internet, radio and TV programs" (Wang, 2006, p. I). The *800 Chinese Characters* (2009) is specially compiled for overseas Chinese learners of other languages to learn the 800 commonly used Chinese characters in daily life. Each Chinese character is equipped with example vocabulary and sentences in this dictionary. In addition, these common Chinese characters usually have a solid ability to construct complex characters (e.g., "方/fāng/ [square]" → "访/fǎng/ [visit]", "放/fàng/ [release]", "房/fáng/ [house, room]", "防/fáng/ [guard against]", "芳/fāng/ [fragrant]", etc.), and to form a range of words (e.g., "方/fāng/ [square]" → "方法/fāng fǎ/ [method]", "方向/fāng xiàng/ [direction]", "方便/fāng biàn/ [convenient]", "东方/dōng fāng/ [east]", "大方/dà fang/ [generous]", etc.). Recently, the newest *Chinese Proficiency Grading Standards for International Chinese Language Education* stipulates that L2 learners can recognize 3,000 Chinese characters when they reach the advanced level (Liu et al., 2020). Moreover, more than 80% of the modern Chinese characters are semantic-phonetic compounds (Zhou, 1978), in which we can find some regular rules to facilitate the learning process. Viewed this way, learning to read Chinese characters seems not to be so hard.

According to *Chinese Proficiency Grading Standards for International Chinese Language Education (GF 0025-2021)* (2021, pp. 2-8), L2 learners are required to recognize more Chinese characters than to write them. In today's digital era, people spend more time typing words than writing. Albeit it seems that writing a lot of Chinese characters is not as necessary

as before, learning to read in Chinese is still very important. Recognizing Chinese characters is the first step to reading in Chinese. Since reading (input) and writing (output) Chinese characters belong to two different domains of language competence as they involve different mechanisms, the scope of this study is confined to reading Chinese characters.

Learning to read Chinese characters is a dynamic developmental process in which the learners need to grasp much analytic processing knowledge, such as identifying the structural types, numbers and patterns of strokes, semantic and phonetic radical knowledge, component combination regularities, the function of word-generation, etc. Considerable studies have investigated the Chinese character learning by college students of lower Chinese proficiency in the USA or the international students at Chinese tertiary institutions, but there is a scarcity of research paying much attention to the learners of diverse backgrounds, such as the Chinese heritage language (CHL) learners and Chinese as a foreign language (CFL) learners in other countries and regions (Ke, 2020). Therefore, this study is committed to investigating the Chinese character reading development with an eye to the adult CHL and non-CHL learners in Vietnam. The non-CHL learners herein refer to those who are learning Chinese as a foreign language but have no relation to Chinese origins.

There are two main reasons for focusing on Vietnam: First, a significant number of ethnic Chinese are living in southern Vietnam, and many Vietnamese students are learning Chinese as a second or foreign language. Second, the modern Vietnamese people use the alphabetic writing system (e.g., Chữ Hán [Chinese characters], sách [book], etc.), which is similar to French or English. Although their written scripts are different from Chinese characters in configuration, many Sino-Vietnamese words have similar pronunciation and meaning to the words in Chinese. Thus, the status-quo of their Chinese character learning is worthy of great

attention.

Culturally and historically, Chinese language education has a long history in Vietnam. Vietnam is one of the countries in the “Chinese cultural circle”, but Vietnamese locals feel much difficulty in learning Chinese characters because of their alphabetic writing system. In ancient times, Vietnamese people had borrowed Chinese characters to create their own square characters. However, due to the historical, political, and practical reasons, Vietnamese characters had been superseded by the alphabetic writing system since the later stage of the 19th century (Chen, 2018). Nowadays, some Chinese characters are still seen in the ancient architecture in Vietnam. If the young generations want to know about their ancestral history, they will learn the ancient characters to a great extent. This could be the cultural and motivational considerations for choosing Vietnamese students in this study.

Practically, most teachers and students usually pay more attention to Chinese communication skills rather than Chinese character learning (Guan, 2011; Zhou, 2019). Through several field visits, Zhou (2019) found that most Vietnamese students at universities and language training institutes had less access to a large number of Chinese characters, and they usually developed listening and speaking skills first, followed by reading and writing skills. Furthermore, Chinese character instruction is often mixed with the vocabulary and conversation learning at most schools. Many local teachers only spend a short time introducing the key Chinese characters appearing in the conversations in textbooks but ignore illustrating the features of Chinese characters, such as the combination rules of character components (Li, 2011; Wang & Zhu, 2011).

In the use of teaching materials, there is a shortage of appropriate textbooks and workbooks

for the local students to learn Chinese characters. The institutions usually adopt textbooks written in mainland China, Hong Kong or Taiwan, and many local Chinese teaching materials are somewhat out-of-date (Chen, 2018). Therefore, with the growing number of Chinese language learners in Vietnam, many current textbooks and workbooks have failed to meet the high quality and suitability of learners' demands. Notwithstanding there are some excellent teaching materials that combine with the local Vietnamese culture, numerous textbooks are topic-oriented with less focus on systematic Chinese character instruction. Li (2019) analyzed one typical L2 Chinese textbook, Experiencing Chinese-Living (also used to teach college students in this study) and investigated the users' satisfaction via surveys and interviews. The author found that the Chinese character reading appears in authentic contexts and is all topic-related words. Still, only 53.88% of students considered that this section was helpful to their Chinese character learning.

Based upon the extant studies on Vietnamese students, it seems that the current L2 Chinese character instruction and textbooks are waiting for improvement and renewal. The previous research focused more on the teaching pedagogies and the analysis of textbook contents, but a majority of them seem to be too general to reap a deep understanding of the Chinese character learning by CHL and non-CHL learners in Vietnam. Moreover, some studies on the learners' perspectives of Chinese character instruction and textbooks seldom considered the students' complex backgrounds. In other words, the views of the CHL and non-CHL learners tended to be intermingled in these studies.

When it comes to L2 Chinese learners' backgrounds, the commonalities and differences between the CHL and non-CHL learners cannot be neglected. Both CHL and non-CHL learners grow up in a non-Chinese speaking country or region and learned Chinese as a

second or foreign language. At school, they usually have Chinese classes in one classroom and seldom use Chinese after class. Some universities have set up separate classes for CHL and non-CHL learners in recent years as more and more scholars have indicated the differences between the two groups of learners. CHL learners could differ from non-CHL learners regarding their language development, cultural contexts, and sociopsychological factors. Broadly speaking, CHL learners usually have better Chinese aural and oral skills than their non-CHL counterparts, and their knowledge of Chinese characters and vocabulary might expand rapidly during the Chinese learning period. They are inclined to have more interest in their family connections, Chinese history, culture, and society (Guo & Wang, 2018; Luo et al., 2019). Also, the CHL learners' identity seems more complex than non-CHL learners. Their desire for connections to the heritage culture plays a vital role in the Chinese heritage language development (He, 2006). In other words, due to the family influence, the CHL learners' L2 motivational orientations in learning Chinese and their learning environment outside the classroom could be different from the non-CHL learners to some extent.

Taking the above research backgrounds into consideration, I have great motivation and enthusiasm to investigate the Chinese character reading development of the CHL and non-CHL students in Vietnam. Speaking of my personal experience, I used to be a Chinese teacher abroad. I encountered some issues like students' discouragement in learning Chinese characters, the mixed classrooms of the CHL and non-CHL learners, a shortage of appropriate local textbooks for learning Chinese characters and meeting the different needs of CHL and non-CHL learners, etc. One of my good friends, a local Vietnamese teacher of Chinese, also told me about such problems. These personal reasons have convinced me of my research interests in this topic, especially with an eye to the Chinese character reading achievement of CHL and non-CHL learners at the different learning phases. And I want to explore whether

there are influences of individual differences and their perspectives of Chinese character instruction on the development of Chinese character reading achievement.

1.2 Statement of problems and research questions

In light of the study background and my research interests, several problems are waiting for investigation in this study. A plethora of studies have yielded abundant findings in Chinese character acquisition by CSL/CFL learners in terms of various Chinese character knowledge or awareness, but we know little about the conditions of CHL learners. Few extant studies systematically compared the Chinese character reading development between the CHL and non-CHL learners. Moreover, previous studies suggest that the CHL and non-CHL learners are found to be different in Chinese language development, L2 motivation, and learning environment under their respective social and family contexts. Hence, could such individual variances affect the development of their learning achievement in reading Chinese characters? Additionally, the CHL and non-CHL learners receive the same Chinese instruction and use the same textbooks at some universities. With respect to the formal Chinese character teaching and learning opportunities, do the CHL and non-CHL learners have different views? And could their perspectives on class and textbook Chinese character instruction influence the Chinese character reading outcomes?

To investigate these problems, I would like to raise three specific research questions:

(1) Are there developmental differences in learning Chinese character reading among adult

CHL and non-CHL learners in Vietnam? If yes, what are the differences and commonalities?

The first research question sets the research scope to the Chinese character reading, including the single Chinese character reading and two-character word reading. There are two main reasons for including the two-character word reading: One is the close relationship between Chinese characters and words, and there are thousands of disyllabic vocabularies in modern Chinese. Another reason is that L2 Chinese learners usually learn Chinese characters from the topic words in their textbooks. Moreover, the research subjects are the CHL and non-CHL college students of different Chinese levels in southern Vietnam. Their Chinese proficiency level was determined by the HSK test (A standardized international Chinese proficiency test for non-Chinese native speakers). In this study, I intended to compare the Chinese character reading achievement of the CHL and non-CHL learners at the elementary, intermediate, and advanced Chinese levels. Since previous studies suggest differences between CHL and non-CHL learners, I raise the following two questions.

(2) Are the differences in CHL and non-CHL learners' Chinese character reading achievement affected by their L2 Chinese learning motivation and frequency of extracurricular Chinese activity engagement?

The second research question emphasizes the internal and external factors that might be related to the development of Chinese character reading achievement among the CHL and non-CHL learners. One internal factor might be L2 Chinese learning motivation. The external factor could be the individuals' informal learning contexts, such as the frequency of attending extracurricular Chinese activities, as the CHL and non-CHL learners receive the same content in their Chinese class. It is hypothesized that the CHL and non-CHL learners' L2 motivation

might affect their frequency of attending extracurricular Chinese activities. It is also hypothesized that the differences between L2 Chinese learning motivation and the frequency of extracurricular Chinese activity engagement of the CHL and non-CHL learners might affect their Chinese character reading achievement.

(3) Are the differences in CHL and non-CHL learners' Chinese character reading achievement influenced by their views on the formal instruction in class and textbooks? How?

The third research question explores the CHL and non-CHL students' Chinese character learning from the learners' self-perspectives, different from those previous studies mainly focused on learners' cognitive knowledge development in Chinese character acquisition. The learners' attitudes toward the learning content may influence their learning outcomes. Thus, we want to understand how the CHL and non-CHL students view their Chinese character instruction in class and textbooks and whether their views might influence Chinese character reading achievement. This question is related to the first two research questions and could also provide some insights for classroom instruction and textbook improvement.

1.3 Objectives and significance of the study

Based on the research backgrounds and problems, there are three primary objectives in this study. Firstly, this study aims to compare the Chinese character reading development of adult CHL and non-CHL learners in Vietnam. In general, CHL learners are linguistically, culturally, and psychologically different from non-CHL learners to varying degrees (Guo & Li, 2016;

Guo & Wang, 2018; Luo et al., 2019). Many studies have found that CHL learners tend to have better Chinese aural and oral skills than non-CHL learners, but few studies have focused on a systematic comparison between their Chinese character learning. The researchers consider that their Chinese literacy skills gradually develop during the later study period, similar to other CFL learners. Secondly, this study aims at finding the internal and external factors that might be correlated to the Chinese character reading achievement of the Vietnamese CHL and non-CHL learners at the elementary, intermediate, and advanced stage, in regard to their L2 Motivational Self System (L2MSS) in learning Chinese Mandarin and the frequency of attending extracurricular Chinese activities. Thirdly, this study expects to explore whether and how the Chinese character reading development of the Vietnamese CHL and non-CHL learners might be influenced by their views on the Chinese character instruction in class and in textbooks. By and large, study aims at providing the systematic and dedicated pedagogical implications for the Chinese character teaching and learning among the adult CHL and non-CHL learners in Vietnam, as well as suggestions for textbook improvement if applicable.

The significance of this study also lies in three aspects. Firstly, the research findings hopefully can provide a general picture of the Chinese character reading development of adult CHL and non-CHL learners in Vietnam. To my current knowledge, copious studies have paid attention to the Chinese character acquisition of Chinese children and CSL/CFL learners, but less research has been conducted in exploring the Chinese character reading of the CHL learners and comparing them with the non-CHL learners in a non-Chinese speaking environment. There is a significant number of Chinese diaspora in southern Vietnam. Many of them and their descendants learn Chinese as a second language, but usually together with non-CHL learners at school. Seeing that there is a dearth of empirical studies focusing on the

CHL learners in Vietnam, we currently have a vague understanding of their Chinese character learning development. If significant differences can be found in reading Chinese characters between the CHL and non-CHL learners, it would lead us to establish a new model of L2 Chinese character learning by the CHL and non-CHL learners, which is deficient and controversial in extant studies.

Furthermore, the quantitative and qualitative research findings can provide important pedagogical implications for the local teachers, students, and Chinese textbook developers, to help them improve the local Chinese character teaching and renew the textbooks. A plethora of research has investigated the learners' cognitive development in learning Chinese characters, while the students' individual factors and their learning contexts are somewhat neglected, to which I hope to provide sufficient data to tell the readers a more comprehensive story. It is anticipated that the CHL and non-CHL learners' perspectives of Chinese character instruction and their Chinese character reading results would enhance the local teachers' and students' awareness of improving the Chinese character learning efficiency to some extent.

In addition, the research methods in this study may provide some reference significance for the data collection methods in the present emergency online teaching and learning period (such as developing the online testing platform). Although the classroom teaching and data collection have been greatly influenced by the worldwide Covid-19 pandemic in recent three years, we developed an online Chinese character reading test platform to collect the instant voice recording and word translation data in the online classroom. Also, such methods and results could be of some reference value to the studies regarding the CHL and non-CHL learners in other countries and regions. Overall, the significance of this study is all about filling in the research gaps not only in the theoretical framework but also in Chinese character

teaching and learning overseas, by contributing some knowledge to the academia of teaching Chinese as a heritage/foreign language and suggesting implications to L2 Chinese learners and Chinese instructors.

1.4 Overview of the rationale

Many factors mutually decide the L2 achievement of learning Chinese characters, such as the learners' home background, previous language learning experiences, learning strategies, teaching methods, etc. (Sung & Wu, 2011). In this study, the primary focus is to compare the CHL and non-CHL learners in learning to read Chinese characters. Therefore, the main differences between the two groups of learners are taken into consideration, such as their home backgrounds, Chinese learning motivation, and learning environment. In general terms, the theoretical framework of this study is enlightened by Spolsky's general model of second language learning, comprising of Chinese character knowledge and reading model, L2 Motivational Self System, and the formal and informal Chinese learning contexts of the CHL and non-CHL learners. The subsequent paragraphs will give a brief overview of each component.

Firstly, Spolsky's general model of second language learning highlights the crucial roles of the learners and situations interplayed in linguistic achievement. In short, the social context influences the learners' attitudes and motivation to learn the target language. These, together with other personal elements, make the learners use formal or informal learning opportunities accordingly. Finally, the interaction of the individual diversity and the social context would

affect the “linguistic and nonlinguistic outcomes” (Spolsky, 1988, pp. 384-387). Therefore, under this theory, I propose a simple model on the development of Chinese character reading achievement by the CHL and non-CHL learners and the potential factors in this study. In other words, the different socio-cultural and family contexts of the CHL and non-CHL learners may influence their Chinese learning motivation and how they make use of the formal and informal learning opportunities, which then ultimately might lead to different learning outcomes.

Secondly, in terms of reading Chinese characters, one’s ability to recognize a Chinese character refers to knowing its orthographic form, meaning and pronunciation. Reading Chinese characters involves three dimensions: orthography, phonology and meaning. The tricky problem is that one may not pick up the phonological information directly from the Chinese character’s orthography. Very different from the alphabetic languages which are written based on their pronunciation, Chinese characters are more closely to the meaning they represent. Historically, Chinese character reading was viewed as orthography-meaning mappings (Perfetti et al., 2005). However, this concept was supplanted by later research which compared English and Chinese word reading and proposed the Universal Phonological Principle (UPP) (Perfetti et al., 1992; Tan & Perfetti, 1998). In brief, Chinese character reading does involve the activation of phonology, even reading for meaning. Perfetti and his colleagues conducted a series of empirical studies on Chinese characters’ meaning and pronunciation judgment tasks and found solid evidence that reading for Chinese characters’ meaning would automatically activate the pronunciation of the whole character (Liu et al., 2003; Perfetti & Zhang, 1995; Spinks et al., 2000; Zhang et al., 1999). In addition, the Lexical Constituency Model highlights the interrelationships among the orthography, phonology, and semantics (Perfetti & Liu, 2006). These three constituents are mutually

activated in the process of recognizing a Chinese character. Moreover, they added radicals into the Lexical Constituency Model to demonstrate that radicals are important orthographic units in Chinese characters. But this model failed to incorporate those unreliable phonetic and semantic radicals. Because of these indispensable elements in reading Chinese characters, a great number of studies have conducted different experiments to instantiate their effects on Chinese character acquisition.

Thirdly, as one critical individual factor, motivation plays a significant role in L2 Chinese learning. Some scholars indicate that L2 Chinese learners' better development of Chinese character knowledge might associate with their higher learning motivations and positive attitudes (Chen, 2019; J. Zhang, 2016), but no more quantitative or qualitative evidence so far can be reached in the study of Chinese character learning by CHL and non-CHL learners. To this end, this study intends to integrate the motivational factors of L2 language learning into the theoretical framework to investigate the relationship between the CHL and non-CHL learners' motivation in learning Chinese and their Chinese character recognition achievement.

Early theories on L2 motivation underscore the "integrative" and "instrumental" orientations, with the former referring to L2 learners' interest in successfully integrating into the cultural community of the target language, and the latter referring to the pragmatic and utilitarian benefits from learning that language (Gardner & Lambert, 1972; Gardner, 1985). This theoretical framework was later extended by Dörnyei and his colleagues. They supplemented more motivational elements, such as the learners' attitudes, vitality of the L2 community, milieu, self-confidence, and cultural interest (Csizér and Dörnyei, 2005). Recent decades, a new orientation in this field turns to focus on L2 learners' Motivational Self System, in which the ideal L2 self, ought-to L2 self, and L2 learning experience are three chief components to

explain the motivation of learning a foreign/second language. The ideal L2 self refers to L2 learners' desire to become a target-like speaker; the ought-to L2 self refers to L2 learners' attributes to meet the expectations from their social environment; and the L2 learning experience refers to L2 learners' positive engagement in their L2 learning process, including the class environment, teaching methods, the influence of language teachers and partners, etc. (Dörnyei and Ushioda, 2009; 2011). In short, these L2 motivational models remind us of the important relationship between L2 development and the learners' subjective initiative in their social contexts.

Fourthly, the frequency of exposure to the target language is another component that might affect L2 Chinese character reading achievement in my conceptual framework. According to the input hypothesis (Krashen, 1985), comprehensible input and output theories (Swain, 1985), and the input-related factors in language learning (Ellis, 2002, 2006; Schmitz, 2010), the formal and informal learning opportunities of L2 learners should be attached to great importance. Under the formal and informal learning contexts, the learners may have a variable frequency of exposure to language input and intake. Likewise, the frequency of the language input appearing in the learners' study environment might also affect their learning outcomes. Schmitz (2010) opined that frequency contributes to language learning as one significant input-related factor. The frequency effects are found in various linguistic knowledge processing (Ellis, 2002). Furthermore, with respect to L2 vocabulary acquisition, incidental learning could also have some contributions. The learners may acquire the vocabulary knowledge unintentionally when they read or hear the target language in daily life (Nation, 2013; Paribakht & Wesche, 1999; Shu et al., 1995). In this regard, it is hypothesized that the CHL and non-CHL learners might experience the incidental learning process when they engage in some after-class Chinese activities, so I am going to examine whether their

frequency of exposure to Chinese could affect the achievement of learning to read Chinese characters.

In addition, considerable previous studies suggest that there exist differences in Chinese language learning environment between the CHL and non-CHL learners. Based on the general model of second language learning, I incorporate the curricular and extracurricular Chinese learning contexts of the CHL and non-CHL learners into my conceptual framework. In this study, the curricular Chinese learning context refers to the Chinese character instruction in class and textbooks (formal learning opportunities), while the extracurricular Chinese learning context refers to the learners' frequency of attending after-class Chinese activities (informal learning opportunities). For the formal learning context, I intend to explore the CHL and non-CHL learners' views on class and textbook instruction and whether their perspectives are related to the Chinese character reading achievement. For the informal learning context, I intend to investigate the relationship between the learners' Chinese character reading achievement and their frequency of extracurricular Chinese activity engagement.

1.5 Definition of key terms

This section gives a brief introduction of the definition and scope of each key term in this study to avoid confusion. More details can be seen in Chapter 2.

CHL learners: CHL learners are those who grow up in a non-Chinese speaking country but

can speak or at least understand some Chinese, as their heritage language, at home and in the community, and they have more or less ethnolinguistic connections to Chinese cultural heritage but embrace a wide range of imbalanced Chinese linguistic skills in different domains (He, 2006, 2018; He & Xiao, 2008). In this study, the CHL learners' ethnic group is Hoa (Chinese origin) in Vietnam.

Non-CHL learners: Non-CHL learners are those who have no affiliations to the Chinese language and culture in their household but learn Chinese as a foreign or second language under formal instruction. In this study, most non-CHL learners' ethnic group is Kinh and one Khmer student in Vietnam.

Chinese character reading: It refers to the learners' ability to output accurate pronunciation and meaning when looking at the print Chinese characters. In this study, a successful Chinese character reading requires the learners to produce understandable pronunciation and the correspondent Vietnamese meaning of the given Chinese characters.

L2 Chinese learning motivation: It refers to an internal drive for a person to exert efforts to achieve some goals in learning Chinese Mandarin as a second/foreign language. Based on L2 Motivational Self System (Dörnyei, 2005; Dörnyei and Ushioda, 2009) and the nature of CFL and CHL learners, this study accepts Lin's (2018) motivational framework comprising of the ideal L2 self, ought-to L2 self, L2 learning experience, family influence, intended learning effort, instrumentality in promotion, and instrumentality in China and Mandarin (pp. 83-86).

Frequency of extracurricular Chinese activity engagement: Frequency refers to the times that the target language items appear in L2 learners' input. In this study, the learners'

frequency of engaging in extracurricular Chinese activities refers to how often they speak Chinese with family or friends, watch Chinese TV programs, listen to Chinese songs, visit the Chinatown or Chinese market, read Chinese books, and write Chinese characters after class.

Views on Chinese character instruction: The views on Chinese character instruction are the students' perceptions of their Chinese character learning formal context, namely how the Chinese characters are taught in class and textbooks. It reflects the L2 learning experience in the L2MSS model.

1.6 Thesis organization

There are five chapters in the thesis:

Chapter 1 is the introduction of this study. It introduces the study backgrounds, including the theoretical and empirical basis and my personal research interests. Following that, it states the research problems and raises three research questions. It then introduces the study objectives and significance, the overview of the theoretical framework and research design, the definition of key terms, and the thesis structure.

Chapter 2 is the review of literature in terms of the relevant theories and empirical studies on learning Chinese characters, CHL and non-CHL learners, L2 Chinese learning motivation and frequency and language learning achievement, which then directs to the conceptual framework, research gap and questions.

Chapter 3 describes the mixed research methods and the pilot study in detail. It introduces the information about the participants and setting and the research ethics. The research instruments are online mode consisting of the Chinese character reading test, a Chinese learning questionnaire, and open-ended questions probing the students' views on Chinese character instruction. Also, this chapter elaborates on the data collection procedures, the ways for data coding and analysis, and the reliability and validity.

Chapter 4 demonstrates the research results and findings. To answer the RQs 1&2, it provides the statistics description and analysis of the Chinese character reading test, L2 Chinese learning motivation and the frequency of extracurricular Chinese activity engagement, and the relationships among them. To answer the RQ 3, this chapter presents the core findings from the students' answers to the open-ended questions, with the themes and supporting examples.

Chapter 5 is the final part that discusses the development of Chinese character recognition among the CHL and non-CHL learners in Vietnam, the relationships between L2 motivation, frequency, and Chinese character reading achievement, individuals' perceptions of Chinese character instruction, and the implications for overseas Chinese character teaching and textbook development. This chapter concludes with a summary of the study background, research questions, methods, main findings, significance, and a discussion of the study limitations and suggestions for future research.

Chapter 2: Literature Review

2.1 Chapter introduction

This chapter will introduce the main theories and some previous studies in relation to this study and then lead to the research gap and questions. Based on my conceptual framework of the present study, it is organized in five sections: Chapter introduction, reading Chinese characters, CHL and non-CHL learners, L2 Chinese learning motivation and the exposure frequency, Chapter summary and research gap.

As introduced in Chapter 1, the theoretical framework of this study is enlightened by Spolsky's general model of second language learning that features the interactions of the learners and their learning environment played in language achievement. In brief, he indicates that the social context (including family, community, and the state language policies) could influence the learners' attitudes and motivation to learn the target language. And L2 motivation with the individual traits, together make the learners use the formal or informal learning opportunities accordingly. Finally, the interplay of the individual diversity and their social context would affect the "linguistic and nonlinguistic outcomes" (Spolsky, 1988, pp. 384-387). Illuminating by his model, I propose a simple framework for the development of Chinese character reading achievement by the CHL and non-CHL learners in this study. To be specific, the different sociocultural and family contexts of the CHL and non-CHL learners may influence their Chinese learning motivation and how they make use of formal and informal opportunities to learn Chinese characters, which then might lead to different learning achievement ultimately. In this study, the formal learning opportunity refers to the

Chinese character instruction in class and textbooks, while the informal learning opportunity refers to the learners' frequency of exposure to Chinese after class, or attending extracurricular Chinese activities. The main contents in each section are briefly articulated as follows.

The reading Chinese characters section (2.2) discusses three dimensions: Chinese characters, Chinese character reading theory and empirical studies, Chinese character instruction in class and textbooks. In the CHL and non-CHL section (2.3), I elaborate on three aspects: the definition of CHL and non-CHL learners (including an overview of CHL learners in Vietnam), comparing CHL and non-CHL learners, and learning Chinese characters by CHL and non-CHL learners. The L2 Chinese learning motivation and frequency section (2.4) discusses the diverse individual contexts in L2 language development, particularly in three parts: L2 learning motivation; motivation, frequency, and second language learning achievement; Chinese learning motivation and frequency of CHL and non-CHL learners.

2.2 Reading Chinese characters

2.2.1 Chinese characters

This sub-section will illustrate the nature and features of Chinese characters, as well as the relationship between Chinese characters and words. Only if we have a clear knowledge of Chinese characters can we better promote teaching and learning. First and foremost, it is

important to distinguish the nature of Chinese character as a symbol recording the speech and the nature of its representations (Qiu, 2013, p. 10). In general, a Chinese character has a pronunciation and meaning at the language level, but it also has a complex structure and formation which is different from the alphabetic scripts. The pronunciation and meaning of a Chinese character are actually the pronunciation and meaning of the word represented by that character, while the character pattern is the written form (Qiu, 2013, p. 109).

Chinese character is a written symbol for recording the Chinese language. The nature of it is morphemic-syllabic writing (Qiu, 2013, p. 18), or morphosyllabic writing system (DeFrancis, 1989). For example, "家" this character is used to record the pronunciation /jiā/ with the meaning [family]. Here, /jiā/ is a one-syllable word, and it is also one morpheme. Moreover, the disyllabic morpheme "葡萄[grape]" has two characters "葡/pú/" and "萄/tao/". The relationship between Chinese characters and morphemes is complicated. In short, there are five situations: (1) one character is a monosyllabic morpheme, such as "小/xiǎo/ [small]"; (2) one character is a monosyllabic non-morpheme, such as "忐/tǎn/" (but "忐忑/tǎn tè/ [uneasy]" is a morpheme); (3) one character is a monosyllabic polymorphemic word, such as "清/qīng/ [clear, quiet, distinct, completely]"; (4) one character is a polysyllabic polymorphemic word, such as "还/hái/ [yet], 还/huán/ [return]"; (5) the variants of a character, such as "峰/峯/fēng/ [peak]" (but this situation is uncommon in modern Chinese).

Furthermore, the simplified and traditional Chinese characters are concurrently used in China nowadays, with the former in mainland China and the latter one in Hong Kong, Macao, and Taiwan. Since the simplified Chinese characters are taught in international Chinese language courses, the traditional characters are out of the scope in this study.

On the other hand, as the basic unit of the logographic writing system, Chinese character is of two-dimensional structure, comprising of *strokes* and *components*. Each Chinese character can accommodate in a square. Strokes (i.e., lines and dots) are the first level when writing Chinese characters. A stroke is completed by the pen touching the paper and then raised. There are eight basic stroke types: dot (丶), horizontal line (一), vertical line (丨), left-falling stroke (丿), right-falling stroke (乀), hook stroke (亅), lifting stroke (㇀), and turning stroke (乛). Strokes make up components, and the components constitute the characters. Some components are the independent characters (e.g., 女, 木, etc.) while some components are non-character forms (e.g., 氵, 扌, etc.). In view of the configuration, Chinese characters can be divided into single/independent characters and compound/combined characters. The single characters are the basis of many compound characters, but they only account for a very small percentage. Over 90% of Chinese characters are combined forms (Han, 2009, p. 82). Different from the alphabetic scripts with letters placed transversely and linearly, there are three main structures of the compound characters: left-right, top-bottom, and (half)surrounded (e.g., 桥/爸/园). This feature makes a character well-fitted in a squared box. Furthermore, the combination rules of the components forming Chinese characters are also worth attention. Although some components can appear anywhere in a character (e.g., "口" in "吃[eat]", "和[and]", "呆[dull]", "杏[apricot]", "国[nation]"), some components have their exclusive positions (e.g., "氵" appears on the left side; "宀" appears on the top). The major structural types of modern Chinese characters are seen in Table 1 below.

Table 1 Fundamental structures of Chinese characters

Structure	Examples
Single-component characters	一、五、八、雨、我、大、不、山、今、水 etc.
Compound characters	
left-right	你、好、他、姐、阳、师、红、狗、读、请 etc.
left-middle-right	做、游、湖、粥、瓣、潮、懒、晰、树、渺 etc.
top-bottom	花、爸、笑、早、笔、朵、要、歪、草、架 etc.
top-middle-bottom	高、鼻、慧、常、喜、宴、曼、惹、葱、禀 etc.
half-surrounded	问、向、风、运、虎、医、右、房、这、病 etc.
surrounded	园、圆、国、围、回、团、图、因、困、固 etc.

Note. Other structural type like: 品、森、晶、众、磊、犇 etc.

Another important concept within Chinese characters is the *radicals* which refers to the functional constituents in compound characters cueing the meaning or pronunciation of that character (Anderson et al., 2013; Shen & Ke, 2007), such as the semantic radical "扌(hand)" in "打(hit)" "摆(put, wave)" "抄(copy)", etc. The semantic radicals can be seen as the head of a group of Chinese characters which share the same ideographic components. It should be noted herein that the radicals in Chinese characters are not equal to the components. In short, "Radicals are components, but not all components are radicals" (Han, 2009, p. 81). The major components can be further divided into subcomponents which have their own independent meaning or pronunciation but lose their semantic and phonetic functions within the compound characters (Shen & Ke, 2007). For example, one major component "安" in "按" consists of two subcomponents "宀" and "女". In other words, the phonetic components of the phonogram characters are not radicals as they only represent the pronunciation.

In addition, it is crucial to know the formation methods of Chinese characters, as it will help us better understand the structure and nature of Chinese characters. A well-known saying goes to Xu Shen (Eastern Han Dynasty)'s "Six Category Theory". Based on this formulation, Chinese characters can be categorized into pictographs, indicative characters (self-explanatory characters), associative compounds, phonograms (semantic-phonetic compounds), mutually explanatory characters, and phonetic loan characters.

The pictographic characters represent things visually (e.g., 山/shān/ [mountain]), and the indicative characters use the symbolic signs to imply the meaning (e.g., 上/shàng/ [up], 下/xià/ [down]). The pictographic and indicative characters constitute a small proportion in modern Chinese character family, and they are of independent structure that cannot be divided into more components. The associative compounds are created by two or more ideographic characters. They combine together to form new characters with new relevant meanings (e.g., 明/míng/ [bright] is composed of 日[sun] and 月[moon]). The phonogram or semantic-phonetic compound characters are very common (more than 80%) in modern Chinese (Zhou, 1978) or even estimated at over 90% to date (Xing, 2015, p. 301). They are composed of a semantic radical directing the meaning and a phonetic constituent indicating the pronunciation information (e.g., 晴/qíng/ [sunny] consists of the semantic radical 日[sun] and the phonetic component 青/qīng/).

However, in effect, the mutually explanatory characters and phonetic loan characters are two ways of using characters, but not the formation methods. The mutually explanatory characters are a group of characters with the same components, same meanings, and similar pronunciations. Ancient Chinese people explained one character by referencing to another

(e.g., “考” & “老”). This category is controversial among scholars, and actually, there is no need to distinguish them in modern Chinese (Qiu, 2013, p.107; Tang, 2005, p. 58). The phonetic loan characters are borrowed characters to represent a new meaning. To be specific, the ancient Chinese used the existing characters (borrowing the sound) to record the words that did not have written forms. For example, the shape and pronunciation of “花”(/huā/ [flower]) are borrowed to express another meaning “spend”, so the “花”(/huā/ [spend]) becomes a phonetic loan character. Also, there are many phonetic loan characters having different shapes but the same pronunciation as their original characters. Because of lacking sufficient characters, there were a great number of phonetic loan characters in the Shang and Zhou Dynasties (17th-256 BC) (Han, 2009, p. 75). These two types of characters are analyzed from the etymology lens but do not directly relate to character structure (Myers, 2019, p. 8). The mutually explanatory characters and phonetic loan characters are mainly discussed in ancient Chinese texts and are regarded as two ways of using characters. At the same time, the pictograph, indication, associative compounds, and semantic-phonetic compounds are nowadays recognized as four formation methods of Chinese characters (Xing, 2015, p. 298). Therefore, this study will focus on the pictographs, indicative characters (self-explanatory characters), associative compounds, and phonograms (semantic-phonetic compounds) when investigating L2 Chinese character reading achievement.

Besides what have been covered above, the last but essential point is the relationship between Chinese characters and words. It is universally acknowledged by many linguists that characters and words belong to two different domains, with the former in the writing system whereas the latter in the language system. However, the situation becomes complex in research of ideographic writings as the written forms directly or indirectly reflect human’s thoughts (Saussure, 2006, 2011). Chinese character is the basic structural unit of the Chinese

language (Xu, 2001, p.373). As mentioned previously, Chinese characters are morphemic-syllabic scripts, and we have learned the intricate relationship between Chinese characters and morphemes. They are the graphical representations of spoken morphemes (Myers, 2019, p. 3). In general terms, Chinese characters can document single words, morphemes, and meaningless phonetic symbols. Furthermore, with the long-term development of the Chinese language, disyllabic words account for a dominant position in modern Chinese. In other words, there are a great number of two-character words appearing in Chinese people's daily utterances. It is reflected in modern Chinese instruction textbooks. The Chinese characters bear a close relationship to the words. Chinese characters play a vital role in distinguishing the homophones, and the learning of words supports the learning of Chinese characters (Wan, 2018).

Chinese characters are the basic unit of word formation. For those characters with independent meaning, one character is a word (e.g., 水/shuǐ/ [water], 笑/xiào/ [laugh], etc.). Meanwhile, these characters can also form disyllabic words by combining them with other characters (e.g., 喝水/hē shuǐ/ [drink water], 微笑/wēi xiào/ [smile], etc.). On the other hand, for those characters that cannot be used independently in a sentence, we usually add another character to form a word (e.g., "蝴" cannot appear alone in a sentence, and we must add "蝶" to generate the word 蝴蝶/hú dié/ [butterfly]). Overall, learning Chinese characters is essential in learning to read Chinese.

2.2.2 Chinese character reading theory and empirical studies

It is widely recognized that all written words are used to record the human spoken language. A universal principle would be that reading involves the readers understating the written language at phonological and morphemic levels (Perfetti, 2003). In terms of the definition of reading Chinese characters, one's ability to recognize a Chinese character refers to knowing its orthographic form, meaning and pronunciation. It refers to the learners' ability to retrieve accurate pronunciation and meaning when looking at Chinese characters. However, because of the phonetic opacity, learners may not pick up the pronunciation directly from the Chinese character's orthography.

Very different from the alphabetic languages that are written based on their pronunciation, Chinese characters are more closely to the meaning it represents. With the evolution of Chinese character forms, although hitherto only a tiny proportion of today's simplified characters can be directly interpreted from the pictographic shapes, every Chinese character corresponds to a syllable. Another fact is that albeit there are more than 80% of semantic-phonetic compound characters in modern Chinese, many Chinese characters are of phonetic opacity as the phonetic components usually share different pronunciations with the whole characters. Moreover, the semantic radicals, which do not provide direct clues to the whole characters, generally imply the meaning at the category level; and even some radicals, same as those unreliable phonetic constituents, are not transparent either. These characteristics make reading Chinese characters a fascinating but challenging task in both L1 and L2 learning.

Reading Chinese characters involves three dimensions: orthography, phonology, and meaning. In history, Chinese character reading was viewed as orthography-meaning mappings (Perfetti et al., 2005). As the study progressed, this concept was questioned by later

research which compared English and Chinese word reading and proposed the Universal Phonological Principle (UPP) (Perfetti et al., 1992; Tan & Perfetti, 1998). In other words, more and more scholars underscore that reading Chinese characters does involve the activation of phonology, even reading for meaning. Perfetti and his colleagues conducted a series of empirical studies on Chinese character's meaning and pronunciation judgment tasks and found solid evidence that reading for Chinese characters' meaning automatically activates the pronunciation of the whole character (Liu et al., 2003; Perfetti et al., 2002; Perfetti & Zhang, 1995; Spinks et al., 2000; Zhang et al., 1999). Additionally, the great bulk of homophonic but heterographic characters in Chinese makes the identification a bit more complex (e.g., "家[family]", "佳[good]", "加[add]" share the same pronunciation /jiā/) due to that the syllable-morpheme correspondence has various possibilities. In this regard, we should also attach great importance to the role of Chinese orthographic knowledge played in reading and writing Chinese characters (Leong et al., 2011).

In a similar vein, the Lexical Constituency Model highlights the interrelationships among the orthography, phonology, and semantics (Perfetti & Liu, 2006). These three constituents are mutually activated in the process of recognizing a word. Moreover, they added radicals into the Lexical Constituency Model to demonstrate that radicals are important orthographic units in Chinese characters. But this model failed to incorporate those unreliable phonetic and semantic radicals. Because of these indispensable elements in reading Chinese characters, considerable studies have conducted various experiments to instantiate their roles in Chinese character acquisition. Readers should be equipped with knowledge about Chinese orthography and configuration when decoding Chinese characters.

First and foremost, it is crucial to learn the Chinese character orthographic knowledge. The

orthographic knowledge refers to the learners' "understanding of the conventions used in the writing system of their language" (Treiman & Cassar, 1997, p. 70). In Chinese, it refers to the learners' "understanding of orthographic conventions and rules for Chinese characters" (Wong, 2020a, p. 681), namely the learners' knowledge of the Chinese characters' internal structure rules and the ability to use such rules for decoding characters. Specifically, Chinese orthographic knowledge includes learners' ability to perceive the real components of Chinese characters, to identify the structure of arranging the components, and to understand the positional constraints of the components in Chinese characters (Hao, 2007; Loh et al., 2018; Qian et al., 2015; Zhang, 2016).

Secondly, semantic radical knowledge can help learners distinguish between reading Chinese and other alphabetic orthographies (McBride, 2016). Semantic radicals convey the relevant meaning in compound characters, for example, "山[mountain]" as the semantic radical in characters "峭[high and steep]", "峡[gorge]" and "岭[ridge]", it appears on the left side and shares the meaning pertinent to the whole character. Another common instance is "氵(related to water)" in many compound characters: "江[river]", "溪[stream]", "湖[lake]", "海[sea]", "洗[wash]", "清[clear]", "游[swim]", etc. Nevertheless, not all Chinese characters have the transparent meaning represented by the semantic radicals (e.g., "淑 [kind and gentle]"). Semantic radical awareness refers to learners' ability to identify the semantic radical within the compound characters and apply the semantic radical knowledge to infer the related meaning of the compound characters (Shen & Ke, 2007). The learners' Chinese character learning efficiency will still be highly improved if they can understand the positional and functional regularity of semantic radicals in most compound characters.

The third necessary knowledge lies in understanding the unreliability of phonetic components in Chinese characters. The phonetic radical awareness refers to that learners can understand the functional and positional regularity of Chinese phonetic components in compound characters (Shu et al., 2000). For example, "成/chéng/" as the phonetic component in characters "城/chéng/" and "诚/chéng/", it appears on the right side and shares the same pronunciation as the whole character. Another instance "马/mǎ/" in compound characters "妈/mā/", "码/mǎ/" and "骂/mà/", they share the same initials and finals except for the different tones. Although the phonetic components can provide some phonological clues for learning the pronunciation of some characters, Chinese characters are notorious for its phonetic opacity (such as "去/qù/" in "法/fǎ/" and "怯/qiè/"). In general, this rule may mislead the learners to deduce the wrong pronunciation of a new Chinese character that they have not learned.

The fourth pivot is the importance of morphological awareness in reading Chinese words. We have discussed the close relationship between Chinese characters and words in the previous section. Since many characters are repeatedly used in many words, such as "家" in 家庭[family]/家人[family members]/家乡[hometown]/国家[country]", learning such Chinese characters in words would be a very effective way. Moreover, there are a great number of homophones and homographs in Chinese; thus, it is essential to distinguish the characters in different word contexts. Considerable studies on Chinese character acquisition by L1 children have demonstrated the unique role of morphological awareness in reading Chinese (e.g., McBride-Chang et al., 2003). There is a strong relationship between morphological awareness and reading in Chinese, particularly for younger Chinese children (Kuo & Anderson, 2006). Also, an increasing number of studies have found similar results among

CSL/CFL learners in recent years (Zhou, 2021).

Overall, learning to read Chinese characters involves the above processing knowledge. Previous studies conducted a variety of tests related to reading Chinese characters. For example, many scholars used the Chinese character reading/recognition task to examine the learners' character identification capacity, in which the participants are usually asked to read aloud the presented Chinese characters one by one until they cannot read a number of consecutive items or spend over time (e.g., Hao, 2018; Ho & Bryant, 1997; Li, et al., 2012; etc.). Hao (2007) conducted the Chinese character decision test having the participants judge whether the presented character is accepted or not. Likewise, Jiang et al. (2020) conducted the Chinese disyllabic word decision test in which the participants needed to judge the word or nonword. Additionally, in many studies, there are various tests to investigate the learners' Chinese orthographic knowledge, phonological and morphological awareness (Yang et al., 2022), phonetic radical awareness (Zhang & Roberts, 2019) and semantic radical awareness (Chen, 2019; Shen & Ke, 2007). To my current knowledge, there is no standardized test to examine L2 Chinese character reading.

2.2.3 Chinese character instruction in L2 class and textbooks

This sub-section will review the literature from a practical use perspective, with an introduction of L2 Chinese character instruction, the learners' reviews on class instruction and textbooks, as well as the status quo of Chinese teaching and textbooks in Vietnam.

Teaching Chinese characters has long been seen as a challenging task in teaching Chinese as

a second/foreign/heritage language. Although most overseas Chinese courses attach great importance to Chinese listening and speaking skills, Chinese characters cannot be removed from the class and textbooks, at least recognizing the common characters and words. Unlike Chinese native speakers, CSL/CFL learners do not have a large oral vocabulary before learning Chinese characters. They are rarely exposed to Chinese characters in daily life and have less time to learn them (Cheung, 2008). In this sense, Chinese character instruction is especially important in L2 classes.

In general, reading Chinese characters is the major goal of CSL/CFL learners instead of writing characters as L2 learners seldom need to write characters by hand after class (Cheung, 2008). A majority of instructors teach Chinese characters in topic words in each lesson and then introduce how to write that character stroke by stroke. Usually, they do not have enough time to explain the structures and combination rules or the sub-character knowledge in class, instead asking students to practice writing after class. Writing Chinese characters does help recognition, many students however find it very difficult and time-consuming to do such homework.

Considerable studies have discussed the effective pedagogies to teach Chinese characters in L2 classes. In an early study comparing the implicit and explicit learning of Chinese characters, Wang et al. (2004) demonstrated that the explicit instruction significantly facilitated adult CFL learners' understanding of the meaning of low-frequency semantic radicals, while the learners' implicit knowledge was helpful in extracting the meaning cues from high-frequency semantic radicals. He (2018) investigated the effects of the explicit instruction of Chinese semantic radicals on CFL learners' reading comprehension by conducting a pretest-intervention-posttest session and an open-ended questionnaire. The

mixed data revealed that the CFL learners found it very helpful of the semantic radical explicit instruction to their posttest of Chinese text translation and showed more intended motivation in learning semantic radicals. Lai et al. (2020) conducted a three-week quasi-experiment study to compare the effectiveness of two Chinese character teaching approaches, finding that the inductive instruction under the teacher's guidance could more greatly facilitate the CFL learners' knowledge of semantic radicals used in recognizing Chinese characters than deductive instruction. In other words, CFL learners would grasp better knowledge in processing Chinese characters more effectively when the teacher guides them to find out the radical-character relationships among the example characters and then summarize the rules to help students identify other new characters that contain the radicals. However, the status quo of L2 Chinese character teaching has not been improved fundamentally. Many teachers pursue the number of Chinese characters that have been taught but often fail to help students grasp the characteristics of the Chinese writing system, leading their understanding of Chinese characters to seem as loose as a plate of sand (Wan, 2019).

The previous studies have told us that explicit instruction or guided inductive instruction could effectively foster CFL learners' Chinese character learning and were acknowledged as helpful teaching approaches in their views. Nevertheless, most quantitative research only investigated the unique role of semantic radicals in learning Chinese characters, especially in inferring the meanings of the unknown characters. Few studies have explored the CSL/CFL learners' direct perspectives of the class instruction on Chinese characters. As this study focuses on L2 Chinese character learning in Vietnam, the following paragraphs will give a general review on some related studies.

Chinese language teaching has a long history in Vietnam. Culturally and historically, Vietnam

is one of the countries in the Chinese cultural circle. Still, Vietnamese locals feel much difficulty in learning Chinese characters because they use the alphabetic writing system. Vietnamese ("Quốc Ngữ") belongs to the Viet-Muong Group, the Austroasiatic language family, and uses Latinized phonetic characters (W. Luo, 2018, p. 2). On the other hand, the teachers and students paid more attention to Chinese listening and speaking skills rather than Chinese character learning (Guan, 2011; Zhou, 2019). In the field visits, Zhou (2019) found that the Vietnamese students at universities and language training institutes have less access to a large number of Chinese characters, and they usually develop listening and speaking skills first, followed by reading and writing. Furthermore, Chinese character instruction is mixed with vocabulary and conversation learning in most schools. Many local teachers only spend a short time introducing some characters appearing in the conversation in textbooks but ignore illustrating the features of Chinese characters, such as the combination rules of the components (Li, 2011; Wang & Zhu, 2011).

In terms of teaching materials, there is a scarcity of appropriate textbooks and workbooks for the local students to learn Chinese characters. With a growing number of Chinese language learners in Vietnam, the textbooks and workbooks have failed to meet the high quality and suitability of the learners' demand. Most institutions are adopting textbooks written in mainland China, Hong Kong or Taiwan, and many local Chinese teaching materials are somewhat out-of-date (Chen, 2018). Albeit there exist some good teaching materials that are combined with the local Vietnamese culture, numerous textbooks are topic-oriented with less focus on systematic Chinese character instruction. Li (2019) analyzed one typical L2 Chinese textbook, Experiencing Chinese-Living (also used to teach college students in my pilot study), and investigated user satisfaction via surveys and interviews. The author found that Chinese character recognition appears in the authentic context and all in topic-related words,

but only 53.88% of students think this section is helpful to their Chinese character learning. Wang et al. (2017) conducted survey research to investigate the Chinese teaching situation at five universities in southern Vietnam, finding that the textbooks used in most colleges were outdated and of insufficient in quantity and quality. Most of the universities adopted the Chinese textbooks and reference books compiled in mainland China, supplemented with some local teachers' self-designed teaching materials.

Furthermore, it is also essential to know the learners' perspectives on the current Chinese character teaching and textbooks. As introduced in previous sections, considerable studies pertinent to Chinese character acquisition are inclined to conduct cognitivist research, which often ignores the "sociocultural contexts or meanings associated with language learning" (Duff et al., 2013, p. 21). Some qualitative research was conducted to explore the learners' experiences and perspectives in the process of learning Chinese as a foreign language. Through a multi-case study and narrative research, Duff et al. (2013) interviewed five adult English-speaking learners of Mandarin about their Chinese learning experiences, reporting that the learners' Chinese character learning preferences, investments and practices have changed over time. The authors recommend that further qualitative research should be conducted with heritage and non-heritage learners (p. 100). Duyuan (2009) administered questionnaires to investigate the views on Chinese character instruction and textbooks of Vietnamese college students, reporting that most learners perceived Chinese characters as pictures at the beginning but gradually realized its logographic writing system; although they understood that knowing the Chinese orthographic features can help with their character learning, they seldom received such knowledge either in class or in textbooks and usually used the copying method to rote memorize Chinese characters.

Based upon the extant studies on Vietnamese students, it seems that the current L2 Chinese character instruction and textbooks are waiting for improvement and renewal. The previous research focused more on the teaching methods and the analysis of textbook contents, but a majority of them seem to be too general to reap a deep understanding of Chinese character learning of Vietnamese students. Moreover, some studies on the learners' and teachers' perspectives of Chinese character instruction and textbooks are not thorough enough to obtain more information, either by questionnaires or interviews, in which the students' backgrounds are seldom considered. In other words, the views of CHL and non-CHL learners tend to be intermingled. Therefore, I expect to explore how their views on Chinese character learning in class and textbooks might influence the development of L2 Chinese character reading achievement.

2.3 CHL and non-CHL learners

2.3.1 Who are the CHL and non-CHL learners?

Since the 1970s, the term "heritage language (HL)" has been introduced to the linguists' view. It referred to the non-official and indigenous languages in Canada (Cummins & Danesi, 1990, p. 8). Later on, considerable studies on HL speakers were conducted in the United States, where the heritage languages referred to immigrant, aboriginal, or colonial languages (other than English) in relation to family and cultural heritage (Fishman, 2001, p. 81; Wiley, 2001, p. 29). Van Deusen-Scholl (2003) emphasized the "linguistic and ethnic criteria" and

"heritage attitudes and motivation" bearing on HL learners (pp. 222-223). Valdés (2001) proposed a more specific definition toward HL learners by clarifying three criteria - "raised in homes where a non-English language is spoken", "speak or merely understand the heritage language", and "to some degree bilingual in English and the heritage language" (p. 38). However, most of the well-known definitions and discussions about the heritage languages are under the American context. America is a country of immigrants and has its own language policies, thus the definition of the HL learners might be a little different in other contexts. In other words, I prefer to use the definition in the pedagogical and linguistic dimension instead of the political, racial, national or regional issues in this study. On the other hand, although HL speakers normally have more opportunities to be exposed in the home language environment, most of them cannot develop a full range of native-like linguistic competence in their adulthood (Benmamoun et al., 2013; He, 2018). They are in somewhere between the native speakers and the pure second/foreign language learners.

The research on Chinese as a heritage language education had a later start. The CHL learners had been integrated into the CSL/CFL groups for a long time. In other words, the CHL and non-CHL learners usually had Chinese as a second or foreign language classes together, or in the same group compared with the Chinese native speakers in early studies. With more and more Chinese immigrants around the world and the rapid development of international Chinese education, CHL learners' language development has attracted a wide range of attention among the scholars, overseas Chinese teachers, and CHL learners' family members. CHL learners did not attract much attention from scholars until the beginning of the 21st century (Li & Duff, 2018).

In defining CHL learners, it involves many complicated issues. In brief, based on the widely

recognized definitions of HL learners, the CHL learners are those who grow up in a non-Chinese speaking country but can speak or at least understand some Chinese, as their heritage language, at home and in the community, and they have more or less ethnolinguistic connections to Chinese cultural heritage but embrace a wide range of imbalanced Chinese linguistic skills in different domains. Their Chinese language abilities tend to experience attrition when they are immersed in the local language and culture and are incompletely exposed to and acquiring Chinese (He, 2006, 2018; He & Xiao, 2008). Furthermore, they are diverse individuals in many aspects, including family backgrounds, language use, cultural and social identities, etc. CHL learners are "existing along the spectrum between the prototype of non-CHLL and pure CHLL" (Liang, 2020, p. 12).

In addition, from a geographic and national perspective, the CHL learners' family members could come from different regions in China where people speak different dialects or minority languages, but Mandarin has been widely promoted for decades, which makes CHL learners' backgrounds more complicated. Except for the Chinese minority languages (e.g., Tibetan, Uygur) which adopt different written scripts other than Chinese characters, people from the different dialect regions can communicate in characters notwithstanding they may not understand each other phonologically. Although the (grand)parent(s) of overseas CHL learners come from different dialect regions in China, they have a common written form for recording the heritage language. After many years' research on overseas Chinese and ethnic Chinese, Guo (2015, 2017) suggests that the word "祖语/zú yǔ/ [ancestral language]" may better elucidate the features of Chinese heritage language, which is marginalized, distinct from the native and second language and needs to learn.

By contrast, the non-CHL learners are those who have no affiliations to the Chinese language

and culture in their household but learn Chinese as a foreign or second language under formal instruction. In other words, the non-CHL learners are CSL/CFL learners in the traditional sense, excluding ethnic Chinese. They only learn Chinese as a communication tool and do not have Chinese national and cultural identity (Guo, 2015). Foreigners with Chinese nationality are not within this scope. Moreover, the non-CHL learners typically have limited exposure to and use Chinese in daily life, which may affect their Chinese learning advancement and motivation. Herein, I must emphasize that the CHL and non-CHL learners in this study are overseas Chinese language learners in an environment of a mainstream language other than Chinese.

As this study focuses on the CHL and non-CHL learners in Vietnam, it is indispensable to review the past and current state of CHL learners (Hoa) there. There are 54 ethnic groups in Vietnam (Fan & Liu, 2014), and the population of Hoa people ranks among the top four (Tang, 2020, p. 1). In 2018, the total population of Vietnam averaged 94.67 million, of which 900,000 were overseas Chinese (Sun, 2020, p. 1). Most Chinese immigrants live in southern Vietnam, dating from the 1680s (Xu, 2011). Their children are born in Vietnam and grow up under the Vietnamese culture and education. Although the CHL learners have been integrated into the local mainstream culture and life, their parent(s) or grandparent(s) are from China (Nguyen, 2018). Modern Vietnamese is not difficult for CHL learners since there are amounts of Sino-Vietnamese words (Fan & Liu, 2014, p. 33). They speak Vietnamese in daily life, followed by their family Chinese dialect, but seldom speak Mandarin. Their Chinese literacy gradually develops through learning, and most of their grandparent(s) or parent(s) are good at Chinese characters (Yao, 2015). Having made a detailed background inquiry, Yao (2015) found that 58.91% of CHL students are third or above the Chinese generation, while only 3.88% are of the first or second generation. Based on the above introduction and discussion,

to make it less unclear, this study mainly focuses on the Vietnamese CHL learners who are the second or third generation of ethnic Chinese, at least they have one parent or grandparent from China, and they have some exposure to Chinese at home and in the community.

2.3.2 Comparing CHL and non-CHL learners

According to the definitions of CHL and non-CHL learners discussed above, we know that they are different in nature and have different sociocultural contexts, but there are also some commonalities in their Chinese language development and the social-psychological realm in learning Chinese. This part will discuss some main differences and commonalities between the CHL and non-CHL learners in three aspects.

First, in light of the characteristics of different types of Chinese education, there are some similarities and differences between the CHL teaching and CFL teaching. For CHL learners, Chinese could be their mother tongue or first language, especially those who receive Chinese input when they are born and grow up, whereas Chinese is not the mother tongue or first language of non-CHL learners. Furthermore, CHL learners usually have Chinese ethnic and cultural identify. Even though many younger generations may be totally non-Chinese users, they still may feel some cultural connections to their heritage language when starting to learn it. CHL learners typically have more interest in their family connections, Chinese history, culture, and society (Guo & Wang, 2018; Luo et al., 2017). Their identities are more complex than non-CHL learners, and the desire for connections to the heritage culture plays an important role in the Chinese heritage language development (He, 2006). In contrast, most non-CHL learners only learn Chinese as a communication tool. Table 2 is a summary

borrowed and adapted from Guo (2015, p. 477).

Table 2 International Chinese language education for CHL and non-CHL learners

International Chinese language education	CHL learners	Non-CHL learners
Mother tongue	+	−
First language	+ /–	−
Chinese ethnic and cultural identify	+	−
Communication tool	+	+

Note. "-" means not applicable. "+" means applicable.

Second, in terms of Chinese language use and development, the CHL learners are said to be different from non-CHL learners. They normally have better Chinese aural and oral skills than their non-CHL peers, and their knowledge of Chinese characters and vocabulary tend to expand rapidly during the Chinese learning period (Guo & Wang, 2018; Luo et al., 2019). According to the Critical Period Hypothesis (Lenneberg,1967; Long, 2005), although there exist debates in L2 acquisition, considerable studies suggest that the age effects contribute to different linguist domain development, particularly in phonetic and phonological ultimate attainment. The CHL learners raised in a Chinese-speaking home and who acquire some Chinese before puberty are more likely to develop a near-native proficiency, so they may outperform the non-CHL learners who study Chinese after puberty when the brain matures and becomes less plastic. In addition, the input quantity and quality also play different roles in Chinese language development of CHL and non-CHL learners. Generally, besides Chinese class instruction, CHL learners may have more informal input either at home or in the community, while non-CHL learners mainly obtain formal input in Chinese class. However, the reduced input could be one primary reason why many CHL learners' incomplete

acquisition of Chinese and imbalanced development in different linguistic domains (Polinsky & Scontras, 2020). In this sense, If CHL learners do not have the age advantage of early exposure to Chinese, they might have similar performance in Chinese learning achievement to non-CHL learners in front of vulnerable input (Chen, 2020).

Research in recent years has provided some evidence to support the above views. Chen (2020) investigated the acquisition of four Chinese phenomena from phonology, morpho-semantics to syntax knowledge among CHL and L2 Mandarin learners in the United States, finding that the CHL learners had a modest advantage in tone 3 sandhi, aspect marking, and some relative clauses than adult L2 Mandarin learners, but neither of them successfully acquired the long-distance reflexives in Chinese. Under the quantitative and qualitative analysis, Wen (2018) compared the CHL and CFL learners' pragmatic knowledge of "requests" in Chinese. The result of her study reveals that the CHL learners had better lexicon and grammar achievement than CFL students, but they both seldom use the modal verb "neng (can)" and euphemisms, conservative expressions when the request is difficult, and overuse interrogative sentences and polite language when the request is not too difficult. Compared with Chinese native speakers, there is a shortage of euphemistic and moderate expressions with strong pragmatic function in both CHL and CFL learners' request languages. Moreover, a previous study of Xiao (2006) found that the CHL learners had significant better performance in listening, speaking, and grammatical structures than non-CHL learners, but had no advantage in abundant lexicon, reading comprehension, and writing Chinese characters. These studies suggest that CHL learners and non-CHL learners perform differently in some linguistic domains, but also share some similarities.

Third, in the social-psychological realm, with respect to L2 motivation, anxiety, and identity,

the CHL and non-CHL learners also share some commonalities and differences. CHL learners are generally more motivated to learn about their ethnic identity and family roots, thus they may have more driving force to communicate with people in same ancestral backgrounds in Chinese (Luo et al., 2017). In addition, positive attitudes, L2 learning experiences, and instrumental motivation played significant roles in CHL and non-CHL leaners' intended efforts in continuous Chinese learning, but CHL learners were more likely to be influenced by socio-cultural factors. And within the CHL groups, there seemed to be no significant differences in many motivational factors among the learners of diverse home language backgrounds (Wen, 2011). In short, main differences were observed between the CHL and non-CHL learners regarding Chinese learning motivation in previous studies. Section 2.4 will review the comparisons of L2 Chinese learning motivation between CHL and non-CHL learners in more detail.

Another important psychological issue is learners' anxiety in learning a foreign language. Prior research found that CHL and non-CHL learners felt the most anxiety in different linguistic domains. According to Xiao and Wong (2014)'s survey investigation, CHL learners had the most anxiety in Chinese writing, while the non-CHL learners' most anxiety lied in speaking. In a larger-scale investigation, Luo (2015) found that most CHL learners were most anxious in reading and writing Chinese, and the anxiety in writing was higher than in reading. Moreover, the CHL learners with a Mandarin background had more confidence in listening and speaking than the CHL learners with other dialect backgrounds or who did not speak Chinese at home. To date, there is a few studies on comparisons between the CHL and non-CHL learners' anxiety experiences in learning Mandarin Chinese, and the extant research provided statistical evidence to support that the CHL learners with Chinese exposure at home usually feel less anxious than the learners without any Chinese exposure and writing in

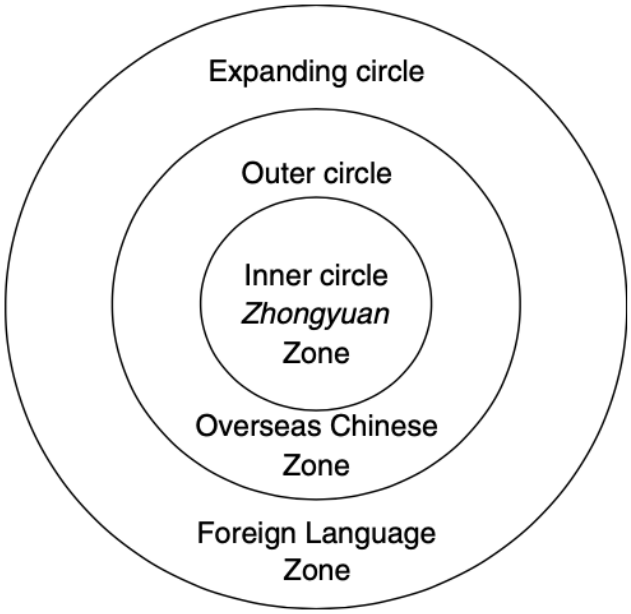
Chinese could cause the most anxiety than other sub-skills (H. Luo, 2018).

L2 learning motivation and anxiety are all related to L2 learners' identity. The complex identity issues influence L2 learners' motivation and anxiety in a foreign language classroom. In respect of L2 identity, there are also some differences between the CHL and non-CHL learners. Identity is an intricate and dynamic issue in L2 language development. Many scholars have advanced that Chinese language proficiency is a kind of symbol of CHL learners' ethnic identity in relation to their heritage maintenance (He, 2006, 2008; Polinsky & Kagan, 2007). By contrast, non-CHL learners have no demands to maintain such language heritage, and they learn Chinese mainly to get involved in communications with Chinese people or master one more language skill. CHL learners often feel contradictory in identities of being heritage learners and foreign language learners (Lee, 2005; Xiang, 2016). As most postsecondary CHL learners have Chinese classes together with non-heritage CFL learners, the instructors tend to have stereotypes and high expectations of CHL learners' Chinese proficiency, which often makes them under more pressure to avoid heritage identity sometimes. CHL learners' identity is more multifaceted since they might receive and produce Chinese dialects at home but are learning Mandarin at schools (He, 2006). Seeing that some Chinese dialects are very different from Mandarin phonetically and phonologically, these CHL learners may feel confused about their Chinese ethnic identity, especially when they obtain little literacy input at an early age. In this sense, the non-CHL learners seem to have no such troubles.

Overall, in a foreign language classroom, the CHL learners are a particular group, with a multifarious identity and imbalanced linguistic skills in Chinese language backgrounds, sharing differences and similarities in the nature of different types of international Chinese

education, Chinese language use and development, L2 motivation, anxiety, and identity with their non-CHL counterparts. Therefore, they should not be treated the same as traditional second or foreign language learners in Chinese classes. Goh and Lim (2010) proposed a paradigm of Three Concentric Circles of Mandarin users, in which CHL learners are in the Outer Circle, between the Inner Circle of Chinese native speakers and the Expanding Circle of non-CHL learners. This paradigm clearly presents the relationships and differences among various Chinese language learners. We borrowed their diagrammatic presentation (p. 18) in Figure 1 below for a more explicit demonstration.

Figure 1 "The three concentric circles of Mandarin users" in Goh and Lim (2010, p. 18)



2.3.3 Learning Chinese characters by CHL and non-CHL learners

In the previous section, we provide a general comparison between CHL and non-CHL learners, from linguistic to social psychological aspects. As this study focusing on Chinese

character reading development, it is important to review extant studies on Chinese character learning or acquisition by the two groups of learners. In the studies of anxiety in learning Chinese, we have learned that reading and writing could be the primary source of L2 learners' anxiety, whether they have a Chinese background or not. Also, in prior studies, many scholars proposed that HL learners generally were good at phonology, vocabulary, grammar, and culture knowledge of their heritage language, but were less proficiency in literacy skills (Campbell and Rosenthal, 2013; Carreira and Kagan, 2011). However, some recent studies have found different phenomena in these students' reading and writing development. In Section 2.2, we have known that there is a great number of studies on Chinese character acquisition by L1 children and L2 learners, but there is a very small number of research about CHL learners at present. Based on my current knowledge, this section will illustrate this issue in two parts.

The first part reviews the prior studies on CFL/CSL learners' Chinese character learning. Recent decades have seen a dramatic rise on Chinese character teaching and learning in a foreign language classroom. Some hot topics are: L2 learners' cognitive and psychological processing of Chinese character, the influence of L2 learners' L1 background and strategies on Chinese character learning, and Chinese character pedagogy exploration (Li, 2020; Zhang & Ke, 2018).

As introduced in Section 2.2, there are sub-knowledge within a Chinese character, such as the number and type of strokes, structure, phonetic and semantic radicals, which have been found to have some effects on Chinese character reading and writing. For example, Kuo et al. (2015) conducted a pseudo character acquisition task among 23 adolescent CSL learners, and the results showed that they acquired the characters with fewer number of strokes and

semantic radicals more quickly than the characters with more strokes and without radicals. The effect of the stroke number on Chinese character acquisition by L2 learners can also be seen in Sergent & Everson (1992) and Xiao (2002), etc. Moreover, considerable studies paid attention to semantic and phonetic radical awareness development of CFL/CSL learners. The general findings suggest that the semantic and phonetic radicals play vital roles in Chinese character processing, although their reliability is partial, L2 Chinese learners are more likely to rely on such information to recognize Chinese characters. Some previous studies revealed that phonetic radicals are important in CFL learners' Chinese character acquisition (e.g., Jiang, 2001; Tong & Yip, 2015), while Zhang and Roberts (2019) found that phonetic radical awareness was not the factor but phonological awareness that predicted their character reading and writing performance. Considerable studies have illustrated the significant role of semantic radical awareness in L2 Chinese literacy development (e.g., Jiang, 2008, pp.33-52; Shen & Ke, 2007; Tong & Yip, 2015; Vu, 2019). Nguyen et al. (2017) found that Vietnamese CFL learners made significant progress in transferring the semantic radical knowledge they have learned to analyze the unfamiliar characters in sentences. In the study of Vu (2019), he investigated the development of semantic radical awareness of collegiate Vietnamese CFL learners at elementary, intermediate, and advanced Chinese level, indicating that the CFL learners in Vietnam have not developed automatic semantic radical awareness until advanced level and the development of such knowledge depends on teachers' systematic instruction on Chinese characters.

In addition, there are many studies on CFL/CSL learners' Chinese orthographic awareness which also plays significant role in learning Chinese characters. In brief, CFL learners seem to follow the similar developmental trend as L1 children, with the awareness of Chinese writing specificity appearing at an early stage and different aspects of character orthographic

knowledge developing asynchronously (Loh et al., 2018; Shen & Ke, 2007; Wang et al., 2003). Many researchers employed the lexical decision or component decomposition or character judgment and composition tasks to investigate the acquisition of different types of orthographic knowledge, and the relationship to their first language (L1) background and second language (L2) Chinese proficiency. In spite of these fruitful research findings, there remain several controversial conclusions which may confuse the readers. For example, some researchers suggest that the knowledge of component position regularity was more difficult to acquire than the component knowledge (Loh et al., 2018; Wang et al., 2003), but other scholars found the contrary results (Hao, 2007; J. Zhang, 2016); some researchers propose that the orthographic awareness in different structural characters may develop differently (J. Zhang, 2016), while other scholars found the dominance of left-right structure (Feng, 2006), or there might be no structural type effect in Chinese character recognition at the initial stage (Lu, 2002).

The second part reviews some studies on CHL learners' Chinese character learning and comparisons with non-CHL learners. Compared with the empirical studies on CFL/CSL learners, the number of studies on CHL learners is limited at present. There are a great number of studies focusing on Chinese character acquisition by Chinese children and CSL learners, but only a few specifically explore the Chinese heritage language learners, who were usually divided into the CFL/CSL group in prior research.

Some early research found that there were no significant differences in Chinese reading and writing skills between the CHL and non-CHL learners. For example, Ke (1998) conducted the Chinese character recognition and production tests among the college students with and without Chinese heritage backgrounds, finding that the language background played no roles

in Chinese character reading and writing of either English-Chinese bilingual groups or native English speakers. In a serious of Chinese language achievement tests (e.g., vocabulary quizzes, mid-term and final examinations, etc.), Xiao (2006) compared the comprehensive Chinese proficiency in various skills among CHL and non-CHL learners and found no advantage of CHL learners in vocabulary learning, reading, and Chinese character writing. It seems that the aural-oral exposure at home did not facilitate CHL learners' acquisition of Chinese reading and writing skills as Chinese characters are difficult to learn.

However, some scholars proposed different views. One reason could be that these studies mainly focused on the elementary Chinese learners and did not investigate the developmental trend between the CHL and non-CHL groups. In general, it was argued that the characteristics of CHL students make their Chinese character acquisition trajectory different from non-CHL students, but similar to that of primary school students in China (Li, 2006). Li (2006) collected 301 CHL students' written work and did error analysis, finding that the errors produced by pronunciation interference accounted for a tiny proportion, and the character component error was more than the stroke error, and there were many incorrect characters because of the lexicon interference. These phenomena were different from non-CHL learners. Chen (2019) compared the radical awareness development trajectory of CHL and non-CHL elementary learners in a U.S. university, through the "radical identification", "radical analysis" and "radical manipulation" tasks in a 15-week longitudinal study, finding that though the two groups of students performed similarly in the radical identification and analysis tasks at first, CHL learners developed better radical awareness than their counterparts after learning Chinese for a period, and they composed more correct characters using the assigned radicals and single-characters in the radical manipulation task. The author proposed that the CHL learners' good command of Chinese characters could somewhat be

explained by their better oral linguistic knowledge, but he did not provide empirical evidence to substantiate this view. In a relevant comparative study on vocabulary development, Zhang & Koda (2018) invited 37 CHL college students and 25 non-CHL college students (at intermediate Chinese level) to participate in a series test of word knowledge, finding that the CHL learners had some advantage in oral vocabulary knowledge and morphological awareness than non-CHL learners. These subskills could also play important roles in Chinese character and word reading.

Additionally, there are two studies focusing on the Southeast Asian learners of Chinese, which are most relevant to the present study. In a study on Chinese orthographic awareness of the CHL and non-CHL learners, J. Zhang (2016) administered a pencil-and-paper test in which participants were asked to judge the pseudo-characters and non-characters. She reported that, in general, there seem no significant differences in the formation and development of Chinese character orthographic awareness between the two groups, but CHL learners, to some degree, had better orthographic awareness of character components and its positional constraints at the elementary and intermediate stage. Some limitations were indicated in this study, for instance, the author did not consider the participants' various native language and backgrounds, which could be the confounding factors that affect the results. Moreover, the participants in her study were from different Southeast Asian countries who were studying in Mainland China. This diversity of students' backgrounds may make it difficult to apply the research findings into the practical teaching in different contexts. Cheng (2020) compared Chinese orthographic awareness between 30 CHL and 30 non-CHL learners in southern Vietnam by administering a background information questionnaire and a time-limited character decision test online. She found that both CHL and non-CHL learners have some knowledge about the Chinese character configuration and structures, while their

component position awareness seems to lag behind. They showed relatively synchronous development in the orthographic awareness of characters in left-right and top-down structures. On the other hand, CHL learners performed better orthographic awareness in respect of the character configuration and component position regularity than non-CHL learners. Non-CHL learners, but not the CHL learners, were influenced by the stroke number effect when identifying the component position, namely that they made more correct choices for those characters with fewer number of strokes. Additionally, we are informed by the survey results that CHL learners have more opportunities to access Chinese in the family and communities. The statistical analysis implies that the frequency of CHL learners watching Chinese TV programs, writing characters after class might associate with their better development of Chinese orthographic awareness at this stage. In sum, the pilot study demonstrates that there could exist some differences in Chinese character recognition between the CHL and non-CHL learners, and the Chinese character-contact environment seems to associate with CHL learners' better performance. However, there might exist great individual difference, because of the small sample size. And the test materials should be revised to collect more in-depth data. Further research may need to investigate how the learning environment (i.e., family contexts, class instruction, learning materials) influence the CHL and non-CHL learners' Chinese character reading development.

Unfortunately, there is a scarcity of studies mainly focusing on the comparison of Chinese character development between CHL and non-CHL learners. Instead, some studies related to Chinese character recognition have indicated the unique characteristic of CHL learners. The CHL learners' Chinese reading abilities might be significantly influenced by their early language input, including both oral and print Chinese (H. Zhang, 2016). A further study of Zhang & Koda (2021) investigated the influence of early oral language on CHL learners'

reading development, finding that only the oral vocabulary knowledge facilitated the development of morphological awareness and print word knowledge directly. And Chinese character recognition is the basis of print vocabulary knowledge and other Chinese reading capacities.

Over the last two decades, a great number of empirical studies pertinent to learning Chinese as a heritage language have been conducted in the USA, but only a few in other countries and regions. There are also many Chinese immigrants in Southeast Asia whose descendants are learning Chinese at the local schools. J. Zhang (2016) indicates that many CHL learners in Southeast Asia have some exposure to the formal or informal Chinese instruction in varying degrees, so that Chinese characters may not be totally unfamiliar to them, which makes their Chinese character acquisition attractive to many scholars. Hence, the asymmetric scholarly publications on CHL learners between America and other countries, and the large number of Chinese language learners in Southeast Asia, together fascinate me to investigate the status quo in one Southeast Asian country - Vietnam.

Vietnam and China are connected by the common mountains and rivers. In ancient times, Vietnamese people had borrowed Chinese characters to create their own square characters. Nowadays, some Chinese characters are still seen in the ancient architecture in Vietnam. Nevertheless, due to the historical, political and practical reasons, Vietnamese characters had been superseded by the alphabetic writing system since the later stage of the 19th century (Chen, 2018). Today, Vietnamese locals have little knowledge about the ancient characters which are very distinctive from their current written language (Nguyen et al., 2017). In this context, L2 Chinese learners in Vietnam may struggle with learning Chinese characters the same as English language speakers. However, a dearth of appropriately tailored textbooks

and workbooks is currently provided for the Chinese language learners in Vietnam, and not enough attention has paid to the Chinese character learning (Chen, 2018; Zhou, 2019).

In sum, compared with non-CHL learners, it is indicated that CHL learners' early exposure to aural-oral Chinese and some impression on print Chinese may contribute to their later literacy development (Chen, 2019; Li, 2006; Zhang & Koda, 2018, 2021). Seeing that there are a great number of studies on Chinese character reading and writing of CFL/CSL learners, but insufficient research on the comparisons between CHL and non-CHL learners, and the extant studies on CHL learners focused on the sub-knowledge development in processing Chinese characters, thus a comprehensive comparison in Chinese character reading or writing should be put on the agenda. Reading and writing Chinese characters involve different complex cognitive mechanism, as the reading process needs learners to match the information stored in their brain to the given image of that character while writing needs learners to retrieve the specific configuration and reproduce that character (Jiang, 2007; Ke, 1996), the scope of the present study lies in character reading development.

2.4 L2 learning motivation, frequency, and L2 achievement

2.4.1 L2 learning motivation and L2 achievement

To better know our students, in addition to investigating their linguistic development in learning Chinese, recent studies have turned to focus more on learners' individual factors in

the social and contextual environment. Based on Spolsky's (1985, 1989, 1989) general model of second language learning, L2 learners' motivation plays a significant role in L2 learning outcomes. As one important factor, motivation plays a critical role in L2 Chinese learning. Albeit some scholars have mentioned that L2 Chinese learners' better development of Chinese orthographic knowledge might associate with their higher learning motivations and positive attitudes (Chen, 2019; J. Zhang, 2016), no more quantitative or qualitative evidence so far can be reached in the study of Chinese character learning by CHL and non-CHL learners. To this end, the present study intends to integrate the motivation factors of language learning into my conceptual framework, committing to exploring the relationship between the CHL and non-CHL learners' motivation in learning Chinese and their character recognition achievement.

L2 learning motivation is an internal drive for a person to put efforts to achieve some goals in learning a new language. Corder (1967, p. 164) indicates that "*given motivation*, it is inevitable that a human being will learn a second language if he is exposed to the language data" (as cited in Dörnyei & Ushioda, 2009, p. 1). Motivation not only provides the primary incentive for initiating L2 learning, but also for sustaining a long and wearisome learning process (Dörnyei, 2005). Language learning motivation is of complex nature, influenced by internal and external factors, and is not static during the whole learning journey, the critical role of which in second/foreign language acquisition is impossible to ignore. The next part will give a brief review of the development of L2 motivation theories.

The most initial well-known theory on L2 motivation is Gardner's (1985) "socio-educational model of second language acquisition". In this model, L2 learning achievement is mainly influenced by integrativeness and attitudes toward the learning situation and some other

factors. In their framework, the core concept is integrative motivation, which is defined as "reflecting a sincere and personal interest in the people and culture represented by the other group" (Gardner & Lambert, 1972, p. 132). Early theories on L2 motivation highlight the "integrative" and "instrumental" orientations, with the former referring to L2 learners' interest in successfully integrating into the cultural community of the target language, and the latter referring to the pragmatic and utilitarian benefits from learning that language (Gardner & Lambert, 1972; Gardner, 1985). Gardner and his associates extended and modified the socio-educational model in later years (see Gardner, 2001;) by adding more factors, such as "goal salience, valence, and self-efficacy" (Tremblay & Gardner, 1995), and refining the model with integrative motivation and language aptitude, as well as other factors, together influencing language achievement (Gardner, 2001, p. 4). In short, the central concept is still the integrative motivation in socio-educational model of second language acquisition. Nevertheless, with the growing trend of global English learning, this L2 motivational model gradually garnered much debate. One main concern was that whether there is no specific group of people speaking the target language in a specific culture (Dörnyei and Ushioda, 2009, pp. 2-3). Yashima (2002) expanded the integrativeness to an "international posture", which refers to the foreign language learners' interest in and willingness to get involved in international study or work and interact with people from different cultures. Moreover, this theoretical framework was extended by Dörnyei and his colleagues. They supplemented more elements, such as "learners' attitudes, self-confidence and cultural interest, vitality of the L2 community, milieu" (Csizér and Dörnyei, 2005).

After the socio-educational model, self-determination theory came to scholars' eyes. As psychologists, Deci and Ryan (2002) indicates that growth and integration are human beings' intrinsic tendencies that interact with social contexts to motivate or hinder people's behaviors.

The self-determination theory consists of intrinsic motivation, extrinsic motivation, and amotivation (Deci & Ryan, 1985). This is more used in the psychology field.

As we are living in a globalized multilingual world today, the theory of L2 motivation has witnessed a shift from an external stand to an internal perspective. Recent decades, the new orientation in this field turns to focus on L2 learners' Motivational Self System, in which the ideal L2 self, ought-to L2 self and L2 learning experience are three chief components to explain the motivation of learning a foreign/second language. The ideal L2 self refers to learners' desire to become a target-like speaker; the ought-to L2 self refers to learners' attributes to meet the expectations from their social environment; and the L2 learning experience refers to learners' positive engagement in their L2 learning process (Dörnyei and Ushioda, 2009, 2011). Drawing on the "possible selves" (Markus & Nurius, 1986) and "self-discrepancy" (Higgins, 1987) theory in psychology, Dörnyei (2005) proposed this new outlook on L2 learning motivation, with the "ideal self" being the core concept.

In addition, other scholars have started to reconsider the nature of L2 motivation in the postmodern era, as identity becomes a hotspot in L2 research. Identity is a key notion in second language acquisition, which connects the language learners with their learning contexts. Norton (2000) suggests that identity refers to how the learner views the dynamic relationship between himself/herself and the living context, constructed with time and space, and possible attributes in the future. She proposes the "investment" concept in L2 motivation field, which the learners construct their relationship to the target language socially and historically. If a learner invests in learning a second/foreign language, he/she would like to possess such soft resources that can enhance their social identity and cultural capital. The L2 learners' investment in learning the target language is closely connected with their complex

identities which may change in different social interactions and practices (Norton & Toohey, 2011).

In summary, anyone who learns a second/foreign language has his/her own goals and motivation. Without sufficient motivation, one would find very hard to persist in learning the target language for a long time. Meanwhile, L2 motivation is changing with time and space, subject to the learners' relationship to their social contexts. Based on a brief review of L2 motivational theories, these models or frameworks remind us of the important relationship between the L2 language development and leaners' subjective initiative in their living experiences. As L2 Motivational Self System (L2MSS) sees the language learners from the individual's self stand, and it "represents a major reformation of previous motivational thinking" (Dönyei, 2009, p. 9). This framework will be used to gauge the motivational factors of the CHL and non-CHL learners in this study. The present study focuses on the comparisons between the CHL and non-CHL learners who grow up in different family and community context, thus their motivational orientations are worthy of attention in Chinese learning achievement.

A large body of literature focuses on the motivation and English as a second/foreign language learning achievement. The next part will review some literature on the relationship between the motivation and L2 learning achievement.

Most research has examined the relationship between L2MSS factors and learners' intended learning efforts and found strong correlations, supporting Dörnyei's L2MSS theory (e.g., Ryan, 2008; Taguchi et al., 2009). However, the intended learning efforts is only the predictive of L2 learners' proficiency not the actual achievement in the target language

(Moskovsky et al., 2016). There are some studies incorporating the learners' language proficiency test grades and investigating the relationship between their learning outcomes and L2MSS variables, but the research findings are not consistent.

Some studies found a very weak or even negative influences on L2 learning outcomes. For instance, in a study of 360 Saudi learners of English, Moskovsky et al. (2016) researched the participants' IELTS reading and writing test scores and L2MSS components. They employed multiple regression analyses to suggest that the ideal L2 self, the ought-to L2 self, and the L2 learning experience could better explain their intended English learning efforts, but there were weak and negative correlations between the learners' intended learning efforts, ideal L2 self and their English reading and writing scores. The authors attributed these unusual results to three speculations that the learners with low proficiency tended to exert more future efforts for better career development and social status improvement in the Saudi context, and the IELTS reading and writing test scores might not reflect their actual L2 achievement, as well as the participants were all at lower grades. Subekti (2018) did not find strong correlations between the ideal L2 self, ought-to L2 self, L2 learning experience and the composite English scores of 56 Indonesian college students. Also, under the influence of Covid-19 pandemic, Rahardjo & Pertiwi (2020) found a low correlation between the learning motivation of 84 senior high school students and their English achievement in Surabaya. Additionally, some researchers found that there was no influence of the ought-to L2 self (Calafato & Tang, 2019; Khan, 2015; Moskovsky et al., 2016) or a negative effect of the ought-to L2 self (Al-Hoorie, 2016) on L2 achievement.

On the contrary, in some studies, the researchers have found that the core components of L2MSS might have some positive effects on L2 learning achievement, directly or indirectly.

For example, Lamb (2012) conducted a questionnaire and a C-test in English proficiency (completing sentences and filling in the missing words in texts) to compare the relationship between L2MSS components and L2 English proficiency among 527 young adolescents in the city, town, and countryside. The results revealed that L2 learning experience was strongly correlated with the participants' intended learning efforts and current English achievement, and the relationships were different in socioeconomic contexts with ideal L2 self only significant in metropolitan group of students. In Saudi English as a foreign language courses, Khan (2015) conducted a questionnaire and semi-structured interview to explore the relationships between the L2MSS constructs and English test proficiency among 100 female elementary learners, which suggest that the ideal L2 self were more strongly correlated to formal L2 achievement than the ought-L2 self, with the latter only having a significant role in their intended learning efforts. Yun et al. (2018) found an indirect positive effect of the ideal L2 self on L2 achievement of 787 Korean adult learners of English, with the "buoyancy" as the mediator. Moreover, Morea (2020) inquired the relationships between L2MSS variables and L2 French performance of English secondary students. The survey results and French test grades of 397 participants revealed that the three components of L2MSS were all significantly correlated with their L2 performance with the ideal L2 self being the most important variable. In another study of 545 undergraduate Japanese learners of English, Takahashi and Im (2020) compared the relationships between the motivational constructs, intended learning efforts, and L2 English achievement under the L2MSS and self-determination theory, finding the powerful predictor of L2 learning experience and learners' intrinsic motivation. Likewise, Zhang et al. (2020) identified that the foreign language enjoyment mediated the positive effects of instrumental and integrative motivations on second foreign language learning achievement by analyzing a self-reported survey data among 335 Chinese tertiary students of diverse foreign languages.

To summarize, a foreign language learner can easily give up without sustainable motivation to learn the target language. The past decades have witnessed several shifts in L2 motivational framework, and L2MSS has become a recent popular theoretical basis supported by many empirical studies in the ESL/EFL field. Although the three L2MSS components are found to be good predictors in the intended learning efforts to varying extent in a great number of studies, their effects on actual L2 achievement have been in debates so far. Furthermore, only a handful of studies have investigated the relationships between L2MSS and other language learning achievements than English, which leaves us more room to explore.

2.4.2 L2 learning frequency and L2 achievement

In the cognitive perspective, L2 learning is seen as the "extraction of meaningful patterns from environmental stimuli, via all types of sensory perception" (Mitchell et al., 2019, p. 129). One recognized theory "Emergentism" views L2 learning as a process in which the learners use their cognitive learning mechanisms to obtain the patterns from the daily language input, and this process is said to be affected by many factors, such as frequency and salience in L2 input, and the learners' own features (Mitchell et al., 2019, p. 129). Frequency is one of the critical input-related factors that contributes to both L1 and L2 learning (Schmitz, 2010). It refers to the times that the target language items appear in the L2 learners' input. In different linguistic domains, the frequency effects are highly correlate to language processing (Ellis, 2002). Generally, "the more times a stimulus is encountered, the faster and more accurately it is processed" (Ellis, 2006, p. 5). In other words, if the target linguistic

features occur more frequently in daily language input, the learners are more easily to identify and learn that knowledge. On the other hand, the input cannot automatically become intake that is completely absorbed by the language learners, and other factors also matter a lot, such as salience, outcome importance, etc. (Ellis, 2006). Therefore, it is important to attract the learners' selective attention from the frequent, salient, and meaningful language input.

A related well-known theory is incidental learning in L2 vocabulary acquisition. Paribakht & Wesche (1999) indicates that incidental vocabulary learning refers to a natural learning process when learners acquire the knowledge of new words in hearing or reading something instead of merely focusing on vocabulary learning. This process has been found in both L1 and L2 word knowledge development (Dupuy & Krashen, 1993; Shu et al., 1995). Due to the slow and partial effects on word acquisition and retention, the effectiveness of incidental learning has engendered controversy among scholars (Laufer, 2003; Read, 2004), but many researchers and practitioners reached a consensus that it is an essential approach to supplement word learning, and the knowledge acquired through this way is accumulated, from an initial form impression to form-meaning connections occurred repeatedly in various contexts (Nation, 2013; Schmitt, 2010; Schmitt & Schmitt, 2020; Webb, 2007). However, there is an inconvenient fact that the effectiveness of exposure frequency would gradually be insignificant as time goes on (Webb & Chang, 2015). Also, Von Stutterheim et al. (2021) indicates the limited effects of the occurrence frequency in L2 acquisition and foregrounded that the "conceptual framing" might play a more important role than frequency. In other words, both the explicit instruction of linguistic knowledge and implicit learning are essential in successfully learning a foreign language.

A large body of literature focuses on the frequency and English as a second/foreign language learning achievement. The subsequent paragraphs will review some literature on the relationship between the frequency of exposure and L2 learning achievement in different linguistic domains, and then followed by a few studies on the relationship between the motivation, frequency, and L2 learning outcomes.

A great number of empirical studies have supported the frequency effects in second/foreign language learning with respect to the acquisition of lexical knowledge. For example, Fernández & Schmitt (2015) investigated the correlations between the collocation knowledge of 108 Spanish speakers learning English as a L2 and the collocation frequency in corpus, and everyday extracurricular English activities, finding that L2 English learners' collocation knowledge was moderately correlated with corpus frequency (r = .45**) and highly related to daily English engagement (r = .56**). It suggests that we should encourage L2 learners to participate in more daily English-based activities to facilitate their collocation learning. Frequency has been an important basis for vocabulary selection in L2 pedagogy for a long time (Schmitt & Schmitt, 2014), and it is widely accepted as one significant predictor to successful vocabulary acquisition (Leech et al., 2001; Schmitt, 2010). Mohamed (2018) conducted an eye-movement and extensive reading research to investigate the influence of exposure frequency on L2 English vocabulary reading, in which 42 advanced L2 English learners of diverse majors participated in an eye-tracking task, vocabulary posttests, and reading comprehension test. The results showed that the L2 readers were more easily to process the 20 familiar words than pseudo words and their fixation times decreased with the vocabulary repetition increased. This study highlighted the significance of engagement in L2 incidental word learning and exposure frequency, but the author also emphasized that the results only reflected an immediate learning achievement.

In addition to L2 vocabulary and collocation acquisition, the frequency effects are also seen in many other studies on phonology, morphosyntax, syntax, grammaticality, reading, spelling, and so forth (Ellis, 2002). For example, Collins et al. (2009) conducted a corpus study to investigate the correlations between the input frequency and the acquisition of English progressive, past tense, and possessive determiners among adolescent L2 English learners, finding that the high frequency exposure in vast amounts and situations could explain why progressive forms are acquired before the past-ed and possessive determiners to some extent. On the other hand, the early studies did not consider the L2 learners' L1 backgrounds and some other individual differences. Besides the input characteristics, there are many other potential factors that could affect L2 morpheme learning achievement, such as L1 influences, prior knowledge, and individual diversity (Mitchell et al., 2019, p. 132). Furthermore, in a L2 English listening comprehension study of 167 Chinese college students, Matthews & Cheng (2015) investigated the relationship between their IELTS listening test scores and the identification of oral high frequency words, suggesting that these high frequency speech words could predict L2 English learners' aural vocabulary knowledge which is related to the listening comprehension achievement.

In the sub-section 2.4.1, we have reviewed some studies about the relations between L2 motivational orientations and L2 achievement, despite the conclusions being far from consistent. In this sub-section, we have also learned that the exposure frequency has been recognized as one significant element participating in the contribution to L2 learning outcomes. It hardly can prohibit us from thinking about the interactive roles of learners' motivation, frequency, and L2 achievement. There seems not much research has scrutinized such interactions to my current knowledge. In a study of examining the different

effectiveness of potential factors (including L2 learners' motivation, self-perceived communicative competence, willingness to communicate, and anxiety) on the frequency of oral English communication, Ghani and Azhar (2017) employed questionnaire research among 123 postgraduate L2 English learners in Pakistan, finding that motivation was the third positively significant factor that explained the frequency of using English in communication (r = .32*). However, they adopted a simple version of Gardener (1985)'s Motivation Attitude Test Battery to measure the participants' L2 motivation which has been regarded as out of date. Moreover, in a similar study of Lao (2020), she analyzed the survey data of 59 adult ESL learners in New York, which showed a positively moderate correlation between L2 self-guides motivation and the learners' frequency of communication in English (r = .46*). Nonetheless, the sample size in Lao (2020)'s questionnaire investigation was rather small, and the participants were of diverse L1 backgrounds and L2 proficiency levels.

To recap, as one significant input-related factor, frequency of exposure is conducive to L1 and L2 learning. Considerable studies have examined the frequency effects on L2 acquisition in vocabulary, collocations, phonology, morphosyntax, syntax, etc. Also, incidental vocabulary learning serves as an essential accumulative process to facilitate word acquisition. The more frequently one gets access to the target language in daily contexts, the more possible s/he can process the salient features under conscious and unconscious learning. However, only the exposure frequency is far from enough, as language input usually cannot be translated into 100% intake by language learners. Other input characteristics and individual factors interactively affect L2 learning outcomes, and the implicit and explicit language instruction also play important roles. In addition to the important relationship between the language encountering frequency and L2 achievement, some scholars also indicate the significant correlation between the learners' motivation and their frequency of L2

use. Together, considering from the learners' perspective, I incorporate the input-related factors, L2 learning motivation, and L2 achievement in this study.

Draw on the theoretical framework on input processing, exposure frequency, and incidental learning in second/foreign language acquisition, it leads me to rethink L2 Chinese character learning under such conditions. Different from English or French vocabulary, Chinese words consist of single characters, and disyllabic words account for a large proportion in modern Chinese. CSL/CFL learners normally learn Chinese characters in lexical contexts. Seeing that CHL and non-CHL learners may have different incidental word learning contexts and exposure frequency to encounter Chinese words, thus their frequency of extracurricular Chinese activity engagement is taken into consideration in this study. It is regarded as the informal opportunity to learn Chinese characters in my conceptual framework.

2.4.3 Motivation, frequency, and Chinese learning achievement among CHL and non-CHL learners

In this sub-section, I will first illustrate the comparisons between the CHL and non-CHL learners' motivation in learning Chinese, and then review the extant literature on the relations between motivation, input frequency, and CSL/CFL learning achievement, and end up with some comments, and questions remained underexplored.

Previous studies have found the differences and commonalities in Chinese learning motivation between the CHL and non-CHL learners. By administering the questionnaires and interviews, Wen (2011) investigated the Chinese learning attitudes and motivation of 317

college students enrolled in the Chinese programs at three American universities. The author found that the instrumental motivation, positive learning attitudes and experience are the main factors facilitating L2 Chinese learners to pursue Chinese studies, but CHL and non-CHL learners presented large differences in terms of socio-cultural interactions and learning situations. Heritage learners engage in more cultural activities at home and the community, whereas non-heritage learners tend to have a sense of fulfilment in learning a challenging language and are more motivated by the satisfying learning experiences. Xie (2014) demonstrates the differences between the CHL and non-CHL learners' motivations under the L2 Self System, in respect of family influence, the ought-to L2 self, the ideal L2 self and the international posture. This study underscores the significant roles of the home environment and intergroup interactions played in shaping L2 learners' dynamic attitudes toward Chinese language learning. Lin (2018) designed and tested the L2 Chinese motivational Self System scale for the CFL and CHL learners, finding that they are different in the ideal L2 self, ought-to L2 self, L2 Chinese learning experience, family influence and intended effort, but not on the instrumentality motivation. Furthermore, it has been suggested that CHL learners' motivation is driven by their perception of the economic capital of mastering Chinese in recent years (Xu & Moloney, 2014). By conducting focus group discussions and individual interviews with the students, teachers, and parents, Kurniawan & Suprajitno (2019) inquired diverse motivations to learn Chinese of 16 Indonesian CHL learners, and found that the instrumentality of Chinese, their ethnic background and perceptions of China's rise stimulate them to make sustained efforts in learning Chinese.

Compared with the great volume literature on the relationships between L2 motivation, frequency, and L2 English achievement, only a few studies examined their relations under the context of learning Chinese as a second/foreign and heritage language. Lately, one of the

research foci has paid attention to this area.

To begin with, there are a few studies on L2 motivation and Chinese learning achievement by comparing CHL and non-CHL learners. Lu and Li (2008) conducted a comparative study on the relationship between different motivational factors and Chinese proficiency test scores among 59 collegiate CHL and 61 non-CHL students in U.S. They found that the integrative motivation was highly correlated to students' learning outcomes, and CHL learners were more influenced by instrumental motivation and less influenced by situational motivation than their non-CHL peers. This suggests that different motivational orientations might play various roles in CHL and non-CHL learners' Chinese language achievement. Under the L2MSS framework, Tan et al. (2017) examined the relationships between the three L2MSS components and the Mandarin learning achievement of Malaysia college students and found that only L2 learning experience was significantly correlated with L2 Chinese attainment, neither the ideal L2 self nor ought-to L2 self. Conversely, Wong (2018) proposed that only the ideal L2 self was significantly related to L2 Chinese reading achievement, and the L2 selves could predict the L2 achievement under the mediating effect of motivated behavior, by conducting the structural equation model analysis of the relations among L2 self-guides, motivated behavior, and L2 reading comprehension development of 121 CSL primary students in Hong Kong. In the followed research, Wong (2020b) conducted a more complex structural equation modeling to shed light the interrelationships between the overall L2 Chinese proficiency and L2 selves motivation of ethnic minority primary students: young CSL learners' self-perceived proficiency predicted their intended learning efforts with the ideal L2 self as the mediator, and then facilitated L2 achievement. Also, the self-perceived proficiency had great influence on learners' ideal L2 self instead of the ought-to L2 self.

In a more recent study, Li and Zhang (2021) explored the major L2MSS dimensions of Tibetan learners of Chinese and their Chinese learning achievement, finding that the ideal L2 self positively affected Mandarin learning achievement whereas the ought-to L2 self was negatively correlated to their Mandarin proficiency, and the learning experience acted as mediators in the effects of L2 selves on the intended Mandarin learning efforts. The L2MSS explained 55% of Tibetan students' intended efforts in learning Mandarin while contributed 13% to Mandarin achievement. Although the Tibetan students are native speakers of one Chinese minority language, the Tibetan language is very distinctive from Mandarin (both in oral and print knowledge). Thus, this study could provide some illuminations in motivation-actual learning achievement relations in CSL/CFL and CHL field. On the other hand, due to some reasons like the language policy, learners' sociocultural contexts, etc., the L2 Mandarin leaners speaking Tibetan are not in the same group of the CSL/CFL learners in other countries and regions. Furthermore, Yang and Chanyoo (2022) investigated the relations between L2 learners' motivational self orientations and their intended efforts in learning Chinese, Japanese, and Korean by using the questionnaire and interview measures, the results of which revealed that L2 learning experience was the highest motivational component among CSL learners in Thailand, and there were significantly strong positive correlations between the intended Chinese learning efforts and L2 learning experience (r = .86, p< .001), ideal L2 self (r = .68, p< .001), and promotional instrumentality (r = .65, p< .001).

Secondly, in terms of the frequency accessed to L2 input and L2 development, Zhang, Koda, and their associates have implemented a series of studies concerning the early Chinese input effects on CHL learners' vocabulary knowledge development in the past years. For instance, Zhang and Koda (2011) found that the Chinese character structural knowledge and vocabulary breadth of American Chinese-English bilingual primary school students were

significantly positively correlated to the frequency of their parents' language use and Chinese reading coursework. In another study of 73 collegiate CHL learners in programs of studying in China, H. Zhang (2016) used the language background survey and Chinese reading tasks to shed light on the significantly positive relationship between CHL learners' early Chinese input and their reading achievement. Moreover, Zhang and Koda (2018b) further investigated the relationships between CHL learners' early Chinese exposure and lexical development via conducting a background questionnaire and Chinese word knowledge tests among 195 collegiate CHL learners of intermediate Chinese level studying abroad in Mainland China. The cluster comparative analyses revealed that the early high frequency of exposure to print Chinese had positive effects on later print word knowledge than the low frequency of input. Additionally, in view of input-based approaches, Li (2012) conducted a quasi-experiment of 30 CSL learners of diverse L1s to examine the input practice effects, finding that different frequency of instructional input processing had different contribution to L2 Chinese pragmatic acquisition of requests. In a latest eye-tracking study, Yi (2022) supports the effects of incidental vocabulary learning on novel Chinese compound word processing by alphabetic language learners of Chinese. Of course, individual learner variables also played some roles, such as the participants' L2 vocabulary size.

In addition, one journal paper discussed some relationships between the L2 self motivation and after-class Chinese engagement in the CSL context. In a latest study of Wen (2022), she and her associates conducted mixed research to investigate college-level CSL learners' motivation and their extracurricular learning situation in the U.S. By analyzing 120 questionnaires and interviewing 27 participants, Wen (2022) suggests that the core constituent of L2MSS – the ideal L2 self was the most highly correlated to the intended positive learning efforts ($r = .67$, $p < .01$), and significantly correlated with communicating in

Chinese ($r = .29$, $p < .01$) and doing Chinese coursework ($r = .32$, $p < .01$) outside of class. Her study reveals the interactions among L2 Chinese motivation, learning contexts, and CSL learners' experience.

By and large, according to these empirical studies, we understand the similarities and differences between the CHL and non-CHL learners' motivation to learn Chinese (normally Chinese Mandarin), and the latent positive interrelationships between the L2MSS components and L2 Chinese learning achievement, as well as the input frequency. On the other hand, although thousands of studies have supported the significant roles of L2MSS variables in sustaining L2 learners' intended efforts, the research conclusions have hardly reached a consensus yet among the relations between the ideal L2 self, ought-to L2 self, L2 learning experience and the actual language proficiency in L2 Chinese. Moreover, the mid-term and final-term Chinese test results were used in the previous studies to indicate the CSL/CFL learners' L2 achievement. And most participants were from different L1 backgrounds and Chinese proficiency levels. These might be one or two reasons leading to the various conclusions. In addition, although a series of scholarship works suggest that the early exposure frequency could have important influence on CHL learners' Chinese word learning achievement, few studies investigated the relationships between the CHL learners' frequency of after-class exposure to Chinese and their language achievement and compared with non-CHL learners. Also, a scarcity of research has focused on the correlations between the L2MSS factors and the frequency of extracurricular Chinese activity engagement among CHL and non-CHL learners. Moreover, substantial studies researched the motivation and frequency effects on Chinese vocabulary acquisition by CSL/CFL learners, but no extra specific attention has been paid to their relations with Chinese character reading development. Chinese is widely recognized as challenging to learn often because of the

representation of its complex writing scripts, to which my study is going to find some relations with individual dimensions if there are. In short, in spite of these current findings, we know little about whether and how the L2MSS and the informal exposure frequency can promote the CHL and non-CHL learners' Chinese character learning achievement. Therefore, this study expects to answer this inquiry with specialty to Chinese character reading development in this thesis.

2.5 Chapter summary, research gap and questions

2.5.1 Chapter summary

This chapter introduced the main theories and many previous studies in relation to this study. There are three main sections: reading Chinese characters, CHL and non-CHL learners, L2 learning motivation, frequency and L2 achievement. A summary is as follows.

Firstly, Chinese characters are the written symbol for recording the oral Chinese language. The nature of Chinese characters is morphosyllabic written symbols. As the basic unit of the logographic writing system, Chinese character is of two-dimensional structure, comprising of strokes and components. And radicals are the functional constituents in compound characters cueing the meaning or pronunciation of that character. In terms of the formation methods of Chinese characters, there are four major types: pictographs, self-explanatory characters, associative compounds, and phonograms. Chinese characters are the basic unit of word

formation. For those characters with independent meaning, one character is a word; for those characters that cannot be used independently in a sentence, we usually add another character to form a word. The two-character words account for a dominant position in modern Chinese.

The pronunciation and meaning of a Chinese character are the pronunciation and meaning of the word represented by that character. Reading Chinese characters involves three dimensions: orthography, phonology and meaning. It refers to retrieving the pronunciation and meaning in brain when looking at its orthographic form. What makes character recognition difficult is that one may not pick up the phonological information directly from the character's orthography. When learning Chinese characters, the learners should grasp the Chinese orthographic knowledge, semantic and phonetic radical awareness, and morphological awareness, which help them decode the single characters in words. Additionally, Considerable studies have provided evidence to support that the explicit instruction or guided inductive instruction could be effective approaches for teaching Chinese characters in CSL/CFL classes. In Vietnam, the Chinese character teaching has not been paid much attention due to the limited class time, and there is a shortage of appropriate textbooks and workbooks for the local students to learn Chinese characters.

Secondly, CHL and non-CHL learners are different in nature and live in different sociocultural contexts, but there are also some commonalities in their Chinese language development and the social-psychological realm in learning Chinese. CHL learners grow up in a non-Chinese speaking country but can speak or at least understand some Chinese at home, and they have some ethnolinguistic connections to Chinese cultural heritage but are equipped with a wide range of imbalanced Chinese linguistic skills. Non-CHL learners are those who have no affiliations to the Chinese language and culture at home and learn Chinese

as a foreign or second language under formal instruction. These two groups of learners have differences and similarities in the nature of different types of international Chinese education, Chinese language use and development, L2 motivation, anxiety, and identity. With a special attention to Chinese character learning, a great number of studies have investigated Chinese character reading and writing of CFL/CSL learners, and the current studies on CHL learners focused on the sub-knowledge development in processing Chinese characters, but there are few related studies comparing the CHL and non-CHL learners.

Thirdly, as two important factors, motivation and frequency play significant roles in L2 language learning. Actually, they are all learner-related considerations. Different social contexts could shape different attitudes and motivation toward the target language and provide different frequency of exposure for CHL and non-CHL learners. L2 learners' motivation is shaped and changed in different specific sociocultural contexts (Dörnyei & Ushioda, 2011; Norton, 2000; Taguchi et al., 2009).

Foreign language learning is a life-long journey, and one can hardly persist in it without enough motivation. L2 learning motivation is an internal drive for a person to put efforts to achieve some goals in learning a new language. It not only provides the primary incentive for initiating L2 learning, but also for sustaining a long and wearisome learning process. The L2 Motivational Self System has been supported in many CHL studies. There are three core components: the ideal L2 self, ought-to L2 self, and L2 learning experience. The ideal L2 self refers to learners' desire to become a target-like speaker; the ought-to L2 self refers to learners' attributes to meet the expectations from their social environment; and L2 learning experience refers to learners' positive engagement in L2 learning process. Hundreds of studies have advocated the significant influence of L2MSS variables on L2 learners' intended

efforts in learning the target language, but their effects on actual L2 achievement have been in debates so far. And only a few studies have investigated the relationships between L2MSS and other language learning achievements than English.

Moreover, frequency is one of the critical input-related factors that contributes to both L1 and L2 learning. If the target linguistic features occur more frequently in language input, the learners are more easily to identify and learn that knowledge. Besides, the incidental vocabulary learning, a natural learning process when learners acquire the knowledge of new words in hearing or reading something, was found to promote L1 and L2 word knowledge development. A great number of empirical studies have supported the frequency effects in second/foreign language learning with respect to the acquisition of English vocabulary, phonology, morphosyntax, syntax, reading, spelling, and so on. Also, previous studies have found the significant correlation between the learners' motivation and their frequency of L2 use.

Moving to the motivation, frequency, and Chinese learning achievement of CHL and non-CHL learners, likewise, previous studies suggest that they share differences and commonalities in Chinese learning motivation. For example, CHL and non-CHL learners have no differences in instrumental motivation, but are different in the ideal L2 self, ought-to L2 self, L2 Chinese learning experience, family influence. Different studies may focus on different orientations. Furthermore, many studies have found that the L2MSS components are good predictors to the intended efforts but have reached inconsistent results in explaining the relationships between L2MSS and L2 Chinese achievement. Additionally, prior studies provided some evidence to emphasize the significantly positive role of early exposure frequency in CHL learners' language development. Moreover, one study found that the ideal

L2 self was significantly correlated with the after-class Chinese engagement among collegiate CSL learners. Taken together, the potential relationships among L2 Chinese learning motivation, exposure frequency in learning contexts, and L2 Chinese achievement are worthy of further scrutiny.

2.5.2 The present study, research gap and questions

The present study pays special attention to the Chinese character reading development of collegiate CHL and non-CHL learners in southern Vietnam, attempting to find the correlations between their character reading achievement at different Chinese levels and their Chinese learning motivation and frequency of exposure to Chinese under informal contexts, as well as the influence of their perceptions of formal Chinese character instruction in class and textbooks. To sort out these problems, this study conducted mixed research methods articulated in the next chapter.

In light of the above theories and studies, it can be summarized that Chinese character learning is a dynamic developmental process which involves many analytic processing knowledge, such as the structural types, stroke numbers, semantic and phonetic radical knowledge, component combination regularity, etc. Although thousands of studies have examined Chinese children's character acquisition, there remains much unknown on the CHL and non-CHL learners, particularly in a non-target language environment other than America. Furthermore, in addition to the cognitive development of L2 learners' Chinese character acquisition, to my current knowledge, little is known about the roles of individual diversity played in L2 Chinese character learning, in terms of learners' motivation and their specific

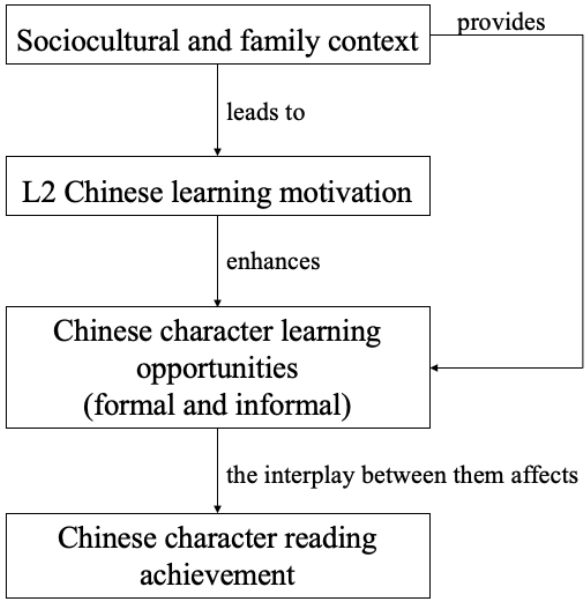
learning situations. It is hypothesized that the CHL and non-CHL learners with different family connections to the Chinese language and culture may somehow vary in relation to Chinese character learning. Moreover, the future research directs to investigate the Chinese character learning process of CHL learners and non-CHL learners at advanced Chinese proficiency levels (Zhang & Ke, 2018).

In addition, although considerable studies have supported the significant roles of L2MSS components in sustaining L2 learners' intended efforts, the research conclusions have hardly reached a consensus yet among the relations between the ideal L2 self, ought-to L2 self, L2 learning experience and the actual L2 Chinese achievement. Moreover, the mid-term and final-term Chinese test results were usually used in the previous studies to indicate the CSL/CFL learners' L2 achievement. And most participants were from different L1 backgrounds and Chinese proficiency levels. Furthermore, although a series of studies suggest that the early exposure frequency could have important influence on CHL learners' Chinese word learning achievement, few studies investigated the relationships between the CHL learners' frequency of after-class exposure to Chinese and their language learning achievement and compared with non-CHL learners. Also, a scarcity of research has focused on the correlations between the L2MSS factors and the frequency of extracurricular Chinese activity engagement among CHL and non-CHL learners. Considerable studies researched the motivation and frequency effects on Chinese vocabulary acquisition by CSL/CFL learners, but no extra specific attention has been paid to their relations with Chinese character reading development. Chinese is widely recognized as challenging to learn often because of the representation of its complex writing scripts, to which my study is going to find some relations with individual dimensions if there are. In a word, after reviewing the literature, we know little about whether and how the L2MSS and the informal exposure frequency can

promote the CHL and non-CHL learners' Chinese character reading achievement. Moreover, few qualitative studies heretofore have explored the CHL and non-CHL learners' perceptions of Chinese character instruction (Wang, 2020, pp. 91-92).

To sum up, I present a general conceptual framework of hypotheses displaying a framework of Chinese character reading achievement by CHL and non-CHL learners in Figure 2 below and propose three research questions to fill the research gaps.

Figure 2 A conceptual framework of hypotheses



Research questions

RQ1: Are there developmental differences in learning Chinese character reading among adult CHL and non-CHL learners in Vietnam? If yes, what are the differences and commonalities?

RQ2: Are the differences in CHL and non-CHL learners' Chinese character reading

achievement affected by their L2 Chinese learning motivation and frequency of extracurricular Chinese activity engagement?

RQ3: Are the differences in CHL and non-CHL learners' Chinese character reading achievement influenced by their views on the formal instruction in class and textbooks? How?

Chapter 3: Research Methods

3.1 Chapter introduction

In detail, this chapter will introduce the participants and settings, research instruments, the pilot study, procedures, data coding and analysis, and the research reliability and validity.

Illuminated by the suggestions in recent review studies, the present study implemented mixed research methods to answer the above research questions. For example, Li (2020) calls for a deep integration of adopting positivist and interpretivist methods for future L2 Chinese character studies in his systematic review of Chinese character teaching and learning from 2005 to 2019. Such a view is echoed by other scholars (i.e., Gong et al., 2020; Ke, 2020). Dörnyei (2007) indicates that the mixed research methods can "expand our understanding of a complex issue" (p. 164). Due to the lack of a well-recognized rating scale on L2 Chinese character instruction in both class and textbooks, to my current knowledge, this study then incorporated the participants' written texts as the qualitative data to address this issue. The CHL and non-CHL learners' views on the formal Chinese character instruction should not be overlooked as they also play an important role in their learning achievement. Also, the qualitative data could provide some insights to supplement the statistical results (Creswell, 2018, pp. 84-85; Flick, 2007, pp. 8-9). In this study, the RQ1 & RQ2 need the quantitative data while the RQ3 needs the qualitative data, together attempting to shed light on a comprehensive picture of the development of Chinese character reading achievement by adult CHL and non-CHL learners in Vietnam and the potential influencing factors.

In brief, an online Chinese character reading test was conducted with each participant to assess their Chinese character learning achievement, and an online questionnaire about the learners' L2 Chinese learning motivation and the frequency of attending extracurricular Chinese activities was used to examine the scale that matches the participants' situation. Moreover, in the questionnaire, there are five open-ended questions about the students' views on Chinese character instruction in class and textbooks. the data collection materials are provided in Appendices A and B.

3.2 Participants and settings

Considering that the majority of ethnic Chinese are living in southern Vietnam, under the help of my supervisors, I contacted several local Chinese teachers at a southern Vietnamese university, where I recruited the voluntary participants by sending emails. Two hundred fifty-three voluntary participants were recruited to join in the questionnaire and Chinese character reading test. Finally, we received 181 valid questionnaires and answer sheets, as some participants did not complete the online questionnaire or withdraw from the Chinese character reading test. Also, we removed the questionnaires finished in a very short time (300-600s).

The participants were college students with different majors at a southern Vietnamese university, including 89 CHL learners and 92 non-CHL learners. There were 144 female students and 37 male students, with 165 at the age of 18-24 and 16 at 25-30. Their first or dominant language is Vietnamese. They were from the different classes of Chinese language

proficiency based upon their HSK (a standardized Chinese proficiency test) level. Since the State Language Commission, Ministry of Education of China released the new HSK 1-9 standards in March 2021 and implemented the document in July 2021, the participants did not take the new HSK test before the data collection. Hence, we still used the old standards to divide them into three groups of Chinese proficiency levels: elementary (HSK1-2), intermediate (HSK3-4), and advanced (HSK5-6). The details are shown in Table 3 below.

Furthermore, the CHL learners in this study are those whose ethnic group in Vietnam is "Hoa" (Chinese origin), with at least one of their parents or grandparents are Chinese native speakers (speaking Mandarin or a Chinese variety). Most of them are the third generation of ethnic Chinese, and they can speak or at least understand some Chinese at home and in the community. Although some CHL learners reported in the survey that they had learned Chinese before entering the university, while some were not, their Chinese proficiency levels were determined by the HSK test and midterm and final exams. Among the non-CHL participants, there were 91 Kinh people and one Khmer student. The CHL and non-CHL learners were allocated to different classes according to their Chinese proficiency levels.

Table 3 Details of the participants

Number of participants	HSK1-2	HSK3-4	HSK5-6
CHL	29	30	30
Non-CHL	31	31	30

Since the students were attending online Chinese classes under the influence of the Covid-19 pandemic, the data-collection settings were on the internet by using online questionnaires, and the online Chinese character reading test. After data collection, I sent the participants

some electronic Chinese learning materials as remuneration.

In addition, the ethical issues on each participant are of great importance in this study. Before the data collection, I secured informed consent from the participants and their Chinese teacher. I fully respected their right and freedom to participate in or withdraw from the research anytime they felt comfortable and without any negative consequences. If participants want to withdraw during the test, they do not need to submit their answer sheet and questionnaire, or they can quit the online test and questionnaire. Participants did not take any risks to attend every task in this research. Their names were replaced by the coding numbers after the data collection, and there is no identifying information in the thesis. Lastly, all the original data file is stored in a password-protected laptop to which only the researcher can access and will not be kept until the final thesis is submitted. The ethical details were stated clearly in a separate ethical review application form which was submitted to the Human Research Ethics Committee of the university and gained approval before the data collection.

3.3 Instruments

In general, there are two chief research instruments - Chinese character reading test and Chinese learning questionnaire. The test instructions and the questionnaire are in both Vietnamese and Chinese. Since I am a Vietnamese beginning learner, I recruited the professional translator to do such work. The Chinese texts were translated into Vietnamese by a professional Chinese-Vietnamese translator and proofread by another translator. I also sent the translation texts to a local Chinese teacher in Vietnam for further checking. Importantly,

the files were kept strictly confidential. The following two parts will present each research material in detail.

3.3.1 Chinese character reading test

The Chinese character reading test contains two sections – the single character reading task and the two-character word reading task. Firstly, given the difficulty of collecting face-to-face data during the Covid-19 epidemic, we developed an online platform through which we could access the instant data when the investigator conducted the Chinese character reading test with each participant. We designed, developed, tested, and modified the online test instrument from March to May 2021. There were two websites: one was the reading test platform for the participants, and another was the administrating platform for the investigator to grade the answer sheets. The reading test platform was developed for collecting the oral (pronunciation) and print (meaning) data on each test character. Anti copy and paste function was added. The bitrate of the audio recording is 128, and the sample rate is 16000, which means it can clearly record the participants' pronunciation. This platform is supported on the desktop, mobile phone, and tablet. Notably, three languages (Vietnamese, Chinese, and English) are provided for the participants to choose for reading the step-by-step instructions. Moreover, recent studies have provided evidence to support the online mode data collection method, which could reach a relatively high accuracy, reliability, and validity (Anwyl-Irvine et al., 2020). Many studies have conducted the online test to obtain instant data during the pandemic years (e.g., Lau et al., 2022).

In addition, there were 100 single Chinese characters (including the first four non-testing

characters used for participants to get familiar with the process) and 108 two-character words which were selected from the students' textbooks. The 208 items were all notional words (excluding the function words) because of their major quantity and straightforward meaning retrieving. Moreover, there are three reasons for incorporating the two-character word reading task. The participants learned the topic vocabulary in each lesson, through which they also learned Chinese characters. The second reason goes to the important relationship between Chinese characters and words. And disyllabic words account for a large proportion of modern Chinese. There were four main textbooks for the participants' Chinese course: *Tiyan hanyu: Shenghuo pian* [Experience Chinese: Living in China] (Zhu et al., 2007), *Tiyan hanyu: Shenghuo pian jinjie* [Experience Chinese: Living in China (advanced)] (Zhu & Chu, 2011), *Tiyan hanyu: Gongwu pian* [Experience Chinese: Official communication in China] (Chu et al., 2008), *Tiyan hanyu: Shangwu pian* [Business communication in China] (Zhang & Yue, 2008). Due to the complex configuration and orthographic units of Chinese characters, these single characters were divided into different groups based upon their structures, the graded level, the number of strokes, and the types of character formation. Moreover, the two-character words were divided into different groups according to the graded level and the number of topics that these words appeared in the students' Chinese textbooks (each unit represents a topic). Considerations about such classification are as follows.

Seeing that many studies have found the CSL/CFL learners could have different performances in learning the Chinese characters with different attributes, we divided the 96 test characters into subsets to examine the CHL and non-CHL participants' reading achievement.

First, based on the Chinese character configuration, we selected both single-component

characters (月/yuè/ [moon, month], 水/shuǐ/ [water], 门/mén/ [door]) and compound characters (e.g., 试/shì/ [test, try], 菜/cài/ [dish, vegetable], 座/zuò/ [seat]). Among the compound characters, three fundamental structures were considered: left-right, top-bottom, and half-surrounded/surrounded compounds. Although there are other structural types (such as left-middle-right, top-middle-bottom, etc.), the three fundamental structures constitute a large proportion of Chinese characters and are usually selected in previous studies (e.g., J. Zhang, 2016, 2017; Lu, 2002). Some Chinese characters, like "搬 (/bān/ [move])", it is a phonogram with the semantic radical "扌" on the left side and the phonetic component "般" on the right side despite it being of a left-middle-right structure. Such characters in this study were placed in the left-right structure group. Also, as there is a small proportion of the half-surrounded and surrounded characters in the textbooks, we grouped them together into the (half)surrounded structure subset.

Second, the test characters were divided into the elementary, intermediate, and advanced groups according to the graded level in *Chinese Proficiency Grading Standards for International Chinese Language Education* (2021). This classification reflects the familiarity of these Chinese characters with L2 learners. We checked the graded level of each selected Chinese character in the newest *Standards*, leaving 32 characters in each level group.

Third, the test characters were also divided into the fewer strokes group (stroke number < 9) and many strokes group (stroke number > 9). The cutting point is based on the "stroke-number effect" of Chinese characters (Jiang et al., 2020; Kuo et al., 2015; Xu, 2010, pp. 248-249; Zhang, 2017). Some scholars suggest that the CSL/CFL learners tend to have better achievement in learning the Chinese characters with less than nine strokes. To avoid the

ambiguity of the cutting stroke number, we deleted those Chinese characters of nine strokes.

Fourth, in light of the multifaceted features of Chinese characters, we considered the types of character formation as well. In general, we selected two types of character formation for the single-component characters – pictographs and self-explanatory characters, and two types of character formation for the compound characters – phonograms and associative compounds. Although there exist overlaps between the phonograms and associative compounds (such as "挚/zhì/ [sincere]" is a phonogram and also an associative compound), we only selected one formation method as there are a great number of phonograms in Chinese. But to avoid ambiguity, we tried not to choose such characters unless necessary.

Likewise, the 108 two-character words were allocated into different groups according to the graded level (elementary/intermediate/advanced Chinese vocabulary) in *Chinese Proficiency Grading Standards for International Chinese Language Education* (2021). Furthermore, as these two-character words were selected from the students' textbooks, we also considered the influence of their frequency and familiarity on the students' reading achievement due to the importance of the frequency and salience effect in L2 input (Ellis, 2002, 2006). The four Chinese textbooks are topic-oriented, so we calculated the number of topics in which each word appears as a measure to assess the word frequency and familiarity. Same as the three level groups, the 108 two-character words were allocated into the subsets of many topics (>=10), medium topics (<10), and a few topics (one or two) separately. The classification of the number of topics was decided by the proportionate distribution in view of the reduced topics in the higher-level words. Although the number of topics reduces typically with the increase of word level, namely the elementary words normally appear in many topics, some words are not in such a case. For example, "司机/sī jī/ [driver]" and "继续/jì xù/ [continue]"

are elementary vocabulary, but they only appear in one topic. “出差/chū chāi/ [go on an errand]” is an intermediate vocabulary appearing in many topics. Therefore, we selected the test words based on the graded level and topic quantity which are highly related to the class and textbook instruction.

Overall, apart from the four examples, there are 24 single-component characters (with four items in each level and formation type) and 72 compound characters (with two items in each structure, number of strokes, level, and formation type). As the two-character reading test followed the single character test, there were no example words, and the 108 targets were distributed in each level and the number of topics. The purpose of classifying the test characters is to examine a wide range of Chinese characters. It is hopeful to present a relatively comprehensive picture of the students’ achievement in learning to read Chinese characters. Table 4 shows the information and examples of the test characters. A full list of the Chinese characters and test answers are presented in Appendix A.

Table 4 The information and examples of the test Chinese characters

Reading test	Information & Examples				
Single character reading task (4+96)	Single-component characters (24)	elementary level (8): 月、雨、中 intermediate level (8): 尺、牙、末 advanced level (8): 舟、川、匆	pictographs (12): 门、雨、耳 self-explanatory characters (12): 下、本、叉		stroke number< 9
	Compound characters (72)	elementary level (24): 请、花、问 intermediate level (24): 冰、梦、返 advanced level (24): 删、雾、匠	phonograms (36): 住、慰、园 associative compounds (36): 族、梦、国	left-right (24): 订、好、镜 top-bottom (24): 毕、笑、卖 (half)surrounded (24): 趣、圆、闹	stroke number< 9 (36): 对、爸、迟 stroke number> 9 (36): 烤、挚、康
Two-character reading task (108)		elementary level (36): 星期、公园、喜欢、知道 intermediate level (36): 打折、兴趣、毕业、搬家 advanced level (36): 烤鸭、公寓、简历、化妆		many topics (36): 周末、电话、描述、朋友 medium topics (36): 衣服、邮件、度假、希望 few topics (36): 民族、告别、针灸、迷路	

Note. The number in the parentheses is the number of test characters.
One Chinese character bears many features, such as "好" is an elementary associative compound of left-right structure with a few strokes.

3.3.2 Chinese learning questionnaire

To answer the second and third research questions, we collected the participants’ background

information, their frequency of extracurricular Chinese activity engagement, L2 Chinese learning motivation under the L2MSS framework, and their views on formal Chinese character instruction via an online questionnaire (supported by wjx.cn). When participants complete the questionnaire, this platform automatically presents their answer sheets, completion time, submission tools (smartphone/computer/tablet), and IP address (Vietnam). No personal identifying data is provided. Such information can help us screen out those invalid questionnaires preliminarily.

The Chinese learning questionnaire was comprised of three mandatory parts: (1) the learners' background information (including the frequency of attending extracurricular Chinese activities), (2) L2 Chinese learning motivation scale, (3) and the open-ended questions on students' perceptions of Chinese character learning formal context. The questionnaire was in both Chinese and Vietnamese. The Chinese version was translated by a professional Chinese-Vietnamese translator and proofread by another translator. One local Chinese teacher in Vietnam also helped checked the Vietnamese version. The Chinese learning questionnaire is attached in Appendix B. The subsequent paragraphs will elaborate on more details.

(1) The first part contains: (a) Participants' demographic information, such as the name of the university, year of study, their name, email address, major, ethnic group, gender, age-range, Chinese classes, Chinese level, languages spoken at home, and family connections (whether they have Chinese family members or relatives). The required name and email address herein are used to match the participants' questionnaire with their Chinese character reading test sheets. Such information is kept strictly confidential and will be purged after the completion of data analysis. (b) Participants' prior Chinese learning experience, such as the amounts of Chinese classes they have had, the frequency of attending Chinese classes, the formal

Chinese instruction before entering the university, the age and length of studying Chinese, the approximate number of Chinese characters they have learned, and China visiting experience. The information collected in (a) and (b) is used to know the respective Chinese learning background of the CHL and non-CHL learners. (c) Participants' frequency of engaging in extracurricular Chinese activities, such as speaking Chinese with family or friends, watching Chinese TV programs, listening to Chinese songs, visiting the China town or Chinese market, reading Chinese books, and writing Chinese characters. These items are developed from the investigation of after-class Chinese activities in Cheng (2020) and the pilot study. Participants need to choose the frequency they attend these activities (1-never, 2-seldom, 3-sometimes, 4-often, 5-usually, 6-always). We adopted such a general description to scale the self-report frequency due to that the participants felt it inconvenient to calculate the specific hours of engaging in after-class Chinese activities.

(2) As most L2 motivation scales are designed for learning English as a second/foreign language learners, the second part adopts Lin's (2018) L2 Chinese Motivational Self System Scale as one reliable and valid measure to investigate the CHL and non-CHL learners' motivation in this study. In the doctoral dissertation, Lin (2018) examined the effect of Dörnyei's L2MSS model in learning Chinese Mandarin and compared seven motivational factors between adult CHL and non-CHL learners in the American context. This questionnaire was adapted from previous published L2 motivation questionnaires and added new items designed for assessing the CHL and CFL learners' instrumental orientation in relation to China and Mandarin. This newly designed scale incorporates the speciality of Mandarin and the development of China, which suits the current situation of the CHL and non-CHL learners overseas. Also, Lin's (2018) modified model fitted the data well and has good reliability and validity among a sample size of 229. Due to these considerations, the

present study adopted this scale as an important instrument to measure the Mandarin learning motivation of adult CHL and non-CHL learners in Vietnam.

Lin (2018) adopted a 6-point Likert scale comprised of 40 statements on the learners' ideal L2 self, ought-to L2 self, L2 learning experience, family influence, intended learning effort, instrumentality in promotion, and instrumentality in China and Mandarin (pp. 83-86). Specifically, in this questionnaire, the items 12, 19, 29, 31, 36, 39 are on the ideal L2 self, items 2, 6, 8, 9, 11, 15, 21 are on the ought-to L2 self, items 4, 13, 18, 20, 22, 30, 33 are on L2 learning experience, items 17, 23, 25, 27, 38 are on the family influence, items 7, 10, 26, 34, 37, 40 are on the intended effort, items 24, 28, 32, 35 are on China and Mandarin instrumentality, and items 1, 3, 5, 14, 16 are on the promotional instrumentality (pp. 87-88). Participants need to choose the number that best matches the extent that they agree or disagree with these 40 items (1=strongly disagree, 2, 3, 4, 5, 6=strongly agree). One advantage of the 6-point Likert scale lies in avoiding the selection of the middle category. We provided the Chinese and Vietnamese version of this L2MSS scale (see Appendix B).

(3) The writing words of survey responses or records are one important qualitative data to gain a diversity of the respondents' perspectives that can be achieved by convenience sampling (Barbour, 2008, p. 157). Considering that the researcher had limited Vietnamese proficiency and that it was inconvenient to conduct the interviews with the participants during the Covid-19 pandemic, we designed and tested the open-ended questions in the questionnaire to inquire about the individuals' perspectives. This design draws on the experience of the study of Shen and Xu (2015), in which they used the survey method to investigate 30 CSL learners' opinions on the Chinese vocabulary instruction in class.

The third part contains five open-ended questions on the students' perceptions of their Chinese character learning formal context, namely the class instruction and their textbooks, to which the participants need to write down their answers in either Vietnamese or Chinese. In order to reap more information, the participants were encouraged to provide more details and examples and try to type over 100 words for each question. These general questions target at inquiring the CHL and non-CHL learners' views on Chinese character instruction in their Chinese class and textbooks respectively, reflecting their L2 learning experience. The five open-ended questions were reduced and modified from the questionnaire in the pilot study and are listed below:

1. What do you think of the Chinese character teaching section in your class? Could you please specify with examples?

This question aims to gain a wide range of perspectives on class character instruction from both CHL and non-CHL learners at different Chinese proficiency levels. Students may answer from the teaching form and content of Chinese characters, their learning environment and atmosphere, the learning effectiveness and efficiency, etc.

2. What do you think of the way that your teacher teaches you the new Chinese characters and words? Could you please give some examples?

This question aims at knowing the students' evaluation of their teacher's Chinese character instruction in class. Students may provide views on the teacher's personality, teaching methods, how the teacher helps with their Chinese character learning, and so forth.

3. What is your favorite and least favorite Chinese character teaching content? And why?

Question 3 is a transitional question which connects the students' views on Chinese character

instruction in class and in textbooks. It aims to gain information about the CHL and non-CHL students' Chinese character learning experience from their favorite and least favorite aspects. Students may share their views on the characteristics of Chinese characters, the teaching form and content in the class and textbooks, some related coursework, etc.

4. What do you think of the Chinese character learning section in your textbooks? Could you please specify with examples?

This question aims at collecting a wide range of perspectives on textbook character instruction from the CHL and non-CHL learners at different Chinese proficiency levels. Students may give answers from the form and content of Chinese character instruction in their textbooks, the organization and illustrations of Chinese characters and words, the practicability and attraction of their textbooks, and so on.

5. In terms of learning Chinese characters and words, how do you evaluate the textbooks and workbooks? Are they helpful to your Chinese character and word learning?

This question aims to obtain the students' evaluation of the Chinese character and vocabulary sections in their textbooks and workbooks. Students may share their views on the practicability of the Chinese characters and words presented in the textbooks, the effectiveness of the exercises, how these learning materials help with their Chinese character learning, etc.

3.4 Pilot study

I conducted a pilot study in early May 2021. The ethical approval letter was received on 3rd May from the Human Research Ethics Committee of the university. After gaining the informed consent of a local Chinese teacher and her students, I invited two Hoa students and two Kinh students of advanced Chinese proficiency level to participate in the pilot study.

They first completed the Chinese learning questionnaire and then attended the Chinese character reading test online. After the test, I received their feedback about the questionnaire and the two reading tasks. One major problem was that there were 10 open-ended questions at the end of the online questionnaire. The four students and their Chinese teacher thought that the questions were too many to be answered in detail, and many students would be reluctant to complete it. Therefore, I reduced the ten open-ended questions into five questions mainly focusing on students' perceptions of learning Chinese characters in class and textbooks, which are the formal learning opportunities in the conceptual framework of this study. Furthermore, in the pilot study, there were 30 Chinese characters and words in the Chinese character reading test, and each character or word was finished within 15s. Ten seconds for each item seemed a bit short, as they had to type the Vietnamese meaning after reading that character or word. Hence, I set the assigned time for each reading item to 15s in the formal test. Since there are 208 reading items in the formal test, there should be a short break after the single Chinese character reading task.

The preliminary results of the pilot study suggest that there seemed to be some differences in the Chinese character reading achievement, L2 Chinese learning motivation, and the frequency to attend extracurricular Chinese activities between the Hoa and Kinh students. However, there was no statistical analysis because of the extremely small samples. It then led us to the formal data collection procedures.

3.5 Procedures

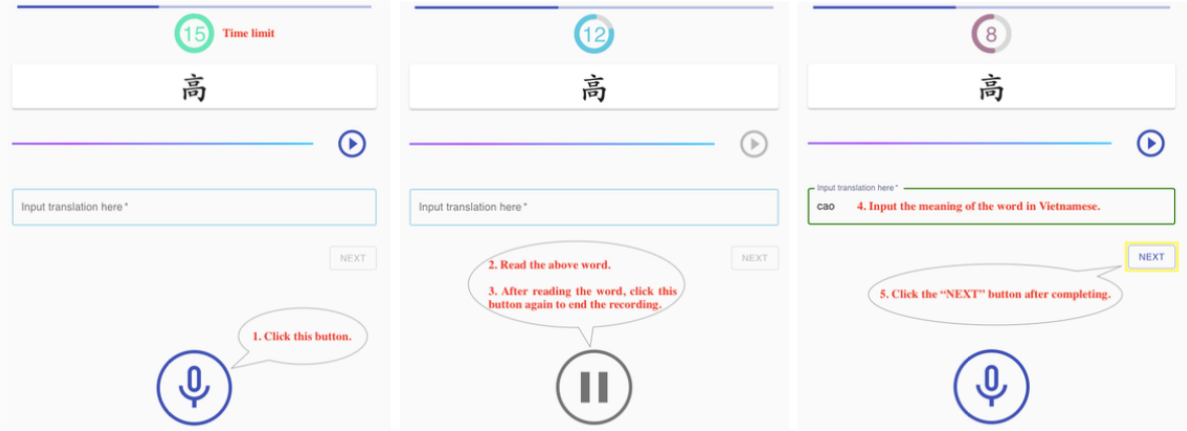
The data was collected from mid-May to the end of September 2021. And the data collection started with the advanced Chinese learners, next with the intermediate Chinese learners, and finally with the elementary Chinese learners, in case that the participants' Chinese level may upgrade during the data collection period.

First, the informed consent from each participant and their Chinese instructor was secured before any data collection. Also, a pilot study was conducted with several volunteers before the formal test. The participants were invited to complete the learners' background information and L2 Chinese learning motivation questionnaire, and then participated in the Chinese character recognition test. The Chinese character and word reading test was conducted with each participant through the online platform. The participants first completed the single character reading task, and had a short break, and then took the word reading task. It took them around 20 minutes to fill in the questionnaire and 40-50 minutes to finish the Chinese character reading test.

In the Chinese character reading test, with the guidance of the students' Chinese teacher, each participant logged into the test platform and typed their personal information, and then read the instructions. There are three languages for the instructions: Vietnamese, Chinese, and English. When clicking the "Agree and Proceed" button, they entered the test page. Each Chinese character or word is appearing automatically on the screen one by one, lasting for 15

seconds, during which the participants need to click the record button and read out that character or word, and then type the Vietnamese meaning in the box. If they finish ahead of time or if they do not know the word, they can click the "Next" button to access the next word. If they do not finish within 15s, the system will automatically turn to the next word. The process is illustrated in Figure 3 below (also see Appendix A).

Figure 3 The process of the Chinese character reading test



Different from many prior studies only examining learners' character pronunciation, the character meaning is included in my study because recognizing a Chinese character refers to knowing its pronunciation and meaning when looking at its form. As introduced previously, there are a large number of phonograms and homophonic characters in Chinese, so that we could not know the real situation of students' mastery of that Chinese character if we only examine their pronunciation. Moreover, it is hard to find a unified marking criterion as the L2 Chinese learners' pronunciation varies from person to person. In view of the Chinese character reading model, it is suggested the interactive relationship among the characters' orthography, pronunciation, and meaning (Dang et al., 2019; Perfetti et al., 2005; Reichle & Yu, 2018). Therefore, the participants are required to read out each Chinese character and

type the Vietnamese meaning on the online testing platform.

3.6 Data coding and analysis

In the Chinese character reading test, each correct answer (including both the correct pronunciation and meaning) was given one point. For example, if a participant got the correct pronunciation /zuò/ but provided the wrong meaning [sit] when reading the Chinese character "座/zuò/ [seat]" ("坐[sit]" and "座[seat]" have the same pronunciation /zuò/ but different meanings), then there will be zero point for this character. This marking criterion was adopted to avoid the interference of the regular phonograms. Similarly, if a participant typed the correct meaning under the hint of the semantic clues but provided another pronunciation, there will be zero point for this character. Moreover, the participants could gain one point when they read the two characters correctly in the word reading task. For example, if a participant got the correct pronunciation and meaning for one character "大 (/dà/ [big])" but made mistakes for another character "厦 (/shà/ [a tall building])" in the word "大厦", then there will be zero point for this word. Also, if a participant got the correct pronunciation but provided the wrong meaning when reading the word "打包/dǎ bāo/ [pack]", then there will be zero point for this word. Likewise, if a participant typed the correct meaning but made a mistake in pronunciation, there will be zero point for this word, either. The participants' pronunciation may not be standard but cannot cause misunderstanding. The Vietnamese translation is correct as long as it corresponds to any meaning of that Chinese character or word.

After receiving all answer sheets, the investigator graded each paper twice and checked the scores of each participant. The scores were then imported into SPSS27.0 for statistical analysis. The participants' Chinese character reading achievement can be seen as the total score in this test and the accuracy gained separately in each type of Chinese characters. The final scores are divided into the CHL and non-CHL groups based on their background information. To answer the first research question about the developmental differences and commonalities, I conducted ANOVAs to compare the scores in the two Chinese character reading tasks of the CHL and non-CHL learners at the elementary, intermediate and advanced Chinese level. Also, the ANOVAs were used to compare the accuracy of each type of Chinese characters and words among the CHL and non-CHL learners at different Chinese levels.

Secondly, the score of each participant's frequency to attend these activities was recorded as the average number they received (1-never, 2-seldom, 3-sometimes, 4-often, 5-usually, 6-always). Likewise, the score of each participant's L2 Chinese learning motivation was recorded as the average number they received (1=strongly disagree, 2, 3, 4, 5, 6=strongly agree). In order to know the differences and commonalities in L2 Chinese learning motivation and the frequency of attending extracurricular Chinese activities, I conducted two ANOVAs to compare the motivation scores and the frequency scores between the CHL and non-CHL groups respectively. Furthermore, to answer the second research question, the Pearson correlation tests were conducted to examine the relationships between the participants' Chinese character reading scores, their L2 Chinese learning motivation scores, and their frequency scores of attending extracurricular Chinese activities, as well as the correlations between the character reading scores and each sub-item in the motivation and frequency scales. Additionally, we further conducted the multiple regression analysis to examine the relationships among the Chinese character reading achievement, L2 Chinese

learning motivation, and the frequency of extracurricular Chinese engagement when there were significant correlations between them.

Thirdly, in order to answer the third research question, I analyzed the qualitative data in NVivo 12.7.0 to find the main differences and commonalities in the CHL and non-CHL learners' views about the Chinese character instruction in class and textbooks. The data treatment and coding are articulated as follows.

After receiving the participants' completed questionnaires, I first removed those simple answers (such as "good", "useful", "helpful", "boring", "like/dislike", etc.) or unrelated answers (such as Chinese grammar, communication skills, etc.) to each of the open-ended questions because such answers cannot provide valid information for our understanding of how the formal instruction facilitate their Chinese character learning. Therefore, there remained 35 (in the CHL group) and 48 (in the non-CHL group) valid answers to Question 1, 43 (CHL) and 42 (non-CHL) valid answers to Question 2, 34 (CHL) and 33 (non-CHL) valid answers to Question 3, 33 (CHL) and 31 (non-CHL) valid answers to Question 4, and 30 (CHL) and 29 (non-CHL) valid answers to Question 5. The valid answers were reduced gradually as the participants in both groups felt exhausted from typing many words question by question.

Next, as many answers were written in Vietnamese and some in Chinese, the Vietnamese answers to the five open-ended questions were translated into Chinese by a professional Vietnamese-Chinese translator and proofread by another translator. I also sent the translation texts to a local Chinese teacher in Vietnam for further checking. Importantly, there were no identifying information about the participants, and the files were kept strictly confidential.

After that, the survey answers of the CHL and non-CHL participants were imported to the data coding and analyzing software. The software analysis can help us tag and retrieve the data more efficiently (Basit, 2003). Since the qualitative data in real life is too intricate to perfectly fit into the theoretical framework (Barbour, 2008, p. 234), thus the "concept-driven" and "data-driven" coding (Gibbs, 2007, pp. 44-46) were implemented in this study. I iteratively coded each text and grouped them into a node under the core themes that appeared in the students' answers. Also, the answers were coded by a research assistant. The final themes were decided by synthesizing the same or similar coding from our independent work. After the first round of assigning the primary themes, I further hierarchically analyzed the text as "parent" and "children" codes by looking for the relationships among the initial themes. According to Gibbs (2007, p. 77), these codes were then reduced into "more analytic and theoretical ones" when I carefully examined the similar themes and patterns. After that, under the guidance of Miles et al. (2020, pp. 105-109), I drew on the matrix to do the comparisons between the CHL group and non-CHL group, attempting to find the similarities and differences in their perceptions of the Chinese character instruction in class and textbooks and the influence of such views on Chinese character reading achievement. In the end, I made a table to present the core findings.

3.7 Reliability and validity

In the quantitative test, the "reliability" refers to that we use the research instruments and procedures to achieve the consistent results in our sample with different circumstances

(Dörnyei, 2007, p. 50). To make sure the reliability of the L2 Chinese learning motivation and the frequency of attending extracurricular Chinese activities in the questionnaire, their internal consistency was tested respectively, and the Cronbach alpha coefficients are provided in the result chapter. Additionally, the "validity" in quantitative research refers to that the instruments and procedures are adequate to combat those "unexpected problems" and "uncontrolled factors" that can significantly affect our results, and the research findings can be generalized to a large population (Dörnyei, 2007, pp. 52-53). The internal validity in this study is expected to be achieved by adopting those commonly and successfully used tests and scales in previous studies, and carefully selecting and evaluating the test characters (i.e., checking the information of each Chinese character in the dictionary), as well as reporting the authentic statistical results.

In the qualitative data analysis, researchers mainly discuss the validity of the study. It refers to the trustworthiness of the research description, the interpretation, explanation and the conclusion of the study (Maxwell, 2013, p. 138). In this study, my researcher bias could be one major validity threat. In other words, I may take the risk to select the data from the participants' written answers that satisfy the existing theory or my assumptions but ignore the whole authentic story. To avoid such researcher bias, I used some strategies to enhance the validity of the results and the research quality. For example, the Vietnamese-Chinese translation texts were proofread by another professional translator and a local Chinese teacher in Vietnam. Also, I coded the participants' answers iteratively and invited a research assistant to help with the data coding and compared it with mine. Moreover, I explicitly express my researcher bias and allow for any negative or discrepant perspectives from the participants, and provide the "clear, coherent and thick descriptions" for readers to perceive the "verisimilitude" of their views (Miles et al., 2020, pp. 306-307).

In sum, I explicitly report the authentic results and findings from the Chinese character reading test and the Chinese learning questionnaire, and clearly express my researcher identity in the thesis.

3.8 Chapter summary

This chapter introduces the quantitative and qualitative research methods in six sections: participants and settings, research instruments, pilot study, procedures, data coding and analysis, reliability and validity.

In summary, (1) there were 181 Vietnamese participants (89 CHL and 92 non-CHL learners) completing the Chinese learning questionnaire and attending the whole Chinese character reading test. Because of the Covid-19 pandemic, all data was collected on the internet. We have developed a website to conduct the Chinese character reading test with each participant. (2) There are two chief research instruments: an online Chinese character reading test (including "4+96" single characters and 108 two-character words) and an online Chinese learning questionnaire (consisting of the learners' background information, the frequency of attending extracurricular Chinese activities, L2 Chinese learning motivation scale, and five open-ended questions). Moreover, the single characters are classified into different groups based on their structures, the graded level, the number of strokes, and the types of character formation, while the two-character words are divided into different groups according to the graded level and the number of topics that these words appeared in students' Chinese

textbooks. The participants' L2 Chinese learning motivation was examined by Lin's (2018) L2 Chinese Motivational Self System Scale. (3) The pilot study was conducted with two Hoa students and two Kinh students of advanced Chinese proficiency level at a Vietnamese university, and they provided their feedback and suggestions which led to the revisions in the formal data collection. Also, I received some preliminary results. (4) The research procedures: After gaining the informed consent of the participants and their Chinese instructor, the participants were invited to complete the Chinese learning questionnaire and then took the Chinese character recognition test (single character reading task→break→two-character reading task). (5) Data coding and analysis: In the Chinese character reading test, the motivation and frequency scales, the scores were given to each participant. The quantitative data was analyzed in SPSS 27.0. Among the answers to the open-ended questions, I used the theme coding and analyzed the data with the help of NVivo 12. (6) Finally, the reliability and validity of the quantitative and qualitative research were discussed respectively.

Chapter 4: Results and Findings

4.1 Chapter introduction

This chapter will first illustrate the result of the Chinese character reading test, the result of L2 Chinese learning motivation and the frequency of attending extracurricular Chinese activities, and the relationships among the three variables, in the CHL and non-CHL groups. Furthermore, this chapter will demonstrate the findings from the CHL and non-CHL learners' views on the Chinese character instruction in their class and textbooks, with the main themes and supporting examples. It will end up with a summary of the major quantitative results and qualitative findings.

4.2 Results of the Chinese character reading test

In the Chinese character reading test, each correct answer was given one point and zero points for the wrong answer. The full mark for the single character and two-character word reading task is 96 and 108 respectively, and the total score of Chinese character reading test is 204. The data was analyzed in SPSS27.0. The reliability of the CHL group's single-character and two-character reading test were 0.97 and 0.98 respectively, and the reliability were 0.96 and 0.97 for the non-CHL group.

Firstly, the descriptive statistics of the single character reading score, two-character word

reading score, and the total scores are presented in Table 5 below. For the CHL group: (a) the mean score of the single character reading task was 21.17 (elementary), 50.37 (intermediate), and 70.57 (advanced) separately, (b) the mean score of the two-character word reading task was 24.34 (elementary), 64.83 (intermediate), and 83.10 (advanced) separately, (c) the mean total score was 45.52 (elementary), 115.20 (intermediate), and 153.67 (advanced) separately. For the non-CHL group: (a) the mean score of the single character reading task was 19.84 (elementary), 38.97 (intermediate), and 57.63 (advanced) separately, (b) the mean score of the two-character word reading task was 24.87 (elementary), 49.74 (intermediate), and 73.77 (advanced) separately, (c) the mean total score is 44.71 (elementary), 88.71 (intermediate), and 131.40 (advanced) separately.

Table 5 Descriptive statistics of the Chinese character reading test result

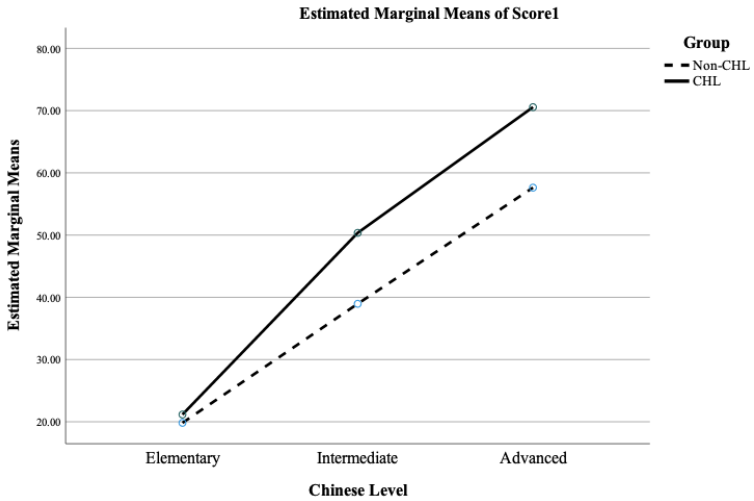
Dependent Variable		Score1	Score2	Total Score	
Group	Chinese Level	Mean (SD)	Mean (SD)	Mean (SD)	N
CHL	Elementary	21.17 (6.39)	24.34 (10.79)	45.52 (15.01)	29
	Intermediate	50.37 (11.33)	64.83 (18.66)	115.20 (28.11)	30
	Advanced	70.57 (9.52)	83.10 (14.84)	153.67 (21.00)	30
	Total	47.66 (22.31)	57.80 (28.78)	105.46 (49.86)	89
Non-CHL	Elementary	19.84 (8.59)	24.87 (12.34)	44.71 (20.04)	31
	Intermediate	38.97 (7.45)	49.74 (12.22)	88.71 (14.42)	31
	Advanced	57.63 (9.15)	73.77 (14.93)	131.40 (20.11)	30
	Total	38.61 (17.57)	49.20 (23.90)	87.80 (39.87)	92

Note. Score1= the score of the single character reading task. Score2= the score of the two-character word reading task. Total Score= the total score of the two reading tasks. N= the number of participants. The number in the bracket is the standard deviation.

Secondly, we used ANOVAs to compare the test results of the CHL and non-CHL groups at the elementary, intermediate, and advanced Chinese level. In the single character reading test, there was a significant effect of Group, F (1, 175) = 41.96, p< .001, η^2= .19, and a significant

effect of Chinese Level, F (2, 175) = 362.55, p< .001, η^2= .81. Also, there was a significantly interactive effect of Group and Chinese Level, F (2, 175) = 7.56, p< .01, η^2= .08. The simple effect analysis showed that at the elementary Chinese level, the CHL and non-CHL groups had no differences, F (1, 175) = .34, p= .56, η^2= .002; at the intermediate Chinese level, the CHL group had significantly higher scores than the non-CHL group, F (1, 175) = 25.11, p< .001, η^2= .13; at the advanced Chinese level, the CHL group also had significantly higher scores than the non-CHL group, F (1, 175) = 31.80, p< .001, η^2= .15. Moreover, for both groups, the score of the students at advanced Chinese level was significantly higher than those at intermediate level, and the score of the learners at intermediate level was significantly higher than those at elementary level, F (2, 175) = 138.06, p< .001, η^2= .61 (non-CHL), F (2, 175) = 230.10, p< .001, η^2= .72 (CHL). The comparison can be seen in Figure 4 below.

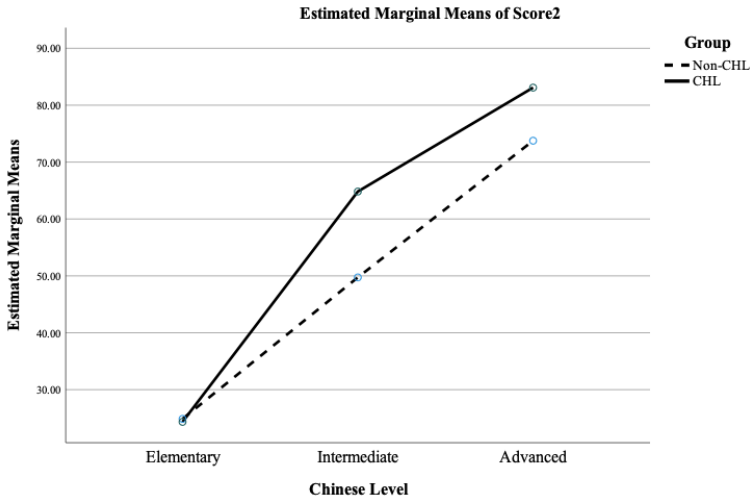
Figure 4 The result of the single character reading test



In the word reading test, there was a significant effect of Group, F (1, 175) = 14.24, p< .001, η^2= .08, and a significant effect of Chinese Level, F (2, 175) = 218.85, p< .001, η^2= .71. Also, there was a significantly interactive effect of Group and Chinese Level, F (2, 175) = 4.67,

$p < .05$, $\eta^2 = .05$. The simple effect analysis showed that at the elementary Chinese level, the two groups had no differences either, F (1, 175) = .02, $p = .89$, $\eta^2 = .00$; at the intermediate and advanced Chinese level, the CHL group had significant higher scores than the non-CHL group, F (1, 175) = 17.23, $p < .001$, $\eta^2 = .09$ (intermediate), F (1, 175) = 6.48, $p < .05$, $\eta^2 = .04$ (advanced). Moreover, for the two groups, the score of the students at advanced Chinese level was significantly higher than those at intermediate level, and the score of the learners at intermediate level is higher than those at elementary level, F (2, 175) = 90.47, $p < .001$, $\eta^2 = .51$ (non-CHL), F (2, 175) = 131.86, $p < .001$, $\eta^2 = .60$ (CHL). The comparison chart can be seen in Figure 5 below.

Figure 5 The result of the two-character word reading test



In addition, the paired samples t-test was conducted to compare the accuracy of the single character reading task and the word reading task among the two groups. The results demonstrated, that for the CHL participants, the mean accuracy of the single character test was 49.65% (SD= .23), the mean accuracy of the word test was 53.52% (SD= .27), t (88) = 3.18, $p < .01$, Cohen's d= .34; for the non-CHL participants, the mean accuracy of the single character test was 40.22% (SD= .18), the mean accuracy of the word test was 45.55%

(SD= .22), t (91) = 4.32, p< .001, Cohen's d= .45. This illustrates that the two-character word reading accuracy was significantly higher than the single character reading accuracy among the two groups.

Thirdly, we conducted ANOVAs to compare the test results of the different types of Chinese characters and words.

(1) For the CHL group at the elementary Chinese level: (a) Among the single-component Chinese characters, there was a significant effect of the Level, F (2, 18) = 27.48, p< .001, η^2= .75, which showed that the accuracy of the elementary characters was significantly higher than the accuracy of the intermediate and advanced characters (p< .001), but there was no difference between the accuracy of the intermediate and advanced characters (p= .44). There was no significant effect of the Type, F (1, 18) = 2.33, p= .14, η^2= .12, and no interactive effect of the Level and Type, F (2, 18) = 1.03, p= .38, η^2= .10. The result suggests that the accuracy of the pictographs was the same as the self-explanatory characters for the elementary CHL learners. (b) Among the compound Chinese characters, there was a significant effect of the Structure, F (2, 63) = 4.30, p< .05, η^2= .12, which showed that the accuracy of the top-down structured characters is significantly higher than that of the (half)surrounded characters (p< .01), but there was no difference between the accuracy of the left-right and top-down structured characters (p= .13) and no difference between the accuracy of the left-right and (half)surrounded characters (p= .17). There was a significant effect of the Level, F (2, 63) = 64.94, p< .001, η^2= .67, which showed that the accuracy of the elementary characters was significantly higher than the accuracy of the intermediate and advanced characters (p< .001), but there was no difference between the accuracy of the intermediate and advanced characters (p= .07). There was a significant effect of the Number of Strokes, F

(1, 63) = 10.30, $p < .01$, $\eta^2 = .14$, and the accuracy of the characters with fewer strokes was significantly higher than that of the characters with many strokes. There was no significant effect of the Type, F (1, 63) = .32, $p = .58$, $\eta^2 = .01$, which suggested that the accuracy of the associative compounds was not different from the phonograms, and both had low accuracies. Besides, there was a significantly interactive effect of the Level and Number of Strokes, F (2, 63) = 7.61, $p < .01$, $\eta^2 = .20$. The simple effect analysis showed that the accuracy of the elementary compound characters with fewer strokes was significantly higher than the elementary compounds with many strokes ($p < .001$), but the Number of Strokes had no significant effects in the intermediate and advanced compound characters ($p = .59$ & $p = 1.00$ respectively) as their accuracy was marginal. (c) Among the two-character words, there was a significant effect of the Level, F (2, 99) = 37.05, $p < .001$, $\eta^2 = .43$, which showed that the accuracy of the elementary words was significantly higher than the accuracy of the intermediate and advanced words ($p < .001$), but there was no difference between the accuracy of the intermediate and advanced words ($p = .12$). There was a significant effect of the Number of Topics, F (2, 99) = 25.55, $p < .001$, $\eta^2 = .34$, which suggested that the accuracy of the words of many topics was significantly higher than that of the words of medium topics ($p < .01$), and the accuracy of the words of medium topics was significantly higher than the words of few topics ($p < .001$). Also, there was a significantly interactive effect of the Level and Number of Topics, F (4, 99) = 8.95, $p < .001$, $\eta^2 = .27$. The simple effect analysis illustrated that the accuracy of the elementary words with many topics was significantly higher than that of the elementary words with medium and few topics ($p < .001$), and the accuracy of the intermediate words with many and medium topics was significantly higher than that of the intermediate words with a few topics ($p < .05$), but the Number of Topics had no significant effect in the advanced words ($p = .55$, $p = .19$, $p = .47$) as their accuracy was very low.

(2) For the elementary non-CHL group: (a) Among the single-component Chinese characters, there was a significant effect of the Level, F (2, 18) = 55.30, p< .001, η^2= .86, which showed that the accuracy of the elementary characters was significantly higher than that of the intermediate and advanced characters (p< .001), but there was no difference between the accuracy of the intermediate and advanced characters (p= .50). There was a significant effect of the Type, F (1, 18) = 5.20, p< .05, η^2= .22. The accuracy of the pictographs was significantly higher than the accuracy of the self-explanatory characters (p< .05). There was no interactive effect of the Level and Type, F (2, 18) = 1.30, p= .30, η^2= .13. (b) Among the compound Chinese characters, there was no significant effect of the Structure, F (2, 58) = 2.62, p= .08, η^2= .08. The result suggested that there were no differences between the accuracy of the left-right and top-down structured characters (p= .40) and no differences between the accuracy of the left-right and (half)surrounded characters (p= .16), but the accuracy of the top-down structured characters was significantly higher than the (half)surrounded characters (p< .05). There was a significant effect of the Level, F (2, 58) = 92.32, p< .001, η^2= .76, which showed that the accuracy of the elementary characters was significantly higher than the accuracy of the intermediate and advanced characters (p< .001), but there was no difference between the accuracy of the intermediate and advanced characters (p= .13). There was a significant effect of the Number of Strokes, F (1, 58) = 14.10, p< .001, η^2= .20. The accuracy of the characters with fewer strokes was significantly higher than the characters with many strokes. There was no significant effect of the Type, F (1, 58) = .48, p= .49, η^2= .01, which suggested that the accuracy of the associative compounds was not different from the phonograms, and both had low accuracies. Additionally, there was a significantly interactive effect of the Level and Number of Strokes, F (2, 58) = 11.92, p< .001, η^2= .29. The simple effect analysis demonstrated that the accuracy of the elementary

compound characters with fewer strokes was significantly higher than the accuracy of the elementary compounds with many strokes ($p < .001$), but the Number of Strokes had no effects in the intermediate and advanced compound characters ($p = .84$ & $p = .88$ respectively) as their accuracy was minimal. (c) Among the two-character words, there was a significant effect of the Level, F (2, 99) = 50.18, $p < .001$, $\eta^2 = .50$. The result suggested that the accuracy of the elementary words was significantly higher than the intermediate words ($p < .001$), and the accuracy of the intermediate words was significantly higher than the advanced words ($p < .05$). There was a significant effect of the Number of Topics, F (2, 99) = 29.30, $p < .001$, $\eta^2 = .37$, which showed that the accuracy of the words of many topics was significantly higher than the words of medium topics ($p < .01$), and the accuracy of the words of medium topics was significantly higher than the words of few topics ($p < .001$). Moreover, there was a significantly interactive effect of the Level and Number of Topics, F (4, 99) = 9.01, $p < .001$, $\eta^2 = .27$. The simple effect analysis illustrated that the accuracy of the elementary words with many topics was significantly higher than the elementary words with medium and few topics ($p < .001$), and the accuracy of the intermediate words with many and medium topics was significantly higher than the accuracy of the intermediate words with few topics ($p < .05$), but the Number of Topics had no significant effects in the advanced words ($p = .17$, $p = .06$, $p = .59$) as their accuracy was very low.

(3) For the CHL group at the intermediate Chinese level: (a) Among the single-component Chinese characters, there was a significant effect of the Level, F (2, 18) = 50.64, $p < .001$, $\eta^2 = .85$, which showed that the accuracy of the elementary characters was significantly higher than that of the intermediate characters ($p < .001$), and the accuracy of the intermediate characters was significantly higher than that of the advanced characters ($p < .001$). There was a significant effect of the Type, F (1, 18) = 4.83, $p < .05$, $\eta^2 = .21$. The accuracy of the

pictographs was significantly higher than the accuracy of the self-explanatory characters ($p < .05$). There was no interactive effect of the Level and Type, F (2, 18) = 1.39, $p = .28$, $\eta^2 = .13$. (b) Among the compound Chinese characters, there was no significant effect of the Structure, F (2, 63) = 1.18, $p = .32$, $\eta^2 = .04$, which suggested that there were no differences among the accuracy of the left-right, top-down, and (half)surrounded characters for the intermediate CHL learners. There was a significant effect of the Level, F (2, 63) = 103.41, $p < .001$, $\eta^2 = .77$. The result tells that the accuracy of the elementary characters was significantly higher than that of the intermediate characters, and the accuracy of the intermediate characters was significantly higher than that of the advanced characters. There was no effect of the Number of Strokes, F (1, 63) = 1.85, $p = .18$, $\eta^2 = .03$, which demonstrated that the accuracy of the characters with fewer strokes was not different from the accuracy of the characters with many strokes. There was a significant effect of the Type, F (1, 63) = 14.92, $p < .001$, $\eta^2 = .19$, which suggested that the accuracy of the phonograms was significantly higher than the accuracy of associative compounds. Moreover, there was a significantly interactive effect of the Level and Type, F (2, 63) = 3.99, $p < .05$, $\eta^2 = .11$. The simple effect analysis indicated that the accuracy of the phonograms was significantly higher than the accuracy of the associative compounds among the intermediate and advanced Chinese characters ($p < .05$ & $p < .001$ respectively), but the Type had no effect in the elementary Chinese characters ($p = .85$). (c) Among the two-character words, there was a significant effect of the Level, F (2, 99) = 54.16, $p < .001$, $\eta^2 = .52$, which showed that the accuracy of the elementary words was significantly higher than that of the intermediate words ($p < .001$), and the accuracy of the intermediate words was significantly higher than the advanced words ($p < .01$). There was a significant effect of the Number of Topics, F (2, 99) = 39.20, $p < .001$, $\eta^2 = .44$, which suggested that the accuracy of the words of many topics was significantly higher than the accuracy of the words of medium topics ($p < .05$), and the

accuracy of the words of medium topics was significantly higher than the words of few topics (p< .001). There was no interactive effect of the Level and Number of Topics, F (4, 99) = .28, p= .89, η^2= .01.

(4) For the intermediate non-CHL group: (a) Among the single-component Chinese characters, there was a significant effect of the Level, F (2, 18) = 25.16, p< .001, η^2= .74, which showed that the accuracy of the elementary characters was significantly higher than the intermediate characters (p< .001), and the accuracy of the intermediate characters was significantly higher than the advanced characters (p< .05). There was no significant effect of the Type, F (1, 18) = 1.97, p= .18, η^2= .10. The accuracy of the pictographs was not different from the accuracy of the self-explanatory characters. And there was no interactive effect of the Level and Type, F (2, 18) = .58, p= .57, η^2= .06. (b) Among the compound Chinese characters, there was no significant effect of the Structure, F (2, 63) = .90, p= .41, η^2= .03, which suggested that there were no differences among the accuracy of the left-right, top-down, and (half)surrounded characters for the intermediate non-CHL learners. There was a significant effect of the Level, F (2, 63) = 91.75, p< .001, η^2= .74. The result indicated that the accuracy of the elementary characters was significantly higher than the intermediate characters (p< .001), and the accuracy of the intermediate characters was significantly higher than the advanced characters (p< .001). There was a significant effect of the Number of Strokes, F (1, 63) = 7.24, p< .01, η^2= .10, which demonstrated that the accuracy of the characters with fewer strokes was significantly higher than the accuracy of the characters with many strokes. There was a significant effect of the Type, F (1, 63) = 4.12, p< .05, η^2= .06, which showed that the accuracy of the phonograms is significantly higher than the accuracy of associative compounds. Additionally, there was no interactive effect of the Level and Type, F (2, 63) = 2.31, p= .11, η^2= .07. (c) Among the two-character words, there was a

significant effect of the Level, F (2, 99) = 38.44, p< .001, η^2= .44. The result showed that the accuracy of the elementary words was significantly higher than the accuracy of the intermediate words (p< .001), and the accuracy of the intermediate words was significantly higher than the advanced words (p< .05). There was a significant effect of the Number of Topics, F (2, 99) = 45.53, p< .001, η^2= .48, which suggested that the accuracy of the words of many topics was significantly higher than the accuracy of the words of medium topics (p< .05), and the accuracy of the words of medium topics was significantly higher than the words of few topics (p< .001). Moreover, there was a marginally significant interactive effect of the Level and Number of Topics, F (4, 99) = 2.20, p= .074, η^2= .08. The simple effect analysis revealed that the Number of Topics had a significant effect in the elementary words (p< .001), but among the intermediate and advanced words, the accuracy of the two-character words of many topics was not different from the words of medium topics (p= .87 & p= .11 respectively). The accuracy of the two-character words of medium topics was significantly higher than the words of few topics among the intermediate and advanced words (p< .001 & p< .05 respectively).

(5) For the CHL group at the advanced Chinese level: (a) Among the single-component Chinese characters, there was a significant effect of the Level, F (2, 18) = 7.41, p< .01, η^2= .45, which showed that the accuracy of the elementary characters was significantly higher than the intermediate characters (p< .05) and the advanced characters (p< .01), but the accuracy of the intermediate characters was not different from the advanced characters (p= .12). There was no significant effect of the Type, F (1, 18) = .60, p= .45, η^2= .03. The accuracy of the pictographs was the same as the accuracy of the self-explanatory characters. And there was no interactive effect of the Level and Type, F (2, 18) = .84, p= .45, η^2= .09. (b) Among the compound Chinese characters, there was no significant effect of the Structure, F

(2, 56) = .74, p= .48, η^2= .03, which suggested that there were no differences among the accuracy of the left-right, top-down, and (half)surrounded characters for the advanced CHL learners. There was a significant effect of the Level, F (2, 56) = 36.02, p< .001, η^2= .56. The result demonstrated that the accuracy of the elementary characters was significantly higher than that of the intermediate characters (p< .05), and the accuracy of the intermediate characters was significantly higher than the advanced characters (p< .001). There was no effect of the Number of Strokes, F (1, 56) = .21, p= .65, η^2= .004, which revealed that the accuracy of the characters with fewer strokes was not different from the accuracy of the characters with many strokes. There was a significant effect of the Type, F (1, 56) = 11.48, p< .01, η^2= .17, which suggested that the accuracy of the phonograms was significantly higher than the accuracy of associative compounds. Moreover, there was a significantly interactive effect of the Structure and Number of Strokes, F (2, 56) = 4.15, p< .05, η^2= .13. The simple effect analysis indicated that the accuracy of the left-right structured characters was significantly higher than the top-down structured characters (p< .05) and the accuracy of the top-down structured characters was significantly higher than the (half)surrounded characters (p< .05) among the Chinese characters with fewer strokes, but the Structure had no effect in the compound characters with many strokes (p= .28). There was a significantly interactive effect of the Number of Strokes and Type, F (1, 56) = 6.70, p< .05, η^2= .11. The simple effect analysis suggested that the accuracy of the phonograms was significantly higher than the accuracy of associative compounds (p< .001) among the Chinese characters with many strokes, but the Type had no effect in the Chinese characters with fewer strokes (p= .57). Also, there was a significantly interactive effect of the Level, Number of Strokes, and Type, F (6, 56) = 2.97, p< .05, η^2= .24. The simple effect analysis indicated that the Number of Strokes had significant effects in the advanced phonograms (p< .05) and associative compounds (p< .01) but had no effects among the elementary (p= .85 & p= .12)

and intermediate (p= .90 & p= .48) phonograms and associative compounds. (c) Among the two-character words, there was a significant effect of the Level, F (2, 99) = 20.67, p< .001, η^2= .30. The result showed that the accuracy of the elementary words was significantly higher than that of the intermediate words (p< .001), and the accuracy of the intermediate words was significantly higher than the advanced words (p< .05). Also, there was a significant effect of the Number of Topics, F (2, 99) = 24.35, p< .001, η^2= .33, which illustrated that the accuracy of the words of many topics was significantly higher than the accuracy of the words of medium topics (p< .05), and the accuracy of the words of medium topics was significantly higher than the words of few topics (p< .001). There was no interactive effect of the Level and Number of Topics, F (4, 99) = .65, p= .63, η^2= .03.

(6) For the advanced non-CHL group: (a) Among the single-component Chinese characters, there was a significant effect of the Level, F (2, 18) = 25.55, p< .001, η^2= .74. The result showed that the accuracy of the elementary characters was significantly higher than the intermediate characters (p< .001), and the accuracy of the intermediate characters was significantly higher than the advanced characters (p< .05). There was no significant effect of the Type, F (1, 18) = 1.62, p= .22, η^2= .08. The accuracy of the pictographs was not different from the accuracy of the self-explanatory characters. And there was no significantly interactive effect of the Level and Type, F (2, 18) = 3.36, p= .06, η^2= .27. (b) Among the compound Chinese characters, there was no effect of the Structure, F (2, 61) = .61, p= .55, η^2= .02, which suggested that there were no differences among the accuracy of the left-right, top-down, and (half)surrounded characters for the advanced non-CHL learners. There was a significant effect of the Level, F (2, 61) = 56.29, p< .001, η^2= .65. The result suggested that the accuracy of the elementary compound characters was significantly higher than the intermediate compound characters (p< .001), and the accuracy of the intermediate characters

was significantly higher than the advanced characters ($p < .001$). There was no effect of the Number of Strokes, F (1, 61) = 1.37, $p = .25$, $\eta^2 = .02$, which showed that the accuracy of the characters with many strokes was not different from the accuracy of the characters with fewer strokes. There was a significant effect of the Type, F (1, 61) = 13.07, $p < .01$, $\eta^2 = .18$, which demonstrated that the accuracy of the phonograms was significantly higher than the accuracy of associative compounds. Moreover, there was a marginally significant interactive effect of the Level and Type, F (2, 61) = 3.06, $p = .054$, $\eta^2 = .09$. The simple effect analysis revealed that the accuracy of the advanced phonograms was significantly higher than the advanced associative compounds ($p < .001$), but the Type had no significant effects in the elementary and intermediate Chinese characters ($p = .61$ & $p = .08$ respectively). Also, there was a marginally significant interactive effect of the Structure and Number of Strokes, F (2, 61) = 2.70, $p = .075$, $\eta^2 = .08$. The simple effect analysis suggested that the accuracy of the (half)surrounded characters of fewer strokes was significantly higher than the (half)surrounded characters of many strokes ($p < .05$), but the Number of Strokes had no significant effects in the left-right and top-down structured characters ($p = .58$ & $p = .37$ respectively). (c) Among the two-character words, there was a significant effect of the Level, F (2, 99) = 25.23, $p < .001$, $\eta^2 = .34$. The result showed that the accuracy of the elementary words was significantly higher than the accuracy of the intermediate words ($p < .001$), and the accuracy of the intermediate words was significantly higher than the advanced words ($p < .01$). Also, there was a significant effect of the Number of Topics, F (2, 99) = 33.31, $p < .001$, $\eta^2 = .40$, which indicated that the accuracy of the words of many topics was significantly higher than the accuracy of the words of medium topics ($p < .01$), and the accuracy of the words of medium topics was significantly higher than the words of few topics ($p < .001$). There was no interactive effect of the Level and Number of Topics, F (4, 99) = .32, $p = .86$, $\eta^2 = .01$.

Table 6 is a summary of these results.

Table 6 Results of the different types of Chinese characters and words among CHL and non-CHL learners

Group	Chinese Level	Single-component Chinese Characters	Compound Chinese Characters	Two-character Words
CHL	Elementary	elementary > intermediate = advanced characters pictographs = self-explanatory characters	top-down > (half)surrounded characters, left-right = top-town, left-right = (half)surrounded elementary > intermediate = advanced characters characters with few strokes > characters with many strokes no significant effect of the Type	elementary > intermediate = advanced words words of many topics > medium topics > few topics
	Intermediate	elementary > intermediate > advanced characters pictographs > self-explanatory characters	no significant effect of the Structure elementary > intermediate > advanced characters characters with few strokes = characters with many strokes phonograms > associative compounds	elementary > intermediate > advanced words words of many topics > medium topics > few topics
	Advanced	elementary > intermediate = advanced characters pictographs = self-explanatory characters	no significant effect of the Structure elementary > intermediate > advanced characters characters with few strokes = characters with many strokes phonograms > associative compounds	elementary > intermediate > advanced words words of many topics > medium topics > few topics
Non-CHL	Elementary	elementary > intermediate = advanced characters pictographs > self-explanatory characters	no significant effect of the Structure elementary > intermediate = advanced characters characters with few strokes > characters with many strokes phonograms = associative compounds	elementary > intermediate > advanced words words of many topics > medium topics > few topics
	Intermediate	elementary > intermediate > advanced characters pictographs = self-explanatory characters	no significant effect of the Structure elementary > intermediate > advanced characters characters with few strokes > characters with many strokes phonograms > associative compounds	elementary > intermediate > advanced words words of many topics > medium topics > few topics
	Advanced	elementary > intermediate > advanced characters pictographs = self-explanatory characters	no significant effect of the Structure elementary > intermediate > advanced characters characters with few strokes = characters with many strokes phonograms > associative compounds	elementary > intermediate > advanced words words of many topics > medium topics > few topics

Note. "A > B" means the accuracy of A is significantly higher than the accurayc of B.
"A = B" means the accuracy of A is not different from the accurayc of B.

4.3 Results of the L2 Chinese learning motivation and the frequency of extracurricular Chinese activity engagement

This section compares L2 Chinese learning motivation and the frequency of attending extracurricular Chinese activities between the CHL and non-CHL groups.

The reliability of the L2 Chinese learning motivation scale (40 items) was tested in SPSS27.0. Results showed that Cronbach's α = .94 for the CHL group and Cronbach's α = .93 for the non-CHL group. Moreover, the reliability of each motivational sub-scale in the CHL group were: 0.79 (LE), 0.68 (FI), 0.87 (IS), 0.84 (OS), 0.83 (IE), 0.86 (ICM), 0.69 (IP).

The reliability of each motivational sub-scale in the non-CHL group were: 0.77 (LE), 0.66 (FI), 0.92 (IS), 0.73 (OS), 0.78 (IE), 0.90 (ICM), 0.70 (IP). Lin's (2018) doctoral study validated the seven motivational variables. In this study, KMO and Bartlett's Test showed that KMO = .84 (p< .001) for the CHL group and KMO = .81 (p< .001) for the non-CHL group. Furthermore, the reliability of the frequency of attending extracurricular Chinese activities scale (six items) showed that Cronbach's α = .80 for the CHL group and Cronbach's α = .71 for the non-CHL group. KMO and Bartlett's Test showed that KMO = .83 (p< .001) for the CHL group and KMO = .73 (p< .001) for the non-CHL group.

Next, the comparisons between the two groups are articulated in detail below.

Firstly, the descriptive statistics of the L2 Chinese learning motivation and the frequency of attending extracurricular Chinese activities are presented in Table 7 & 8 below. For the CHL group: (a) The mean score of the L2 Chinese learning motivation was 4.68 (elementary), 4.68 (intermediate), and 4.67 (advanced) separately, and the mean scores of each motivational dimension can be seen in Table 5 for details. (b) The mean score of the frequency of attending extracurricular Chinese activities was 3.05 (elementary), 3.38 (intermediate), and 3.33 (advanced) separately, and the mean scores of each extracurricular Chinese activity can be seen in Table 6 for details. For the non-CHL group: (a) The mean score of the L2 Chinese learning motivation was 3.60 (elementary), 3.75 (intermediate), and 3.95 (advanced) separately, and the mean scores of each motivational dimension can be seen in Table 7 for details. (b) The mean score of the frequency of attending extracurricular Chinese activities was 2.44 (elementary), 2.90 (intermediate), and 2.96 (advanced) separately, and the mean scores of each extracurricular Chinese activity can be seen in Table 8 for details.

Table 7 Descriptive statistics of the L2 Chinese learning motivation among CHL and non-CHL learners

Dependent Variable		Motivation	M_LE	M_FI	M_IS	M_OS	M_IE	M_ICM	M_IP	
Group	Chinese Level	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	N
CHL	Elementary	4.68 (.71)	4.99 (.78)	3.87 (1.05)	4.84 (.86)	4.39 (.90)	5.07 (.76)	4.66 (.89)	4.79 (.83)	29
	Intermediate	4.68 (.65)	5.10 (.68)	3.67 (.96)	5.04 (.87)	4.06 (1.18)	5.05 (.80)	4.82 (1.00)	5.01 (.65)	30
	Advanced	4.67 (.60)	5.07 (.61)	3.49 (1.09)	4.99 (.76)	4.21 (1.05)	5.08 (.68)	4.80 (.91)	4.97 (.73)	30
	Total	4.68 (.65)	5.05 (.69)	3.68 (1.03)	4.96 (.83)	4.22 (1.05)	5.07 (.74)	4.76 (.93)	4.93 (.74)	89
Non-CHL	Elementary	3.60 (.83)	4.39 (.95)	1.82 (.73)	3.76 (1.22)	2.92 (1.00)	4.51 (.98)	3.39 (1.31)	4.12 (1.14)	31
	Intermediate	3.75 (.65)	4.63 (.84)	1.71 (.60)	4.17 (1.16)	2.72 (.67)	4.58 (.82)	3.78 (1.36)	4.50 (.67)	31
	Advanced	3.95 (.72)	4.70 (.78)	1.81 (.53)	4.56 (1.36)	2.76 (.95)	4.92 (.88)	3.97 (1.29)	4.77 (.92)	30
	Total	3.76 (.74)	4.57 (.86)	1.78 (.62)	4.16 (1.28)	2.80 (.88)	4.67 (.91)	3.71 (1.33)	4.46 (.96)	92

Note. M_LE = Motivation_L2 learning experience, M_FI = Motivation_family influence, M_IS = Motivation_ideal L2 self, M_OS = Motivation_ought-to L2 self, M_IE = Motivation_intended effort, M_ICM = Motivation_instrumentality (China and Mandarin), M_IP = Motivation_instrumentality (promotional). The number in the bracket is the standard deviation.

Table 8 Descriptive statistics of the frequency of extracurricular Chinese activity engagement among CHL and non-CHL learners

Dependent Variable		Frequency	F_Speak	F_Watch	F_Listen	F_Visit	F_Read	F_Write	
Group	Chinese Level	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	N
CHL	Elementary	3.05 (.72)	2.34 (.72)	3.69 (1.14)	3.93 (1.07)	2.28 (1.36)	2.69 (.89)	3.38 (.90)	29
	Intermediate	3.38 (.69)	2.80 (1.10)	3.90 (.88)	4.43 (1.04)	2.70 (1.37)	2.87 (1.04)	3.57 (.82)	30
	Advanced	3.33 (.83)	2.67 (1.03)	3.57 (.97)	4.33 (1.12)	2.73 (1.11)	3.27 (1.26)	3.43 (1.01)	30
	Total	3.26 (.75)	2.61 (.97)	3.72 (1.00)	4.24 (1.09)	2.57 (1.29)	2.94 (1.09)	3.46 (.91)	89
Non-CHL	Elementary	2.44 (.55)	1.39 (.67)	3.13 (1.20)	3.68 (1.14)	1.23 (.62)	2.06 (1.00)	3.16 (.90)	31
	Intermediate	2.90 (.56)	1.94 (.68)	3.87 (1.31)	4.23 (.88)	1.58 (.62)	2.71 (.86)	3.06 (.89)	31
	Advanced	2.96 (.63)	1.93 (.87)	3.67 (1.09)	4.17 (1.18)	1.63 (.67)	2.87 (1.07)	3.50 (.86)	30
	Total	2.76 (.62)	1.75 (.78)	3.55 (1.23)	4.02 (1.09)	1.48 (.65)	2.54 (1.03)	3.24 (.89)	92

Note. F_Speak = Frequency of speaking Chinese with family or friends, F_Watch = Frequency of watching Chinese TV programs, F_Listen = Frequency of listening to Chinese songs, F_Visit = Frequency of visiting China town or Chinese market, F_Read = Frequency of reading Chinese books, F_Write = Frequency of writing Chinese characters. The number in the bracket is the standard deviation.

Secondly, we conducted ANOVAs to compare the L2 Chinese learning motivation among the CHL and non-CHL groups at different Chinese language levels. There was a significant effect of Group, F (1, 175) = 77.19, p< .001, η^2= .31. It showed that the average motivation of the CHL learners was significantly higher than the average motivation of the non-CHL learners. There was no significant effect of Chinese Level, F (2, 175) = .93, p= .40, η^2= .01, and no interactive effect of Group and Chinese Level, F (2, 175) = .95, p= .39, η^2= .01. The result suggested that, for the two groups, there were no differences among the average motivation

of the learners at the elementary, intermediate, and advanced Chinese level.

Moreover, we further compared the two groups' L2 Chinese learning motivation at each sub-scale.

(a) L2 learning experience (LE): There was a significant effect of Group, F (1, 175) = 17.03, p< .001, η^2= .09, which showed that the average LE score of the CHL learners was significantly higher than the average LE score of the non-CHL learners. There was no significant effect of Chinese Level, F (2, 175) = 1.12, p= .33, η^2= .01, and no interactive effect of Group and Chinese Level, F (2, 175) = .35, p= .71, η^2= .004. The result illustrated that there were no differences among the average LE scores of the learners at the elementary, intermediate, and advanced Chinese level.

(b) Family influence (FI): There was a significant effect of Group, F (1, 175) = 224.43, p< .001, η^2= .56, which demonstrated that the average FI score of the CHL learners was significantly higher than the average FI score of the non-CHL learners. There was no significant effect of Chinese Level, F (2, 175) = .84, p= .43, η^2= .01, which showed that there were no differences among the average FI scores of the learners at the elementary, intermediate, and advanced Chinese level. And there was no interactive effect of Group and Chinese Level, F (2, 175) = .77, p= .46, η^2= .01.

(c) Ideal L2 self (IS): There was a significant effect of Group, F (1, 175) = 25.41, p< .001, η^2= .13, which demonstrated that the average IS score of the CHL learners was significantly higher than the average IS score of the non-CHL learners. Also, there was a significant effect of Chinese Level, F (2, 175) = 3.12, p< .05, η^2= .03. The result revealed that the average IS

score of the elementary Chinese learners was significantly lower than the average IS score of the advanced learners ($p < .05$), but there were no differences between the elementary and intermediate learners ($p = .11$), and no differences between the intermediate and advanced learners ($p = .37$). There was no interactive effect of Group and Chinese Level, F (2, 175) = 1.46, $p = .24$, $\eta^2 = .02$.

(d) Ought-to L2 self (OS): There was a significant effect of Group, F (1, 175) = 96.71, $p < .001$, $\eta^2 = .36$, which showed that the average OS score of the CHL learners was significantly higher than the average OS score of the non-CHL learners. There was no significant effect of Chinese Level, F (2, 175) = 1.13, $p = .33$, $\eta^2 = .01$, which suggested that there were no differences among the average OS scores of the learners at different Chinese levels. And there was no interactive effect of Group and Chinese Level, F (2, 175) = .09, $p = .91$, $\eta^2 = .001$.

(e) Intended effort (IE): There was a significant effect of Group, F (1, 175) = 10.37, $p < .01$, $\eta^2 = .06$, which showed that the average IE score of the CHL learners was significantly higher than the average IE score of the non-CHL learners. There was no significant effect of Chinese Level, F (2, 175) = 1.17, $p = .31$, $\eta^2 = .01$, which illustrated that there were no differences among the average IE scores of the learners at different Chinese levels. And there was no interactive effect of Group and Chinese Level, F (2, 175) = .99, $p = .37$, $\eta^2 = .01$.

(f) Instrumentality China and Mandarin (ICM): There was a significant effect of Group, F (1, 175) = 37.47, $p < .001$, $\eta^2 = .18$. It suggested that the average ICM score of the CHL learners was significantly higher than the average ICM score of the non-CHL learners. There was no significant effect of Chinese Level, F (2, 175) = 1.64, $p = .20$, $\eta^2 = .02$, which demonstrated

that there were no differences among the average ICM scores of the learners at different Chinese levels. And there was no interactive effect of Group and Chinese Level, F (2, 175) = .54, p= .59, η^2= .01.

(g) Instrumentality promotional (IP): There was a significant effect of Group, F (1, 175) = 13.69, p< .001, η^2= .07, which showed that the average IP score of the CHL learners was significantly higher than the average IP score of the non-CHL learners. Also, there was a significant effect of Chinese Level, F (2, 175) = 4.00, p< .05, η^2= .04. The result suggested that the average IP score of the elementary Chinese learners was significantly lower than the average IP score of the intermediate and advanced learners (p< .05 & p< .01 respectively), but there were no differences between the intermediate and advanced Chinese learners (p= .47). There was no interactive effect of Group and Chinese Level, F (2, 175) = 1.18, p= .31, η^2= .01.

Thirdly, we also conducted ANOVAs to compare the frequency of attending extracurricular Chinese activities among the CHL and non-CHL groups at different Chinese language levels. There was a significant effect of Group, F (1, 175) = 24.12, p< .001, η^2= .12, which suggested that the average frequency of the CHL learners was significantly higher than the average frequency of the non-CHL learners. Also, there was a significant effect of Chinese Level, F (2, 175) = 7.06, p< .01, η^2= .08. The result indicated that the average frequency of the elementary Chinese learners was significantly lower than the average frequency of the intermediate and advanced learners (p< .01 respectively), but there was no difference between the average frequency of the intermediate Chinese learners and the advanced learners (p= .94). There was no interactive effect of Group and Chinese Level, F (2, 175) = .48, p= .62, η^2= .01.

Furthermore, we compared the frequency of attending each extracurricular Chinese activity between the two groups.

(a) Speaking Chinese with family or friends: There was a significant effect of Group, F (1, 175) = 44.48, p< .001, η^2= .20, which suggested that the average speaking frequency of the CHL learners was significantly higher than the average speaking frequency of the non-CHL learners. Also, there was a significant effect of Chinese Level, F (2, 175) = 6.05, p< .01, η^2= .07. It showed that the average speaking frequency of the intermediate and advanced learners was significantly higher than the elementary Chinese learners (p< .01 respectively), but there were no differences between the intermediate and advanced Chinese learners (p= .67). There was no interactive effect of Group and Chinese Level, F (2, 175) = .26, p= .77, η^2= .003.

(b) Watching Chinese TV programs: There was no significant effect of Group, F (1, 175) = .98, p= .32, η^2= .01, which demonstrated that there were no differences in the average watching frequency between the CHL learners and non-CHL learners. There was a marginally significant effect of Chinese Level, F (2, 175) = 2.80, p= .06, η^2= .03. The result showed that the average watching frequency of the intermediate learners was significantly higher than the average watching frequency of the elementary learners (p< .05), but there were no differences among the average watching frequency between the elementary and advanced learners (p= .31), and no differences between the intermediate and advanced learners (p= .19). There was no interactive effect of Group and Chinese Level, F (2, 175) = 1.49, p= .23, η^2= .02.

(c) Listening to Chinese songs: There was no significant effect of Group, F (1, 175) = 1.71, p= .19, η^2= .01, which revealed that there were no differences in the average listening frequency between the CHL learners and non-CHL learners. There was a significant effect of Chinese Level, F (2, 175) = 4.18, p< .05, η^2= .05. The result showed that the average listening frequency of the intermediate and advanced learners was significantly higher than the average listening frequency of the elementary learners (p< .01 & p< .05 respectively), but there was no difference between the intermediate and advanced learners (p= .68). There was no interactive effect of Group and Chinese Level, F (2, 175) = .03, p= .98, η^2= .000.

(d) Visiting China town or Chinese market: There was a significant effect of Group, F (1, 175) = 52.84, p< .001, η^2= .23, which suggested that the average visiting frequency of the CHL learners was significantly higher than the average visiting frequency of the non-CHL learners. Also, there was a significant effect of Chinese Level, F (2, 175) = 3.36, p< .05, η^2= .04. The result showed that the average visiting frequency of the intermediate and advanced learners was significantly higher than the average visiting frequency of the elementary learners (p< .05 respectively), but there was no difference between the intermediate and advanced learners (p= .82). There was no interactive effect of Group and Chinese Level, F (2, 175) = .02, p= .98, η^2= .000.

(e) Reading Chinese books: There was a significant effect of Group, F (1, 175) = 6.63, p< .05, η^2= .04, which demonstrated that the average reading frequency of the CHL learners was significantly higher than the average reading frequency of the non-CHL learners. Also, there was a significant effect of Chinese Level, F (2, 175) = 6.82, p< .01, η^2= .07. The result showed that the average reading frequency of the intermediate and advanced learners was significantly higher than the average reading frequency of the elementary learners (p< .05 &

$p < .001$ respectively), but there was no difference between the intermediate and advanced learners ($p = .14$). There was no interactive effect of Group and Chinese Level, F (2, 175) = .78, $p = .46$, $\eta^2 = .01$.

(f) Writing Chinese characters: There was no significant effect of Group, F (1, 175) = 2.66, $p = .11$, $\eta^2 = .02$, which suggested that there was no difference in the average writing frequency between the CHL and Non-CHL learners. There was no significant effect of Chinese Level, F (2, 175) = .79, $p = .46$, $\eta^2 = .01$, which demonstrated that there were no differences among the average writing frequency of the learners at different Chinese levels. And there was no interactive effect of Group and Chinese Level, F (2, 175) = 1.52, $p = .22$, $\eta^2 = .02$.

4.4 The relationships among the above results

From the above two sections, we know that there exist differences between the CHL and non-CHL learners in terms of the Chinese character reading test, L2 Chinese learning motivation, and the frequency of attending extracurricular Chinese activities. In this section, we conducted Pearson Correlation tests to investigate the relationships among the Chinese character reading achievement, L2 Chinese learning motivation, and the frequency of attending extracurricular Chinese activities, of the CHL and non-CHL participants. The results are presented in Table 9 below.

Table 9 Correlations of the achievement, L2 motivation, and the frequency among CHL and non-CHL learners

Group			Total Score	Motivation	M_LE	M_FI	M_IS	M_OS	M_IE	M_ICM	M_IP	Frequency	F_Speak	F_Watch	F_Listen	F_Visit	F_Read	F_Write
CHL	Total Score	Pearson Correlation	1	.34**	.34**	.08	.35**	.20	.29**	.29**	.36**	.38**	.32**	.15	.27*	.29**	.36**	.23*
		Sig. (2-tailed)		.001	.001	.453	.001	.057	.007	.006	.001	.000	.003	.150	.011	.006	.001	.027
		N	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89
	Motivation	Pearson Correlation		1	.80**	.67**	.84**	.76**	.80**	.72**	.73**	.54**	.36**	.43**	.22*	.41**	.46**	.47**
		Sig. (2-tailed)			.000	.000	.000	.000	.000	.000	.000	.000	.001	.000	.040	.000	.000	.000
		N	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89
	Frequency	Pearson Correlation			.56**	.19	.58**	.24*	.50**	.39**	.59**	1	.63**	.79**	.67**	.75**	.79**	.61**
		Sig. (2-tailed)			.000	.068	.000	.023	.000	.000	.000		.000	.000	.000	.000	.000	.000
		N	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Non-CHL	Total Score	Pearson Correlation	1	.58**	.49**	.24*	.57**	.21*	.50**	.46**	.59**	.60**	.44**	.38**	.40**	.31**	.45**	.35**
		Sig. (2-tailed)		.000	.000	.021	.000	.042	.000	.000	.000	.000	.000	.000	.000	.002	.000	.001
		N	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92
	Motivation	Pearson Correlation		1	.86**	.57**	.84**	.63**	.83**	.73**	.84**	.75**	.46**	.56**	.61**	.22*	.46**	.51**
		Sig. (2-tailed)			.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.034	.000	.000
		N		92	92	92	92	92	92	92	92	92	92	92	92	92	92	92
	Frequency	Pearson Correlation			.63**	.40**	.63**	.42**	.64**	.60**	.66**	1	.59**	.74**	.76**	.48**	.70**	.52**
		Sig. (2-tailed)			.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
		N			92	92	92	92	92	92	92	92	92	92	92	92	92	92

Note. **. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

From Table 9, it can be seen that, for both groups, the total score of the Chinese character reading test was significantly positively correlated with L2 Chinese learning motivation (CHL: $r = .34$, $p < .01$, non-CHL: $r = .58$, $p < .001$) and the frequency of attending extracurricular Chinese activities (CHL: $r = .38$, $p < .001$, non-CHL: $r = .60$, $p < .001$), suggesting that the learners with higher motivation and frequency in learning Chinese generally had better Chinese character reading achievement. Moreover, there was a strong positive correlation between the L2 Chinese learning motivation and the frequency of attending extracurricular Chinese activities in both groups (CHL: $r = .54$, $p < .001$, non-CHL: $r = .75$, $p < .001$).

Furthermore, we compared the relationships between the CHL and non-CHL groups via Preacher (2002)'s *Calculation for the test of the difference between two independent correlation coefficients*. The result indicated that there was a significant difference between the score-motivation correlations in CHL and non-CHL groups, $z = 2.03$, $p < .05$ (two-tailed), suggesting that the relationship between the total score of the Chinese character reading test and the L2 Chinese learning motivation of the non-CHL learners was stronger than the CHL learners. There was a marginally significant difference between the score-frequency

correlations in CHL and non-CHL groups, $z = 1.94$, $p = .052$ (two-tailed), suggesting that the relationship between the total score and the frequency of the non-CHL learners was slightly stronger than the CHL learners. There was a significant difference between the motivation-frequency correlations in CHL and non-CHL groups, $z = 2.41$, $p < .05$ (two-tailed), suggesting that the relationship between the motivation and the frequency of the non-CHL learners was stronger than the CHL learners. Also, we compared the correlation between the total score and the motivation, and the correlation between the total score and the frequency among the two groups via Lee & Preacher (2013)'s *Calculation for the test of the difference between two dependent correlations with one variable in common*. The result showed that the relationship between the total score and the motivation was same as the correlation between the total score and the frequency in both groups, for the CHL group: $z = - .39$, $p = .69$ (two-tailed), for the non-CHL group: $z = - .33$, $p = .74$ (two-tailed).

In addition, the relationships between the Chinese character reading achievement and the sub-motivational factors, and the frequency of different extracurricular Chinese activities, were also observed.

(a) For the CHL group, there were moderate positive correlations between the total score and the L2 learning experience ($r = .34$, $p < .01$), the total score and the ideal L2 self ($r = .35$, $p < .01$), and the total score and the instrumentality (promotional) ($r = .36$, $p < .01$). There were small positive correlations between the total score and the intended effort ($r = .29$, $p < .01$), the total score and the instrumentality (China and Mandarin) ($r = .29$, $p < .01$). However, no significantly positive relationship was observed between the total score and family influence ($r = .08$, $p = .453$), and between the total score and the ought-to L2 self ($r = .20$, $p = .057$) in the present study. Furthermore, there existed moderate positive correlations between the total

score and the frequency of speaking Chinese ($r = .32$, $p < .01$), and the total score and the frequency of reading Chinese books ($r = .36$, $p < .01$). There were small positive correlations between the total score and the frequency of listening to Chinese songs ($r = .27$, $p < .05$), the total score and the frequency of visiting China town or Chinese market ($r = .29$, $p < .01$), the total score and the frequency of writing Chinese characters ($r = .23$, $p < .05$). But no significant positive relationship was observed between the total score and the frequency of watching Chinese TV programs in this study ($r = .15$, $p = .150$).

(b) For the non-CHL group, there were relatively strong positive correlations between the total score and the ideal L2 self ($r = .57$, $p < .001$), the total score and the intended effort ($r = .50$, $p < .001$), and the total score and the instrumentality (promotional) ($r = .59$, $p < .001$). There were moderate positive correlations between the total score and the L2 learning experience ($r = .49$, $p < .001$), the total score and the instrumentality (China and Mandarin) ($r = .46$, $p < .001$). There were small positive correlations between the total score and family influence ($r = .24$, $p < .05$), the total score and the ought-to L2 self ($r = .21$, $p < .05$). Moreover, there existed moderate positive correlations between the total score and the frequency of speaking Chinese ($r = .44$, $p < .001$), the total score and the frequency of watching Chinese TV programs ($r = .38$, $p < .001$), the total score and the frequency of listening to Chinese songs ($r = .40$, $p < .001$), the total score and the frequency of visiting China town or Chinese market ($r = .31$, $p < .01$), the total score and the frequency of reading Chinese books ($r = .45$, $p < .001$), and the total score and the frequency of writing Chinese characters ($r = .35$, $p < .01$).

After the correlation test, we conducted the multiple regression analysis to further examine the relationships between L2 Chinese learning motivation, extracurricular Chinese

engagement frequency, and the Chinese character reading achievement among the CHL and non-CHL learners. As the correlation test results suggested that there were significantly positive associations between the L2 motivation and Chinese character reading achievement, between the extracurricular Chinese engagement frequency and character reading achievement, as well as between the L2 motivation and the frequency, we then adopted the regression-based approach to investigate the mediation effect of the extracurricular Chinese engagement frequency on the relationship between L2 Chinese learning motivation and Chinese character reading achievement among the two groups of learners. Three regression procedures were conducted step by step and the results are as follows.

Firstly, we analyzed the character reading achievement (total score) regressed on L2 motivation in the CHL and non-CHL groups respectively. The results showed that L2 motivation could significantly predict the learners' Chinese character reading scores, F (1, 87) =11.74, β = .34, t =3.43, p< .01 (CHL group); F (1, 90) =46.27, β = .58, t =6.80, p< .001 (non-CHL group). For the CHL learners, it could explain 11.89% of the total variance of the total character reading score. While for the non-CHL learners, it could explain 33.95% of the total variance of the character reading score. A summary of this regression analysis can be seen in Table 10 below.

Table 10 Regression analysis for the relationship between L2 motivation and Chinese character reading achievement

			Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations		
Group	Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
CHL (N=89)	1	(Constant)	-18.78	36.61		-0.51	0.609	-91.54	53.98			
		Motivation	26.56	7.75	0.34	3.43	0.001	11.15	41.97	0.34	0.34	0.34
Non-CHL (N=92)	1	(Constant)	-30.09	17.66		-1.70	0.092	-65.18	5.00			
		Motivation	31.32	4.60	0.58	6.80	0.000	22.17	40.46	0.58	0.58	0.58

Note. CHL: R^2 = .12, F (1, 87) = 11.74, p < .01; ** p < .01. Non-CHL: R^2 = .34, F (1, 90) = 46.27, p < .001; *** p < .001.

Secondly, we conducted regression analysis between the frequency of extracurricular Chinese engagement and L2 motivation among the two groups. The results indicated that L2 motivation could also significantly predict the learners' frequency of attending after-class Chinese activities, F (1, 87) =36.73, β = .54, t =6.06, p< .001 (CHL group); F (1, 90) =116.62, β = .75, t =10.80, p< .001 (non-CHL group). Moreover, it could explain 29.69% of the total variance of the CHL learners' average frequency, and it could explain 56.44% of the total variance of the non-CHL learners' average frequency to attend extracurricular Chinese activities. A summary of this regression analysis can be seen in Table 11.

Table 11 Regression analysis for the relationship between L2 motivation and extracurricular Chinese engagement frequency

			Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations		
Group	Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
CHL (N=89)	1	(Constant)	0.29	0.49		0.58	0.561	-0.69	1.27			
		Motivation	0.63	0.10	0.54	6.06	0.000	0.43	0.84	0.54	0.54	0.54
Non-CHL (N=92)	1	(Constant)	0.41	0.22		1.82	0.072	-0.04	0.85			
		Motivation	0.63	0.06	0.75	10.80	0.000	0.51	0.74	0.75	0.75	0.75

Note. CHL: R^2 = .30, F (1, 87) = 36.73, p < .001; *** p < .001. Non-CHL: R^2 = .56, F (1, 90) = 116.62, p < .001; *** p < .001.

Thirdly, we then examined the Chinese character reading achievement (total score) regressed on L2 motivation and the extracurricular Chinese engagement frequency in the two groups respectively. The results revealed that for the CHL learners, L2 motivation and frequency together could significantly predict their character reading achievement, F (2, 86) = 8.97, p< .001. The two factors together could explain 17.26% of the total variance of character reading score. The frequency of extracurricular Chinese engagement was a significant predictor of character reading score (β = .28, t =2.36, p< .05), while the estimated residual direct effect of L2 motivation on Chinese character reading score was not significant after

controlling for the effect of the mediator of frequency (β = .19, t =1.66, p= .10). For the non-CHL learners, L2 motivation and frequency together could significantly predict their character reading achievement, F (2, 89) = 29.81, p< .001. The two predictors together could explain 40.12% of the total variance of character reading score. The frequency of extracurricular Chinese engagement was a significant predictor of character reading score (β = .38, t =3.03, p< .01), and the estimated residual direct effect of L2 motivation on the character reading score was still significant after controlling for the effect of the mediator of frequency, (β = .30, t =2.42, p< .05). Table 12 displays a summary of this regression analysis.

Table 12 Multiple regression analysis for the relationships between L2 motivation, frequency, and Chinese character reading achievement

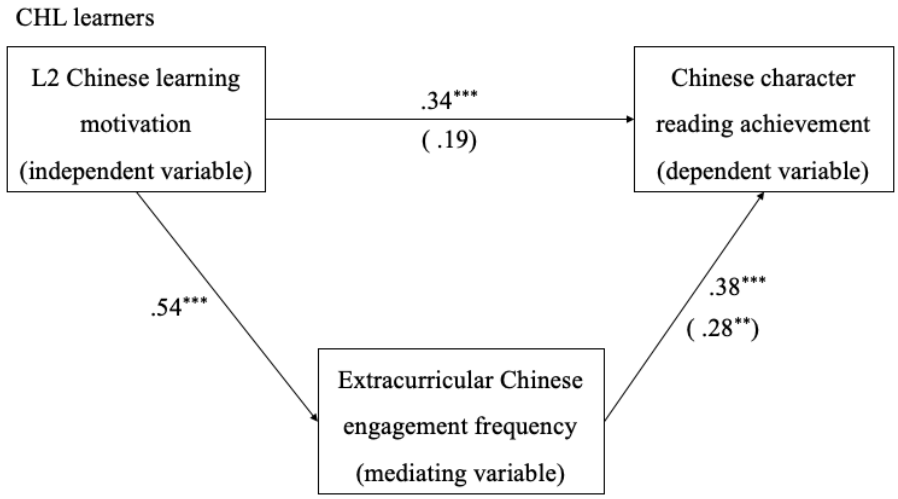
			Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations		
Group		Model	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
CHL (N=89)	1	(Constant)	-24.05	35.75		-0.67	0.503	-95.12	47.02			
		Motivation	14.96	9.01	0.19	1.66	0.101	-2.96	32.88	0.34	0.18	0.16
		Frequency	18.28	7.74	0.28	2.36	0.020	2.90	33.67	0.38	0.25	0.23
Non-CHL (N=92)	1	(Constant)	-39.91	17.22		-2.32	0.023	-74.13	-5.69			
		Motivation	16.13	6.68	0.30	2.42	0.018	2.86	29.41	0.58	0.25	0.20
		Frequency	24.23	8.01	0.38	3.03	0.003	8.32	40.14	0.60	0.31	0.25

Note. CHL: R^2 = .17, F (2, 86) = 8.97, p < .001; *** p < .001. Non-CHL: R^2 = .40, F (2, 89) = 29.81, p < .001; *** p < .001.

Furthermore, we conducted the Sobel test in MedGraph (Jose, 2013) to compute the mediation effects and draw the mediation graphs among three variables (motivation, frequency, achievement) for the CHL and non-CHL learners respectively. The mediation graph of the CHL group is shown in Figure 6. There was a significant indirect effect from L2 motivation to Chinese character reading achievement through the frequency of attending extracurricular Chinese activities (z =2.20, p< .05). The indirect effect to total ratio was .44 and the variance explained by it was .09. The result suggests that the CHL learners with higher Chinese learning motivation tended to have higher extracurricular Chinese engagement frequency and thus could gain better Chinese character reading achievement.

The direct effect of L2 motivation on the character reading score remained not to be significant (t =1.66, p= .10), suggesting that there might not be other mediators that can account for the relationship between their L2 motivation and Chinese character reading achievement.

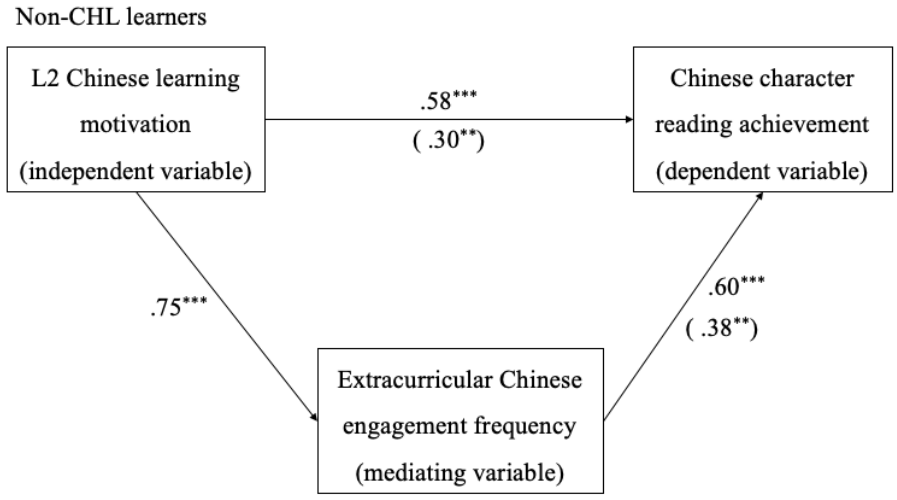
Figure 6 The mediation graph of the CHL group



Note. Standardized regression coefficients are shown. The numerical values in the parentheses are beta weights taken from the regression of achievement on motivation and frequency and the other values are zero order correlations. * p< .05, ** p< .01, *** p< .001.

Moreover, the mediation graph of the non-CHL group is shown in Figure 7. There was a significant mediating effect of the frequency to attend extracurricular Chinese activities (z =2.91, p< .01). The indirect effect to total ratio was .48 and the variance explained by it was .30. The result suggests that the non-CHL learners with higher Chinese learning motivation tended to participate in after-class Chinese activities more frequently and thus may have better Chinese character reading achievement. Also, the direct effect from L2 motivation to character reading score remained to be significant but reduced in greatness (t =2.42, p< .05), which suggests the presence of other mediators that can explain the relationship between L2 motivation and their character reading achievement.

Figure 7 The mediation graph of the non-CHL group



Note. Standardized regression coefficients are shown. The numerical values in the parentheses are beta weights taken from the regression of achievement on motivation and frequency and the other values are zero order correlations. * $p < .05$, ** $p < .01$, *** $p < .001$.

In summary, the correlation test results tell us that for both groups, the learners with higher L2 Chinese learning motivation and frequency of attending extracurricular Chinese activities tended to have better Chinese character reading achievement, and the students with higher motivation in learning Chinese generally had higher frequency to attend extracurricular Chinese activities. And the correlation between the total score and the motivation was not different from the correlation between the total score and the frequency. On the other hand, the relationships between the total score of the Chinese character reading tests, L2 Chinese learning motivation, and the frequency of attending extracurricular Chinese activities of the non-CHL learners were relatively stronger than the CHL learners. In addition, the regression analysis revealed that L2 motivation and the frequency of extracurricular Chinese engagement could significantly predict the Chinese character reading achievement among both CHL and non-CHL learners, but the two predictors explained more variance of the character reading score in the non-CHL group than in the CHL group. We also found the

significant mediating effect of the extracurricular Chinese engagement frequency on the relationship between L2 Chinese learning motivation and Chinese character reading achievement in both groups based on the regression approaches and Sobel test. After controlling for the effect of the mediator of frequency, the direct effect of L2 motivation on the character reading score remained insignificant in the CHL group but significant in the non-CHL group, suggesting that there could exist other mediators for the non-CHL learners.

4.5 Findings from the students' views

In this section, I will compare the perspectives of the CHL and non-CHL students in learning Chinese characters under the formal context (classroom teaching and textbooks). The data was coded and analyzed in NVivo 12.7.0, and the core findings are presented in Table 13 below. There are commonalities and differences in the CHL and non-CHL learners' views on Chinese character instruction in class and textbooks. Furthermore, the CHL participants used more Chinese to answer the five questions than non-CHL participants.

Table 13 The views on Chinese character instruction in class and textbooks among CHL and non-CHL learners

Views	CHL learners	Non-CHL learners
Chinese character instruction in **class**	1. Teaching charm: enthusiastic (6), patient (4), responsible (10), creative (5), various teaching methods (18) 2. Close to students' life (8) 3. Interesting: imagination (10), history (12), structural rules (13), vivid examples (7) 4. Limited class time (15)	1. Teaching charm: enthusiastic (16), patient (10), responsible (23), creative (9), various teaching methods (37) 2. Close to students' life (13) 3. Interesting: make up stories (9), semantic radicals (5), vivid examples (10) 4. Complex & Time-consuming (23)
Chinese character instruction in **textbooks**	1. Satisfaction: some Chinese characters and words close to life (6), suitable for each level (9), helpful (24), easy to learn (14) 2. Dissatisfaction: insufficient Chinese characters and words (8), simple (7), not practical (11), dislike writing Chinese characters (9), no Vietnamese translations (4)	1. Satisfaction: some Chinese characters and words close to life (15), suitable for each level (13), helpful (22), abundant Chinese characters and words (5) 2. Dissatisfaction: boring (9), rigid (7), unattractive (7), outdated (4), time-consuming (8), not practical (11), dislike writing Chinese characters (13), no Vietnamese translations (5)

Note. The views on textbooks also include the workbooks.
The number in parentheses indicates the number of occurrences of the word.

4.5.1 Students' views on Chinese character instruction in class

Firstly, in terms of the perspectives on Chinese character instruction in class, one major commonality is that both CHL and non-CHL learners attached great importance to the Chinese instructor's teaching charm in teaching Chinese characters and new words, such as the teacher's enthusiasm, patience, responsibility, creative and various teaching methods. For example,

Chinese instructors' teaching charm

CHL learners:

#1 "老师对我们总是耐心，我很喜欢。另外我们还可以学习书法，X 老师是一个很好的老师，我觉得自己很幸运才能得到他们的教学。" [The teacher is always patient with us. I like (him/her) very much. Also, we can learn Chinese calligraphy. Teacher X is a nice teacher, and I feel very lucky to have their teaching.]

#2 “Phần dạy chữ Hán trên lớp, các thầy cô đã giúp tôi lấy ví dụ minh họa và giải thích nghĩa của từ cũng như cách dùng của nó giúp tôi có thể dễ dàng nhớ chữ hơn. Hơn nữa mỗi thầy cô lại có phong cách dạy khác nhau, có người cho đặt câu với chúng để dễ nhớ hơn, cũng có người dạy tôi viết thật nhiều lần để nhớ nó, lại có người dạy học thuộc các câu ví dụ chứa nó hoặc học thuộc bộ thủ để nhớ chữ hơn. Hơn thế nữa, thầy cô còn giải thích nguồn gốc và những câu chuyện ý nghĩa thú vị đằng sau con chữ kích thích sự tò mò và khiến tôi dễ nhớ từ hơn.” [When teaching Chinese characters in class, teachers will give examples to explain the meaning and usage of words, helping me to remember them easily. Moreover, every teacher’s teaching style is different. Some teachers will make words together in sentences for us to remember them more easily. Some will teach me to write many times to help me memorize, and some will lead me to remember the example sentences that contain it or the radicals of the Chinese character to help me remember it. Besides, the teachers will also explain the origins of the Chinese characters and the interesting stories behind them, which stimulates my curiosity and makes it easier for me to remember them.]

#3 “Đối với tôi những giảng viên dạy hoa văn vô cùng giỏi và tôi rất hâm mộ giảng viên của tôi. Trong mỗi buổi học giảng viên đã dạy cho tôi biết rất nhiều từ mới và dạy tôi học như thế nào là hiệu quả nhất” [For me, the Chinese teacher is very good, and I am a big fan of him/her. In every class, the teacher teaches me many new words and how to learn them most effectively.]

#4 “Tiếp cận từ mới một cách hiệu quả và dễ nhớ. Cụ thể như giáo viên giải thích từ mới (sử dụng trong trường hợp nào), phân tích bộ để dễ thuộc từ, nghe từ mới đồng thời nghe cả đoạn hội thoại để thấy được cách từ mới được sử dụng.” [Learn new Chinese characters effectively

and easily. Specifically, the teacher explains new words (in which case to use) and analyzes the structure of Chinese characters, which facilitates us to memorize them easily. (We) listen to new words while listening to the entire conversation to understand how they are used.]

#5 "Tôi nghĩ giáo viên rất sáng tạo trong việc dạy chữ Hán và từ mới. Ví dụ: thầy cô dạy bằng nhiều hình thức khác nhau, gồm viết thư pháp, dựng tình huống giao tiếp, đọc đoạn văn, viết đoạn văn" [I think the teacher is very creative in teaching Chinese characters and new words. For example, the instructor teaches in a variety of ways, including calligraphy, situational communication, reading texts, and writing essays.]

#6 "Em thấy giáo viên dạy rất kiên nhẫn với tụi em. ví dụ như từ nào không biết đọc cô sẽ chỉ tới khi lưu loát từ đó." [I think the teacher is very patient with us. For example, if there is a word we do not recognize, she will guide us until we fully understand it.]

Non-CHL learners:

#1 "Giáo viên hướng dẫn của tôi có cách dạy rất phong phú, ví dụ như cô ấy có thể giúp tôi tưởng tượng ra các hình ảnh khác nhau để miêu tả mặt chữ đó." [My instructor has a wealth of teaching methods, such as imagining different drawings to describe the appearance of Chinese characters to help me learn them.]

#2 "Trên lớp thầy cô dạy rất nhiệt tình, thường đối với người mới học việc nhớ chữ Hán sẽ hơi khó khăn. Nên thầy cô đã chỉ cho chúng em những cách nhớ chữ Hán dễ dàng hơn một chút. Như 买 thêm 十 thành 卖 (vì bán sẽ có được nhiều tiền hơn mua). Ngoài ra, thầy cô vẫn thường xuyên kiểm tra từ vựng bằng cách đặt câu, nghe thầy cô đọc rồi chép lại câu, nên bút thuận và chữ Hán của chúng em đa số vẫn rất ổn ạ." [In class, the teachers are very

enthusiastic. It is a little difficult for beginners to memorize Chinese characters, so the teacher shows us some ways to remember Chinese characters more easily. For example, add "十" to the top of "买" (buy) and it becomes "卖" (sell) (because selling is more profitable than buying). Moreover, the teachers also often check vocabulary by having us make sentences and taking dictation, so most of our stroke order and Chinese characters are good.]

#3 "vào năm nhất thì thầy cô dạy chữ Hán rất kĩ: Thầy cô cho viết theo thứ tự nét, Cách đọc, cách dùng từ đó và ý nghĩa các bộ thủ liên quan (đối với những chữ có ý nghĩa thể hiện rõ trên mặt chữ) và lặp từ nhiều lần để khắc ghi. Ví dụ từ 男 được giải thích bao gồm bộ 田 (điền: ruộng) và bộ 力(lực: sức mạnh): những người dùng sức cày ruộng, gánh vác những việc nặng nhọc ngày xưa được gọi là: Nam. Từ này được lặp đi lặp lại trong suốt buổi học đó theo các ví dụ trong giáo trình và ví dụ bên ngoài." [In the first year, the teachers taught Chinese characters very seriously: The teacher asked them to write in stroke order, how to read, how to use this Chinese character, and the meaning of the relevant radicals (some characters that can be clearly expressed literally) and repeat many times to memorize it. For example, the interpretation of the word "男" includes two parts: "田" (田: field) and "力" (力: strength): In the past, the person who worked hard on the fields and shouldered the heavy responsibility was called: 男. Based on the textbook examples and other examples, this Chinese character is repeated throughout the lesson.]

#4 "Giáo viên dạy chữ Hán rất nhiệt tình, sáng tạo, cách truyền tải dễ hiểu giúp bài học đạt hiệu quả cao." [The Chinese teacher is very enthusiastic and creative, and the teaching is easy to understand, making the course very efficient.]

#5 “Cô ấy dạy rất tận tâm và kiên nhẫn khi dạy từ mới và chữ Hán. Không phải ai cũng có năng khiếu về ngôn ngữ đặc biệt là tiếng Trung, nên khi tiếp xúc từ mới, các bạn mất nhiều thời gian để tiếp nhận và cô rất nhẫn nại chỉ từng từ từng phát âm cho đến khi bạn đó đọc được và nhớ được.” [The teacher is very dedicated and patient when teaching new words and Chinese characters. Not everyone is gifted with languages, especially Chinese, so when you come across new words, it takes a long time for you to recognize them. She is very patient with the pronunciation word by word until we can read it and remember it.]

#6 “tôi nghĩ là cách giáo viên dạy chưx hán và từ mới vô cùng tận tình và dễ hiểu. vì khi dạy các giáo viên thường cho những ví dụ minh họa cho những từ mới hoặc những hinh ảnh cụ thể, điều đó làm cho sinh viên dễ nhớ hơn.” [I think the way the instructor teaches Chinese characters and new words is very devoted and easy to understand. Because the instructor often gives examples of the new words or provides specific pictures in class, so that it is easier for students to remember.]

Another commonality is that both CHL and non-CHL learners thought it was very helpful when the Chinese characters and words are close to their life, such as in relation to their majors, future career, daily diet, greetings, etc. For instance,

Chinese characters close to life

CHL learners:

#1 “專業的漢字是喜歡 跟我生活的無關的生詞不喜歡。例如:我當會計不能逼我學工程師的生詞” [I like the Chinese characters related to my major, and I am not fond of those irrelevant to my life. For example, I will be an accountant, so I cannot be forced to learn new

words for engineers.]

#2 “Yêu thích nhất là chủ đề về mua bán hàng vì nếu như có dịp đi du lịch trung quốc lần nữa thì sẽ dễ dàng trao đổi với người bán hơn” [I like the topics of buying and selling goods the most because if I have the opportunity to travel to China again, it will be easier to talk to the sellers.]

#3 “我最喜欢的内容是关于生活的环境，因为它更容易记住和应用” [My favorite content is about the environment of life because it is easier to remember and apply (these Chinese characters and words).]

Non-CHL learners:

#1 “Nội dung chữ Hán tôi yêu thích nhất là phần dạy các từ vựng dùng để giao tiếp, vì tôi cần học cho việc giao tiếp nhiều hơn.” [I like daily words the most because I want to learn more that can be used in everyday communication.]

#2 “Nội dung yêu thích nhất như các mẫu câu hay từ vựng có thể sử dụng trong giao tiếp hàng ngày như mua bán, học tập,…” [(My) favorite content is the sentence patterns and words that can be used for daily communication, such as buying, selling, and learning, etc.]

#3 “Em thích nhất đó là chữ Hán về cuộc sống hằng ngày, thực phẩm, công việc vì nó giúp ích trực tiếp cho đời sống sinh hoạt.” [My favorite (Chinese characters and words) are those used in everyday life, food and work because they are close to daily life.]

Nevertheless, the CHL and non-CHL learners held different views about the fascination of teaching content. Although both groups believed it was very interesting to learn Chinese

characters in class, they emphasized different aspects. CHL students focused more on the imagination, history, structural rules, and vivid examples behind Chinese characters, whereas non-CHL students thought learning Chinese characters fascinating mainly because they can make up interesting stories and use semantic radicals and vivid examples to remember the characters. The supporting examples are as follows.

Imagination, history, structural rules (CHL learners)

#1 “Tôi cảm thấy việc học chữ Hán trên lớp rất thú vị, giáo viên đưa ra những ví dụ giúp chúng tôi dễ nhớ từ mới hơn.” [I think learning Chinese characters in class is very interesting, and the teacher will give many examples to help us memorize new words.]

#2 “Phần dạy của giáo viên rất thú vị làm học sinh hào hứng trong giờ học, có những ví dụ thực tế, sinh động làm học sinh dễ nhớ bài.” [The instructor's (Chinese character) teaching part is very interesting and makes the students excited in class. With practical and vivid examples, it is easy for students to memorize the text.]

#3 “我发现教授汉字的课程对我来说非常有趣，就像“爬”一个字意味着登山，当我看着它时，我觉得有人在爬山。” [I find the classes that teach Chinese characters very interesting to me, like the Chinese character “爬” means to climb the mountain, and when I look at it, I feel like someone is climbing a mountain.]

#4 “我觉得学汉语很有意思，特别是学汉字。因为汉字虽然数量多、形体复杂，却是组织严密、规律性很强的文字体系。传统的造字方法一般分为象形、指事、会意、形

声四种。例如：象形造字法：就是画出一个实物的形体、笔画随着物体的形状曲折变化。“日”、“月”就是用这种方法造出来的字。” [I think learning Chinese is very interesting, especially learning Chinese characters. Although Chinese characters are numerous in number and complex in shape, they are a well-organized and regular writing system. The traditional methods of making Chinese characters are generally divided into four types: pictographs, indicative characters, associative compounds, and semantic-phonetic compounds. For example, pictograph: It is to draw the shape of a real object, and the strokes change with the shape of the object. “日” and “月” are the characters created in this way.]

#5 “tôi nghĩ về phần dạy chữ Hán trên lớp khá thú vị và hấp dẫn, ví dụ cô thường xuyên đưa ra những ví dụ liên quan tới từ mới từ đó mở rộng ra thêm nhiều từ mới.” [I think Chinese character instruction in class is fascinating and attractive. For example, the teacher often gives example sentences related to new words, from which many new words can be expanded.]

#6 “每次教学，他们都对我们讲讲很多有意义的知识，有的哪个字或某个大人物的故事，有的历史的事件，还有中华的文化和饮食.....” [Every time they teach, they tell us a lot of meaningful knowledge, some of which is a Chinese character or the story of a big person, some historical events, and Chinese culture and food...]

#7 “老师教汉字和生词的方式也很有意思，特别是写汉字。例如：遇到每个“象形字”，老师会画出来这个字甲骨文会怎么写的，然后介绍汉字字体演变。” [The way the instructor teaches Chinese characters and new words is also very interesting, especially in writing Chinese characters. For example, when encountering each “pictographic character”,

the teacher will draw out how the character was written in oracle bone inscriptions and then introduce the evolution of the Chinese character font.]

#8 "我最喜欢的是老师使用剖析、讲解汉字本身的涵义与来源历史。从汉字的构造上可以看出创始人、时代对于事物的看法。没有不喜欢的汉字教学" [What I like most is the teacher's use of analysis and explanation of the meaning and origin of Chinese characters. From the construction of Chinese characters, we can see the views of the creators and times on things. There is no Chinese character instruction (I) do not like.]

Make up stories and use semantic radicals (Non-CHL learners)

#1 "Mình thấy rất thú vị. Thầy cô ra nhiều ví dụ rất sống động. Tạo cơ hội để người học luyện nói với nhau." [I find it very interesting. The teachers give many very vivid examples and create opportunities for learners to practice speaking with each other.]

#2 "Để có thể nhớ được nhiều và nhanh chóng các chữ hán ghép. Giáo viên cần dạy các bộ thủ thường xuất hiện trong tiếng Hán, vì nhớ được chúng, sẽ giúp học sinh nhanh chóng học thuộc được các chữ Hán khác. Ví dụ: Khi học chữ 妈妈 (Māmā: Mẹ) ta nhớ được bộ nữ 女：dùng để chỉ con gái, phụ nữ. Như vậy khi học các chữ như: 妹妹 (Mèimei: em gái), 姐姐 (Jiě Jie: chị gái) …sẽ nhớ nhanh hơn, vì những chữ này đều xuất hiện bộ 女, đều liên quan tới con gái, phụ nữ." [Help to memorize more Chinese characters quickly. The teacher teaches the radicals that frequently appear in Chinese because memorizing them will help students remember other Chinese characters quickly. For example, in learning the word "妈妈" (Māma: mother), we remembered the radical "女": used to refer to a girl, a woman. In

this way, when learning the words like: 妹妹 (Mèimei: younger sister), 姐姐 (Jiějie: elder sister), etc., we can memorize them faster, because all these words have the radical "女", and they are related to girls and women.]

#3 "Em thấy phần dạy chữ Hán trên lớp rất thú vị, giáo viên hay gợi ý để cho chúng tôi dễ nhớ bài." [I think the Chinese character teaching part in the class is very interesting. The teacher often gives suggestions to help us remember the text.]

#4 "cũng tốt. Nhưng tôi nghĩ nên vẽ cho mỗi từ một câu chuyện thì sẽ dễ nhớ, giúp sinh viên có thêm hứng thú, động lực học tiếng Trung VD: 学校 thì có thể nói là: Trường học là nơi được làm bằng gỗ, ba là người đứng đầu." [Well enough. But I think it is better to make up a story for each word, which is easy to remember, more attractive to students, and makes us more motivated to learn Chinese. For example, 学校 can be said like this: A school is a place made of wood, and the father is the pillar.]

#5 "Do đó, giáo viên cần liên tưởng những hình ảnh dễ nhớ để giải thích từ mới giúp học sinh dễ hiểu và cũng dễ nhớ. Ví dụ chữ "吃" có nghĩa là ăn, bạn có thể tưởng tượng bộ Khẩu 口 là cái miệng , thức ăn đưa vào miệng và xuống dạ dày có hình thù giống bộ Ất 乙"
[Therefore, the teacher needs to combine pictures to explain new words to help students understand and remember. For example, the Chinese character "吃" means to eat, and you can imagine that "口" is the mouth, and the shape of the food entering the mouth and down to the stomach is like the character "乙".]

#6 "Mình thấy cách dạy kiểu thế rất sáng tạo và dễ nhớ. Ví dụ chữ 拿 được kết hợp giữa bộ

hợp và bộ thủ. Chữ này có nghĩa là cầm lấy. Giáo viên đã gợi ý thông qua một câu nói rằng "Cái gì cảm thấy phù hợp thì cầm lấy mà đem đi". Tôi cảm thấy học kiểu vậy nhớ khá lâu." [I think this teaching method is very creative and easy to remember. For example, the Chinese character "拿" is a combination of "合" and "手". It means to take. The teacher explained it in one sentence: "Just take it with your hands when you feel it is suitable". I think learning like this can be remembered for a long time.]

Another difference lies in the perspectives of the teaching time. Although both CHL and non-CHL learners believed that learning Chinese characters takes a lot of time, they held different positions. Generally, CHL students assumed that the limited class time constrained them to learn more Chinese characters, and they usually spent a lot of time self-learning at home. In contrast, non-CHL students thought Chinese character instruction in class was very complex and time-consuming. Some students' views are shared below.

Limited class time and self-learning (CHL learners)

#1 "很喜歡寫漢字，但是課堂上不用花了太多時間教寫漢字因為每一堂課很少時間，所以用那段重要的時間學習其他的。寫漢字回家可以慢慢練習，課堂上可以教怎麼寫即可。" [(I) like writing Chinese characters. But (the instructor) does not need to spend too much time teaching how to write Chinese characters in class because there is very little time in each class, so we use that important time to learn other things. Writing Chinese characters can be practiced slowly at home. (The instructor) only needs to teach how to write in class.]

#2 "我觉得课堂上的汉字教学部分比较少，比如一个词，老师有的时候会忽略详细地

解释构成它的每一个字。我认为掌握每个汉字的本身意义对学习汉语有很大的作用。” [I feel that teaching Chinese characters in the classroom is relatively small. For example, when teaching a word, the teacher sometimes ignores explaining each character that constitutes it in detail. I think mastering the meaning of each Chinese character has a great effect on learning Chinese.]

#3 “汉字教学部分比较少（主要是在家里自学，因为时间的原因）。大一时，老师会给我们写很多汉字（用来记汉字），但是对几个人可能是无效的，因为他们还没能把那些字应用到生活中就很难记得它的写法以及读音。” [The teaching of Chinese characters is relatively small (main self-study at home because of limited time). In the freshman year, the teacher would write us many Chinese characters (to memorize them). Still, it may be ineffective for a few people because it was difficult to remember their writing and pronunciation as they had not yet applied those characters to daily life.]

#4 “由每节课的时间很短，因此老师们无法给我们扩大词汇量。” [Since the time of each class is very short, the teachers cannot give us too many words.]

Complex and time-consuming (Non-CHL learners)

#1 “tôi nghĩ rằng nó rất khó và tốn nhiều thời gian, giáo trình trong lớp nặng nên đồi hỏi học sinh phải dành nhiều thời gian luyện thêm ở nhà nhưng sinh viên vẫn còn rất nhiều môn khác để phải học” [I think it is very difficult and time-consuming. The classes are heavy, and we are required to spend a lot of time practicing at home, but we still have many other courses to learn.]

#2 “Quá nhiều chữ Hán. Trong khi thời gian học trên lớp không quá nhiều để có thể nhớ bài ngay tại lớp. Ví dụ: Trong 1 tuần học 5 tiết, 1 tiết học trên lớp chỉ có 45 phút để vừa học chữ Hán, vừa học ngữ pháp, vừa học phát âm. Vì vậy, phải chia nhỏ thời gian của 5 tiết này để đảm bảo đủ thời gian và kiếm thức mà học sinh cần học. Thời gian đó không đủ cho học sinh ghi nhớ bài viết chữ Hán tại lớp, học sinh phải tập viết chữ Hán khi về nhà mới có thể đảm bảo thuộc những từ mới của bài học ngày hôm đó.” [Too many Chinese characters. There is not much time in class, not enough for us to memorize the text in class. For example, five classes a week, one class is only 45 minutes to learn Chinese characters, grammar and pronunciation. Therefore, it is necessary to divide the time of these five lessons into small blocks to ensure that students have enough time and knowledge to study. The time in class is definitely not enough for students to memorize the text and write Chinese characters. Students must practice writing Chinese characters by themselves after returning home to ensure that they can remember the new words in that day’s lesson.]

#3 “về chữ hán thì đã nói như trên,cần thời gian rất rất nhiều mà 1 ngày chỉ 24 tiếng thôi” [Regarding the Chinese characters mentioned above, it takes a lot of time, but there are only 24 hours in a day.]

#4 “Có rất nhiều chữ hán rất khó nhớ và để viết được học sinh phải tốn thời gian học rất lâu. Nhưng sau 1 thời gian học sinh sẽ quên đi cách viết.” [There are too many Chinese characters that it is difficult to remember. Writing Chinese characters costs a lot of time. It takes a long time to learn, but after a while, students forget how to write.]

4.5.2 Students’ views on Chinese character instruction in textbooks

In terms of students' views on Chinese character instruction in textbooks and workbooks, this section will compare the CHL and non-CHL learners in two aspects: their satisfaction and dissatisfaction with the textbooks. There are also some commonalities and differences.

Firstly, many students were satisfied with their Chinese textbooks in teaching Chinese characters to some extent. Both CHL and non-CHL learners evaluated that their textbooks were suitable for each level and helpful, and some Chinese characters and words were close to life. On the other hand, CHL learners assumed that the content was easy to learn and there were insufficient Chinese characters and words, while non-CHL learners believed that there were abundant Chinese characters and words in textbooks. Some of these perspectives are provided below.

Satisfaction with the textbooks (CHL learners)

#1 "Những chữ Hán trong đấy tương đối đơn giản và dễ hiểu.Chúng bao gồm từ vựng và một số ngữ pháp liên quan đến từ vựng ấy,chúng được viết theo chủ đề nên rất dễ để học." [The Chinese characters (in the textbook) are relatively simple and easy to understand. There are vocabulary and some grammar related to vocabulary. They are all written according to the theme of the text, so it is easy to learn.]

#2 "我觉得课本中的汉字学习部分比较仔细，有词类、拼音、意思，有时候还有使用方法的例如。" [I think the Chinese character learning part in the textbook is relatively careful. There are parts of speech, *pinyin*, meaning, and sometimes examples of how to use them.]

#3 “Phần học Hán tự trong sách giáo khoa được trình bày hợp lý. Ví dụ: sách chia từ vựng thành những chủ đề khác nhau, học xong một chủ đề có thể ghi nhớ được lượng lớn từ vựng và cách dùng của chúng.” [The layouts of the Chinese character learning sections in the textbook are very reasonable. For example, it divides the words into different topics, and after learning each topic, you can remember a lot of words and their uses.]

#4 “Tôi thấy những từ vựng trong đấy rất cơ bản và ngắn gọn, chúng giúp tôi tóm tắt lại những nội dung mà tôi cần phải biết khi học một ngôn ngữ ,những chú thích và ví dụ rất cụ thể, sinh động giúp tôi dễ hiểu và tạo hứng thú khi học tập.” [I think the words in it are very basic and short. It helps me summarize what I need to know when learning the language. The notes and examples are very vivid and specific, easy to understand and make me more interested in learning.]

#5 “Sách giáo khoa và từ vựng rất phù hợp, giúp rèn luyện và ôn tập lại những nội dung đã học. Phần bài tập còn giúp chúng ta nhớ mặt chữ.” [Textbooks and words are well-suited, and they help practice and review what has been learned. The exercise part can also help us memorize Chinese characters.]

Satisfaction with the textbooks (Non-CHL learners)

#1 “Phần Hán tự trong sách giáo khoa có sự phân cấp rất rõ ràng và có dạy từ khó lên dễ nên khả năng tiếp thu của chúng tôi khá ổn. Ví dụ: chúng tôi sẽ được học về các bộ chữ Hnas đơn giản từ 1 nét, 2 nét...đến cấp độ nhiều nét hơn (10 nét, 11 nét)” [The Chinese characters in the textbook are clearly organized, ranging from easy to difficult to teach, so our absorptive

capacity is quite good. For example, we will learn Chinese characters from simple one stroke, two strokes... to more advanced levels (10 strokes, 11 strokes).]

#2 "Hán tự trong sách giáo khoa đi từ dễ đến khó, phù hợp với mỗi trình độ khác nhau sẽ có những khối lượng từ cũng như độ khó của từ phù hợp với trình độ đó." [The Chinese characters in the textbook are from easy to difficult, and there are the level-suitable number and difficulty of the new words in the textbooks of different levels.]

#3 "tôi đang học cuốn Giáo trình Hán ngữ và thấy rất thông dụng, gần gũi dễ ứng dụng vào đời sống hàng ngày." [In the Chinese textbook that I am studying, I think (the Chinese characters and words) are very common in daily life, very close to life, and easy to apply.]

#4 "1. Sách giáo khoa: Hữu ích trong việc học các ký tự và từ Tiếng Trung. Bởi vì sách giáo khoa có từng bài học và mỗi bài học là từng lĩnh vực khác nhau trong cuộc sống sinh hoạt hằng ngày và trong công việc. 2. Sách bài tập: Cũng hữu ích trong việc học các ký tự và từ Tiếng Trung. Khi làm bài tập trong sách bài tập có nhiều bài tập với những từ mới chưa học qua. Việc tra từ điển trong sách bài tập tăng việc nhớ từ mới. Việc phân bổ bài tập cũng hỗ trợ cho việc ghi nhớ cấu trúc ngữ pháp của câu cũng như từ mới" [1. Textbooks: Helps to learn Chinese characters and words. Because the textbook is divided into many chapters, each chapter covers different daily life and work areas. 2. Workbook: Also helpful for learning Chinese characters and words. As you work on the exercises in the workbook, you can learn new words that you have not learned before. Looking up a dictionary while working on a workbook can increase your memory for new words. The typesetting of exercises also helps to remember the grammatical structure of sentences and new words.]

#5 “sách giáo khoa và sách bài tập bổ sung cho e rất nhiều từ mới, kiến thức mới rất đầy đủ. chúng giúp ích cho em có thể bổ sung những kiến thức còn thiếu, giúp em biết viết được nhiều từ hơn” [The textbooks and workbooks have helped me develop a lot of new words, and the knowledge is very comprehensive. They helped me fill in some of my missing knowledge, and with their help, I can write more Chinese characters.]

#6 “nó rất hữu ích cho các bạn mới học như chúng tôi, đầy đủ thông tin, nhiều từ mới, dạy cách viết chữ.” [It is very useful for beginners like us. It is rich in content, has many new words, and teaches how to write Chinese characters.]

Secondly, there is a vast improvement room for Chinese character instruction in textbooks to meet the students’ real needs. A number of CHL and non-CHL learners embraced relatively negative attitudes toward their textbooks. For example, they evaluated that the textbooks were not practical, without Vietnamese translations, and disliked writing Chinese characters. Furthermore, CHL learners emphasized that their textbooks provided an insufficient quantity and simple Chinese characters and words; while non-CHL learners assumed that the Chinese character instruction in textbooks was boring, rigid, unattractive, outdated, and time-consuming. The example views are as follows.

Dissatisfaction with the textbooks (CHL learners)

#1 “书本上一课的呈现比例，除了生词的意思、类型以外没有特别强调词的部分。本人以往希望课本可以多说一下汉字，对于学者来说是一种新鲜感，不会感到枯燥乏味。” [In the presentation ratio of one lesson in the textbook, except for the meaning and type of new words, there is no particular emphasis on the part of the word. I hope there could

be more explanations of Chinese characters in the textbooks, which is a kind of freshness for learners and makes them not feel dull.]

#2 “我觉得大部分课本中的汉字不太好。因为词汇量太少，生词却比较简单。而且，在课本中没提到每个生词的用法。所以我们掌握生词的用法不够，运用不准确。” [I think the Chinese characters in most textbooks are not very good. Because the vocabulary is too small, and the new words are relatively simple. Moreover, the usage of each new word is not mentioned in the textbook. Therefore, we have not mastered the usage of new words enough and used them inaccurately.]

#3 “我个人觉得书本里的生词部分在电视节目方面都用不上。书本里的汉字部分有时候不充足，还缺少很多我不认识的词语。” [Personally, I do not think the new words in the textbooks are useable in TV shows. The Chinese characters in the textbooks are sometimes insufficient, and there are lacking many words that I do not know.]

#4 “Trong sách giao khoa nhiều lúc có những từ rất ít gặp và có ứng dụng khá ít. Hoặc có thể có những từ khá đơn giản lại được nhắc đi nhắc lại nhiều lần không cần thiết.” [In textbooks, words that are rarely encountered and have little practical application often appear, or there may be some very simple words being repeated over and over again.]

#5 “我觉得不太好。对我来说，教材和练习册比较简单。我经常上网自学生词。” [I do not feel good. For me, the textbooks and workbooks are relatively simple. I often learn new words on the Internet by myself.]

#6 “Ít yêu thích nhất là viết (vì khó nhớ, viết sai, viết không đúng từ)” [The least favorite is writing Chinese characters (because it is hard to remember, misspelled, and the words do not match).]

#7 “Phần học hán tự trong sách giáo khoa đối với em không hề thích vì không có tiếng việt chỉ toàn tiếng trung và tiếng anh như v không phù hợp với những bạn không giỏi tiếng trung và tiếng anh” [The part of learning Chinese characters in the textbooks is not suitable for me because there is no Vietnamese, only Chinese and English, and it is not suitable for people who are not good at Chinese and English.]

Dissatisfaction with the textbooks (Non-CHL learners)

#1 “Từ mới chữ Hán trong sách giáo khoa đi theo 1 khuôn khổ, không có những chữ sử dụng hằng ngày trong công việc khi đi làm việc phát sinh. Ngoài ra, từ mới cũng không có tiếng lóng trong tiếng Trung.” [The new words in the textbooks are too rigid, and there are no new words that can be used in daily work. Moreover, there are no related slang words for the new Chinese words.]

#2 “Hán tự trong sách giáo khoa thì hơi hạn chế về phần viết, thường em cần hỗ trợ thì các app dạy viết chữ Hán nếu đó là từ quá phức tạp. Và thường thì không có giải thích ý nghĩa của từ cụ thể, trong giáo trình qua các bài chỉ đơn giản có 1 cột chữ Hán, và các cột nghĩa theo tiếng Anh và cột pinyin. Sách thiếu hình ảnh, và em cảm thấy nếu chỉ học trong sách thì khá khô khan. Nên khi học theo trong sách giáo khoa em phải cần nhiều hỗ trợ trên internet.” [There are restrictions on Chinese character writing in the textbook. If the words are too complicated, I often need to use the Chinese character writing app. And often, there is no

explanation of the word's specific meaning, and there is only a column of Chinese characters in the textbook, followed by the English annotation and *pinyin*. The textbook lacks pictures, and I think it is boring to study only through textbooks. So, when I follow the textbooks to study, I need help from the Internet.]

#3 "Phần dạy Hán tự trong sách giáo khoa rất khô khan, đa phần không có phần giải thích ý nghĩa cấu tạo từ khiến cho quá trình ghi nhớ tốn rất nhiều thời gian." [The Chinese character instruction part in the textbook is very dull, and most of them do not explain the structure, composition and meaning of the characters and words. The recitation process takes a lot of time.]

#4 "Cũng khá ổn ở giai đoạn vừa học nhưng sau đó tôi sẽ quên khá nhiều vì nội dung không ấn tượng lắm. Một số sách giáo khoa tôi được học hơi bị lạc hậu so với những kiến thức thời nay." [It was ok when I first started learning, but I forgot a lot later because the content was not attractive. Some of the materials I have learned are a bit outdated compared to the current knowledge.]

#5 "Chưa có tính thực dụng cao -Thiếu tính thực thế -Bài tập quá hàn lâm -Tính khả năng hữu ích cho việc học các ký tự chỉ mang tính tương đối." [The practicality is not high - the practice is lacking - the exercises are too esoteric - and the possibility of being beneficial to Chinese character and word learning is only relative.]

#6 "Hán tự rất khó học với tôi, tôi k thích viết chữ chút nào vì chữ tôi rất tệ. Nhưng k thể biết đọc mà k biết viết đc nên tôi sẽ cố gắng nhiều hơn." [Chinese characters are hard for me to learn. I don't like to write Chinese characters at all because my writing is ugly. But if I cannot

read, I cannot write, so I will work harder.]

#7 “Sách có phần dịch bằng tiếng anh, dịch thì vẫn ổn nhưng có vài từ tiếng anh k biết nên sách nên dịch bằng tiếng việt” [There are English translations in the textbooks, which are very good, but there are some English words I do not know, so it would be better to translate them into Vietnamese.]

4.6 Chapter summary

This chapter reports the statistical results of the Chinese character reading tests, L2 Chinese learning motivation, the frequency of attending extracurricular Chinese activities, and their relationships, among the CHL and non-CHL participants. Also, this chapter reports the main findings from some students’ views on the Chinese character instruction in class and textbooks.

Firstly, in the two Chinese character reading tests, at the elementary Chinese level, the CHL and non-CHL learners had no differences, but at the intermediate and advanced Chinese level, the CHL learners had significant higher scores than non-CHL learners. Moreover, for the two groups, the score of the students at advanced Chinese level was significantly higher than those at intermediate level, and the score of the learners at intermediate level was higher than those at elementary level. And the two-character word reading accuracy was significantly higher than the single character reading accuracy for both the CHL and non-CHL learners. In addition, the test results of the Chinese characters and words suggest that

the structures, number of strokes, types of character formation, graded level, and the number of topics had some different effects on the Chinese character reading achievement of the CHL and non-CHL learners at different Chinese levels.

Secondly, the average motivation of the CHL learners was significantly higher than the average motivation of non-CHL learners. And for the two groups, there were no differences among the average motivation of the learners at the elementary, intermediate, and advanced Chinese level. Furthermore, the average frequency to attend extracurricular Chinese activities of CHL learners was significantly higher than the average frequency of non-CHL learners. Also, the average frequency of the elementary Chinese learners was significantly lower than the average frequency of the intermediate and advanced learners, but there was no difference between the intermediate and advanced Chinese learners. In addition, for both groups, the learners with higher L2 Chinese learning motivation and after-class Chinese activity engagement frequency had better Chinese character reading achievement, and the students with higher motivation in learning Chinese generally had a higher frequency of attending extracurricular Chinese activities. Also, the L2 Chinese learning motivation could significantly predict the CHL and non-CHL learners' Chinese character reading achievement through the mediating effect of the after-class Chinese engagement frequency. The relationships among the reading score, motivation, and frequency of the non-CHL learners were relatively stronger than CHL learners.

Thirdly, in the qualitative analysis, in terms of the perspectives on Chinese character instruction in class, the commonalities between the two groups were that they both attached great importance to the Chinese instructor's teaching charm and believed it was very helpful when the Chinese characters and words are close to their life. On the other hand, the CHL and

non-CHL learners held different views about the fascination of teaching content and the teaching time. Additionally, in terms of students' views on Chinese character instruction in textbooks and workbooks, there were also some commonalities and differences in the CHL and non-CHL learners' satisfaction and dissatisfaction with the textbooks.

Overall, the results and findings show the readers commonalities and differences in Chinese character reading development between adult CHL and non-CHL learners.

Chapter 5: Discussion and Conclusion

5.1 Chapter introduction

This chapter will discuss the research findings in three sections (5.2, 5.3, & 5.4) and suggest some pedagogical implications for Chinese character teaching and learning among CHL and non-CHL learners. At the end, I will give a general conclusion, the study limitations, and some suggestions for future research.

Section 5.2 first reviews the quantitative results of the Chinese character reading test, and then gives explanation for each result in accordance with L2 Chinese character acquisition theories, comparing with relevant studies, and discuss the reasons for unexpected results. In a similar way, section 5.3 summarizes the quantitative results of the relationships between L2MSS components, frequency of after-class Chinese activity engagement, and Chinese character reading achievement. And it then gives explanation for each result based on second language learning theories and comparisons with previous studies. Section 5.4 discusses the CHL and non-CHL learners' perceptions of Chinese character instruction in their class and textbooks and the rationale behind the phenomena, and then analyzes the qualitative results with the quantitative results. In section 5.5, I propose some pedagogical implications for overseas Chinese character teaching and learning among CHL and non-CHL learners based upon the research findings, with the practical operation or examples. Finally, section 5.6 concludes with the overall study background, research questions, methodology, main findings, and significance. It then indicates the limitations of this study (in terms of the data collection methods, cross-sectional design, unaddressed or controversial issues, etc.), and

make suggestions for future research (with respect to some outstanding problems and the research design).

5.2 The development of Chinese character recognition among CHL and non-CHL learners

5.2.1 Comparisons of Chinese character reading achievement between CHL and non-CHL learners

In general, the statistical analysis of the character reading test showed that CHL learners and non-CHL learners had no differences at the elementary Chinese level, but CHL learners significantly obtained higher scores than non-CHL learners at the intermediate and advanced Chinese level. In other words, the two groups of learners had same performance when identifying the single Chinese characters and two-character words, and they both received a relatively low score. The mean total score of elementary CHL students was 45.52 (SD= 15.01), while the mean total score of elementary non-CHL students was 44.71 (SD= 20.04). The participants of elementary level had just completed Chinese *pinyin* lessons and learned some daily topics during the data collection period. It suggests that the CHL and non-CHL learners might have equivalent knowledge of Chinese writing system when they start to learn some basic Chinese characters. However, with in-depth learning of Chinese characters, the differences between them started to appear. The findings suggest that CHL learners improved dramatically and gained significantly higher scores than non-CHL learners in the Chinese

character and word reading tests. At the intermediate Chinese level, the mean total score of elementary CHL students was 115.20 (SD= 28.11), while the mean total score of elementary non-CHL students was 88.71 (SD= 14.42). At the advanced Chinese level, the mean total score of elementary CHL students was 153.67 (SD= 21.00), while the mean total score of elementary non-CHL students was 131.40 (SD= 20.11).

This finding is consistent with the previous studies to some extent (i.e., Chen, 2019; Cheng, 2020; J. Zhang, 2016). In Chen (2019)'s study, the CHL and non-CHL learners did not perform differently in identifying and analyzing the radicals of compound characters at the third week of their Chinese course, but the CHL learners outperformed their non-CHL peers in such tasks at the eighth and fifteenth week. The ability to identify and analyze semantic radicals could be seen as one ability to recognize the orthography and meaning of Chinese characters. In other words, CHL learners' radical knowledge improved more significantly than non-CHL learners over time. However, Chen (2019) found that, from the beginning to end of the research period, the CHL learners always performed better in the radical manipulation task, in which the participants were asked to make real compound characters using the assigned radicals and single characters. As these semantic radicals and single characters are very common and simple in Chinese, such as "艹(a radical referring to something related to plants)", "亻 (a radical referring to someone or something related to person)", "木 (a radical or single Chinese character referring to wood)", "女 (a radical or single Chinese character referring to female)", the CHL learners were more likely to get familiar with them in their family contexts than non-CHL learners. Also, the total number of the radicals and single characters were small (20 items) in this task, and if the CHL learners already knew them, then their advantages would appear at the beginning. Furthermore, in two studies of investigating Chinese orthographic awareness, Cheng (2020) found that the CHL

learners had a better Chinese orthographic knowledge than non-CHL learners to some extent in a character decision task. The master of such knowledge can enhance the ability to recognize Chinese characters and further boost Chinese reading comprehension (Hao & Zhou, 2019; Lin et al., 2019). Although the participants in her study were elementary Chinese learners, both CHL and non-CHL students had Chinese classes for about one semester, which means they had learned a number of Chinese characters of daily topics when the data was collected. In other words, the better performance of CHL learners in identifying the legal characters might occur with the progress of learning. The CHL learners tended to be more sensitive to the structure and component position of Chinese characters than non-CHL learners. In another study of character judgment experiment, J. Zhang (2016) revealed that the CHL learners had better orthographic awareness of left-right structured characters than non-CHL learners at the elementary level and had better orthographic awareness of top-down structured characters at the intermediate Chinese level. She also indicated that the CHL learners further developed an awareness of character components, while the non-CHL learners' awareness of character components was unclear, at the upper elementary and intermediate stage. Likewise, the elementary learners had Chinese courses for about half a year in her study, which means that they had learned some Chinese characters in class already. This is different from the situation of the elementary participants in my study, in which both CHL and non-CHL learners had learned Chinese for one month and they just finished learning Chinese *pinyin* and some daily words.

In short, the first main finding is that the CHL and non-CHL learners performed differently in L2 Chinese character reading achievement when they had learned Chinese for a period of time, despite they both gained same low scores in recognizing Chinese characters at the initial stage. Several reasons are being discussed below to explain such findings.

Firstly, the continuous relatively high motivation spurred CHL learners to put intentional efforts into learning Chinese characters. At the beginning of encountering Chinese characters, most L2 learners felt struggle with such written scripts, thus both CHL and non-CHL learners did not remember many characters which led to their poor performance in the reading tests. When they learned more difficult and complex Chinese characters, they need to spend more time memorizing and practicing them. If they lacked sufficient motivation to pursue learning, they would be more likely to give up remembering such a great number of Chinese characters. The overall Mandarin learning motivation of the CHL learners was higher than non-CHL learners to some extent in this study, which could be one reason to explain the later discrepancies in Chinese character reading achievement between the two groups. Some scholars have indicated such an argument in previous studies but did not provide empirical evidence to support it. Section 5.3 will discuss the comparisons of their motivation and the relationship with L2 achievement in details.

Secondly, the CHL learners had relatively more opportunities to be exposed to aural-oral and print Chinese in their surroundings, which could explain why they experienced greater improvement than non-CHL learners along with the growth of the learning time. For one thing, the early exposure to Chinese listening and speaking experience could facilitate the CHL learners' later study of print Chinese (Chen, 2019; Zhang & Koda, 2018, 2021). Specifically, the CHL learners might accumulate many mental lexicons in interactions with their Chinese family members or relatives, consciously or unconsciously. Later on, when they start to take formal Chinese lessons at schools, they could be more efficiently in connecting the character forms with the pronunciation in mind. This might be one reason to explain their rapid progress in reading Chinese characters and words. For another thing, although the CHL

and non-CHL learners received the same Chinese character instruction in class, the CHL learners could have more opportunities to encounter oral and print Chinese after class, such as chatting with family members, contacting Chinese relatives, watching Chinese TV programs, listening to Chinese music, visiting the China town, reading Chinese materials, and writing Chinese characters, etc. According to the Usage-based theory in SLA, the exposure to input plays a vital role in L2 acquisition, and incidental learning often happens in L2 acquisition, though such approaches are confined to learners' attention to L2 input (Ellis & Wulff, 2020). The more frequently the learners have access to Chinese language resources, the more likely they would be familiar to Chinese writing specificity. Although some non-CHL learners may also spend more time practicing Chinese after class, it will take them huge motivation to persist as they are not living in a Chinese related context and need to intentionally create such conditions through multifarious learning resources, compared with the CHL learners. Otherwise, the non-CHL learners generally have less frequency of engaging in extracurricular Chinese activities. It would take them longer time to get familiar with the Chinese writing system, building connections between the oral and print Chinese. Section 5.3 will support this point of view with some statistical evidence.

Thirdly, the relatively more positive attitudes towards and experiences in learning Chinese characters in class and textbooks may help CHL learners accumulate more character knowledge than non-CHL learners. It is possible that some CHL learners have been aware of the importance of Chinese characters in learning this language since they were young due to their family influence. Albeit they may also feel anxious and difficult in learning Chinese characters, they were inclined to face the challenges with positive attitudes and confidence, and they seemed to show more interest in knowing the history and culture behind Chinese characters, which may help them get great improvement in learning Chinese characters. Their

confidence was boosted as they accumulated more and more characters. By contrast, it seems that the non-CHL learners did not realize the significant role of Chinese characters at the beginning of learning this language, and they preferred to pay more attention to communication skills. Likewise, they felt anxious and difficult in memorizing Chinese characters, but they preferred to learn characters by creating interesting stories instead of focusing on the internal structure and regularities of Chinese characters. It may impede them from accumulating many complex Chinese characters. After all, the number of pictographs and the characters of meaning transparent is limited. More discussions on this argument will be presented in Section 5.4.

To summarize briefly herein, there was no significant differences in L2 Chinese character reading achievement between the Vietnamese CHL and non-CHL learners at the beginning, but the CHL learners improved dramatically and outperformed in Chinese character reading tests than non-CHL learners at the intermediate and advanced stage. The differences of L2 Chinese learning motivation, early exposure to Chinese and extracurricular Chinese engagement, as well as the learning attitudes and experiences, may explain this research finding. The detailed discussions can be seen in the following sections.

5.2.2 Comparisons among the reading achievement of different types of Chinese characters between CHL and non-CHL learners

In addition to the overall comparisons of the Chinese character reading achievement between the two groups of learners, we need to scrutinize the specific learning achievement in each type of Chinese characters and words among CHL and non-CHL learners.

Firstly, our test results showed that for both CHL and non-CHL learners, the accuracy of the two-character word test was significantly higher than the accuracy of the single character reading test. For the CHL learners, their mean accuracy of the single character and word test was 49.65% (SD= .23) and 53.52% (SD= .27) respectively. For the non-CHL learners, their mean accuracy of the single character and word test was 40.22% (SD= .18) and 45.55% (SD= .22) respectively. It suggests that the two groups of students had better achievement in recognizing Chinese words than the sole characters. In other words, the CHL and non-CHL participants could recognize more two-character words than single Chinese characters in both pronunciation and meaning.

One reason might be that naturally, the quantity of Chinese words with two or more characters (65%) is more than the total of single-character words (35%) in modern Chinese, according to *Modern Chinese Frequency Dictionary* (1986). Therefore, the learners might be more familiar with reading the two-character words as these words are saturated in modern Chinese people's daily life. For both CHL and non-CHL learners, the two-character words appear more frequently in their various learning resources.

Another possible explanation could be that learning words in collocation (with context) is easier than in isolation (without context). There is vast literature on English vocabulary learning supporting this view (e.g., Bui, 2021; Duan & Qin, 2012; Lewis et al., 2000, etc.). In this study, both CHL and non-CHL learners learned Chinese characters in the topic words from each lesson, thus they might have a deeper impression on words than the single characters. In practice, the teacher mainly introduced the Chinese words in class and spent more time on communication skills (such as practicing the conversation in texts or making

the sentences with the learned vocabulary and grammar). Due to the limited class time, many teachers only teach the students how to write Chinese characters and then ask them to write characters after class. Moreover, the contents in their Chinese textbooks are organized for the learners to focus on the words in every topic lesson rather than the character knowledge.

In addition, in the Chinese character reading test, some students made mistakes by misidentifying one character to another in a word, for example, they identified "疾 /jí/ [illness]" as "病 /bìng/ [illness]" in the word "疾病 /jí bìng/ [disease]". And some students could recognize the two-character word but failed in reading one single character of that word. For example, they could correctly read the word "周末 /zhōu mò/ [weekend]" but failed to recognize the single character "末 /mò/ [end]". Such phenomena occurred in both CHL and non-CHL groups. This finding is consistent with some previous studies on Chinese children's reading development that they gained significantly higher in reading the Chinese character within a word than reading it alone (Li et al., 2017; Wang & McBride, 2016). Recent psychological studies suggest that different cognitive-linguistic processes might be involved in the single Chinese character reading and two-character word reading (Pan et al., 2021; Yang et al., 2022). Reading the single Chinese characters may need more visual-orthographic awareness as more attention may go to the internal character structure and the component position regularities (McBride, 2016). By contrast, reading the two-character words may need more morphological awareness as more attention might be paid to the lexical compounding (Pan et al., 2021). In short, the learners are prone to treat the single Chinese character reading as an analytic process whereas to use holistic skills in reading the two-character vocabulary.

Secondly, there might exist some regular trajectory in reading Chinese characters and words among CHL and non-CHL learners. The following six paragraphs will illustrate the situation of the CHL and non-CHL learners at each Chinese proficiency level.

For the elementary CHL learners, they had significantly better achievement in reading the elementary Chinese characters (e.g., 月/yuè/ [moon, month], 下/xià/ [below], 请/qǐng/ [please], 花/huā/ [flower], 国/guó/ [country]) than the intermediate and advanced characters. They gained both low accuracy in recognizing the intermediate (e.g., 尺/chǐ/ [ruler], 订/dìng/ [subscribe], 酱/jiàng/ [sauce], 返/fǎn/ [return]) and advanced (e.g., 匆/cōng/ [hurriedly], 酥/sū/ [crisp], 灸/jiǔ/ [acupuncture], 疲/pí/ [tired]) Chinese characters. Moreover, the elementary CHL learners had the same achievement in reading the pictographs and self-explanatory characters, and the same achievement in associative compounds and phonograms. In other words, the elementary CHL learners might not distinguish the different types of Chinese character formation and gained relatively low scores in reading each type of characters. It suggests that the CHL learners did not grasp the knowledge of character formation at the beginning stage of learning Chinese characters. However, the elementary CHL learners had some knowledge about the Chinese character structure but seemed to be unclear at this stage. They performed better in reading the compound characters of top-down structure than the (half)surrounded characters, but no differences were found between the left-right and top-down structured characters, as well as the left-right and (half)surrounded characters. Furthermore, the elementary CHL learners received significantly greater achievement in recognizing the elementary Chinese characters with fewer number of strokes (under nine strokes) than the characters with many strokes. It illustrates that the CHL learners felt it easier to process the Chinese characters with less visual complexity as they acquired

simple characters before those complex ones.

In addition, when reading the two-character words, the elementary CHL learners were affected by the word level and the number of topics containing that word. Specifically, they had significantly better achievement in reading the elementary words (e.g., 高兴/gāo xìng/ [happy], 喜欢/xǐ huan/ [like], 知道/zhī dao/ [know]) than the intermediate (e.g., 堵车/dǔ chē/ [traffic jam], 抱怨/bào yuàn/ [complain], 锻炼/duàn liàn/ [take exercise]) and advanced (e.g., 萝卜/luó bo/ [radish], 推荐/tuī jiàn/ [recommend], 公寓/gōng yù/ [apartment]) words but gained similar achievement in identifying the intermediate and advanced words. It was the same situation as in reading the single Chinese characters. Moreover, they had significantly better performance in reading the elementary words of many topics (e.g., 高兴/gāo xìng/ [happy], 星期/xīng qī/ [week], 电话/diàn huà/ [phone]) than the elementary words of medium and few topics (e.g., 健康/jiàn kāng/ [health], 观察/guān chá/ [observe], 司机/sī jī/ [driver]). And they gained higher achievement in reading the intermediate words of many and medium topics (e.g., 兴趣/xìng qù/ [interest], 饭馆/fàn guǎn/ [restaurant], 图片/tú piàn/ [picture]) than the intermediate words of few topics (e.g., 打折/dǎ zhé/ [discount], 辞职/cí zhí/ [resign], 抱怨/bào yuàn/ [complain]). This finding demonstrates that the elementary CHL learners had better learning achievement in reading those Chinese characters to which they had a high frequency of exposure, no matter in Chinese class, textbooks, or daily activities.

For the elementary non-CHL learners, they had significantly better achievement in reading the elementary Chinese characters than the intermediate and advanced characters, but they gained the same achievement with both low accuracy in recognizing the intermediate and

advanced Chinese characters. This was the same as elementary CHL learners. However, the elementary non-CHL learners received significantly higher scores in reading the pictographs than the self-explanatory characters but obtained the same achievement in reading the associative compounds and phonograms. In other words, the elementary non-CHL learners were impressed by the pictographs at the beginning of learning Chinese characters, but they could not distinguish the different types of Chinese characters and gained low scores in reading self-explanatory characters, associative compounds, and phonograms. Also, the elementary non-CHL learners showed unclear knowledge about the Chinese character structure at the beginning stage. Although they performed better in reading the top-down structured characters than the (half)surrounded characters, they did not perform differently in recognizing the left-right and top-down structured characters, as well as the left-right and (half)surrounded characters. Furthermore, the elementary non-CHL learners gained significantly superior achievement in reading the elementary Chinese characters with fewer number of strokes (under nine strokes) than the characters with many strokes. It suggests that the non-CHL learners felt it easier to identify the Chinese characters with less visual complexity as they learned simple characters before the complex ones.

In addition, when reading the two-character words, the elementary non-CHL learners were affected by the word level and the number of topics containing that word. Specifically, they had significantly better achievement in reading the elementary words of many topics than the elementary words of medium and few topics and gained significantly higher scores in reading the intermediate words of many and medium topics than the intermediate words of few topics. But their reading accuracy was very low in advanced words, no matter the number of topics contained. This finding reveals that the elementary non-CHL learners had significantly better achievement in reading the elementary Chinese characters with many topics which

frequently appear in their Chinese class and textbooks, or other learning resources.

For the intermediate CHL learners, they had significantly better achievement in reading the elementary Chinese characters than the intermediate characters, and they gained higher achievement in recognizing the intermediate characters than the advanced Chinese characters. At the intermediate level, the CHL learners made greater progress in reading the intermediate Chinese characters, thus the differences between the intermediate and advanced characters appeared. Moreover, the intermediate CHL learners had significantly higher scores in reading pictographs than self-explanatory characters and gained better achievement in recognizing phonograms than associative compounds. In other words, the CHL learners realized the different types of Chinese characters and found it easier to process the pictographs and phonograms at the intermediate stage of learning Chinese characters. Additionally, the character structure knowledge of the intermediate CHL learners seemed to develop synchronously at this stage. They received the same achievement in reading the compound characters of left-right, top-down, and the (half)surrounded structure. Likewise, the intermediate CHL learners had the same achievement in reading the Chinese characters with fewer number of strokes and the characters with many strokes. It implies that the CHL learners might not be confined to the number of strokes at the intermediate level after they accumulated a number of simple and complex Chinese characters.

Furthermore, when reading the two-character words, the intermediate CHL learners were influenced by the word level and the number of topics containing that word. Specifically, they performed significantly better in reading the elementary words than the intermediate and advanced words and had better achievement in identifying the intermediate words than advanced words. It was the same situation as in reading the single Chinese characters. Also,

they had significantly better performance in reading the two-character words of many topics than the words of medium and few topics and gained higher scores in reading the words of medium topics than the words of few topics. This finding suggests that the CHL learners obtained better learning achievement in reading the Chinese characters to which they had a high frequency of exposure and great improvement at the intermediate stage.

For the intermediate non-CHL learners, they had significantly better achievement in reading the elementary Chinese characters than the intermediate characters and gained better achievement in recognizing the intermediate than advanced Chinese characters. It suggests that they got great improvement in reading the intermediate Chinese characters at this stage. Moreover, the intermediate non-CHL learners had the same performance in reading the pictographs and self-explanatory characters but obtained significantly higher scores in reading the phonograms than associative compounds. In other words, the intermediate non-CHL learners made progress in learning the different types of Chinese characters and acquired some knowledge about the self-explanatory characters and phonograms. Besides, their character structure knowledge seemed to develop synchronously at the intermediate stage. They had the same achievement in reading the compound characters of left-right, top-down, and the (half)surrounded structure. Furthermore, the intermediate non-CHL learners had significantly better attainment in reading the Chinese characters with fewer number of strokes (under nine strokes) than the characters with many strokes. It suggests that the non-CHL learners were still affected by the visual complexity within the Chinese characters.

Additionally, the intermediate non-CHL learners were also influenced by the word level and the number of topics containing that word when reading the two-character words. To be specific, they had significantly better achievement in reading the elementary words of many

and medium topics than the elementary of few topics, and they gained significantly higher scores in reading the intermediate and advanced words of medium topics than the intermediate and advanced of few topics. This finding discloses that the intermediate non-CHL learners gained improvement in reading the intermediate and advanced words and had significantly better achievement in learning the Chinese characters that frequently appear in their Chinese learning context.

For the advanced CHL learners, they achieved significantly better attainment in reading the elementary single-component characters than the intermediate and advanced ones, but they had the same achievement in recognizing the intermediate and advanced single-component characters as they learned more complex characters at this stage. However, the advanced CHL learners received significantly higher scores in identifying the elementary compound characters than the intermediate compounds and had better achievement in reading the intermediate compounds than the advanced ones. Moreover, the advanced CHL learners gained the same achievement in reading the pictographs and self-explanatory characters but performed significantly better in recognizing the phonograms than associative compounds. In other words, the advanced CHL learners made progress in reading the self-explanatory characters and could have little difficulty in memorizing the single-component characters, but they still found it easier to process the phonograms than associative compounds, especially among the characters of many strokes. Furthermore, the advanced CHL learners were not confined to the different Chinese character structures to a large extent at this stage. They had similar achievement in reading the compound characters of left-right, top-down, and the (half)surrounded structure. Likewise, the advanced CHL learners gained the same achievement in reading the Chinese characters with fewer number of strokes and the characters with many strokes. It indicates that the advanced CHL learners were not affected

by the number of strokes as they had accumulated many compound characters already.

In addition, the advanced CHL learners were still influenced by the word level and the number of topics containing that word when reading the two-character words. Specifically, they showed significantly better performance in reading the elementary words than the intermediate and advanced words and had better achievement in recognizing the intermediate words than advanced words. Besides, they gained significantly higher accuracy in reading the two-character words of many topics than the words of medium and few topics and got better achievement in reading the words of medium topics than the words of few topics. This finding suggests that the CHL learners achieved greater learning attainment in recognizing the Chinese characters to which they had a high frequency of exposure and made continuous progress at the advanced stage.

For the advanced non-CHL learners, they had significantly better achievement in reading the elementary Chinese characters than the intermediate characters and achieved better attainment in recognizing the intermediate characters than advanced Chinese characters. This result suggests that the lower grade the Chinese characters belong to, the better reading achievement they can obtain at the advanced stage. Moreover, the advanced non-CHL learners had the same achievement in reading the pictographs and self-explanatory characters but obtained significantly higher accuracy in recognizing the phonograms than associative compounds. In other words, the advanced non-CHL learners made progress in learning the different types of Chinese characters. They may have little difficulty in memorizing the pictographs and self-explanatory characters and still felt it easier to process the phonograms than associative compounds (especially among the advanced Chinese characters). Likewise, the advanced non-CHL learners were not confined to the different character structures and

gained the same achievement in reading the compound characters of left-right, top-down, and the (half)surrounded structure. Furthermore, the advanced non-CHL learners made great progress in learning the Chinese characters of many strokes and achieved the same attainment in reading the characters with fewer number of strokes and the characters with many strokes. It implies that the non-CHL learners seemed not to be affected by the visual complexity within the Chinese characters at the advanced stage.

In addition, the advanced non-CHL learners were still influenced by the word level and the number of topics containing that word when reading the two-character words. To be specific, they had significantly better achievement in reading the elementary words than intermediate and advanced words, and they gained significantly higher accuracy in reading the intermediate words than the advanced ones. Also, they performed significantly better in reading the words of many topics than the words of medium and few topics, and they obtained significantly higher accuracy in reading the words of medium topics than the words of few topics. This finding discloses that the non-CHL learners gained significantly better reading achievement among the Chinese characters to which they had a high frequency of exposure and made continuous progress at the advanced stage.

To make it clear and concise, I summarize the main findings in Table 14 below. From the reading achievement in each type of Chinese characters, we know that there are similarities and differences in the developmental trajectory of Chinese character learning between the CHL and non-CHL learners.

Table 14 The developmental trajectory of Chinese character learning among CHL and non-CHL learners

Group	Chinese Level	Single Chinese Characters	Two-character Words
CHL	Elementary	elementary Chinese characters little knowledge about character formation and structure Chinese characters of few strokes	elementary words words of many topics
	Intermediate	elementary and intermediate Chinese characters pictographs and phonograms structure knowledge develops synchronously Chinese characters of few and many strokes	elementary and intermediate words words of many and medium topics
	Advanced	elementary, intermediate, and advanced Chinese characters develop knowledge about character formation and structure Chinese characters of few and many strokes	elementary, intermediate, and advanced words words of many, medium, and few topics
Non-CHL	Elementary	elementary Chinese characters pictographs little knowledge about character formation and structure Chinese characters of few strokes	elementary words words of many topics
	Intermediate	elementary and intermediate Chinese characters pictographs, self-explanatory characters, and phonograms structure knowledge develops synchronously Chinese characters of few strokes	elementary and intermediate words words of many and medium topics
	Advanced	elementary and intermediate Chinese characters develop knowledge about character formation and structure Chinese characters of few and many strokes	elementary, intermediate, and advanced words words of many, medium, and few topics

Note. This table presents the main findings summarized from the reading achievement in each type of Chinese characters and words.

In general, at the beginning stage of learning Chinese characters, both CHL and non-CHL learners obtained significantly better reading achievement in elementary Chinese characters and two-character words, the characters with fewer strokes, and the words of many topics. It stands to reason that these Chinese characters might be comparatively easier processed and memorized by virtue of their less visual complexity, high frequency, and familiarity with the students. Previous research findings on adult CFL learners have demonstrated such a verdict (e.g., Jiang, 2008; Wang, 2020; Xu, 2010). Overall, such findings are in accordance with the cognitive development in learning a second/ foreign language that the learners are inclined to acquire the simple linguistic form-meaning connections before the complex ones. It could also explain why the CHL and non-CHL learners were not different at the very beginning level.

Moreover, they both had little knowledge about the Chinese character structure (i.e., left-

right, top-down, half-surrounded/surrounded) and formation methods (pictographs, self-explanatory characters, phonograms, associative compounds). This result suggests that the beginning learners tended to conceive a Chinese character as a whole configuration instead of analyzing its internal structure and components. However, we have reservations about the structure effect. Many prior studies suggest that the structural effect could exist in elementary CFL learners' character recognition. Some researchers found a better achievement in reading the characters in the left-right structure (Feng, 2006; Xu, 2010; Zhang, 2017), while some found the advantage of characters in the top-down or surrounded structure (Jiang, 2008; Wang, 2015). The structure effect was not evident in our study probably due to the small sample size in each structural character and the impact of other factors (i.e., the graded level, stroke numbers, formation methods). But with the increase in the number of Chinese characters learned, the structure effect might die away (Lu, 2002; Zhang, 2017). This finding was also found in the Chinese character reading among the intermediate and advanced learners.

On the other hand, it seemed that the non-CHL learners were more impressed by the pictographs and received higher accuracy than reading the self-explanatory characters, while this was not the case in CHL learners. One assumption is that the beginning non-CHL learners might be more sensitive to pictographs (such as "月/yuè/ [moon]", "雨/yǔ/ [rain]") that bear a visual similarity to the real objects rather than the self-explanatory characters (such as "本/běn/ [basis]", "末/mò/ [end]") that have abstract meaning indication. While the CHL learners tended to directly connect the pictographs and self-explanatory characters with their semantic representation, under the home education, they might understand that Chinese characters are not drawings when they first access Chinese writing scripts.

Nevertheless, this was not cast in stone. Some differences seemed to occur between the CHL and non-CHL learners when they reached the intermediate level. One major difference was that the number of character strokes did not affect the CHL learners' reading achievement but still played a role in the reading accuracy of the non-CHL learners. The non-CHL learners felt it easier to memorize the Chinese characters with fewer strokes and thus gained higher scores, but the CHL learners might get rid of the influence of the visual complexity within Chinese characters to some extent and made great progress in reading the simple and complex characters. On the other hand, both the intermediate CHL and non-CHL learners developed the character structural knowledge synchronously. Although the CHL learners obtained significantly higher mean scores, the two groups, respectively, did not perform differently in reading the compound characters of left-right, top-down, and (half)surrounded structures. Moreover, they learned some knowledge about the character formation and found it easier to process the pictographs and phonograms, but the non-CHL learners might not distinguish the pictographs and self-explanatory characters. In general terms, most students might feel less difficulty remembering the pictographs and phonograms, which could be explained by the salient appearance of the pictographs and the large proportion of the phonograms. Furthermore, another commonality was that the two groups of learners made some progress in recognizing the intermediate Chinese characters and words and the words of medium topics, besides the elementary characters and words of many topics.

Furthermore, the situation became a little different when they achieved the advanced Chinese level. All in all, both the CHL and non-CHL learners continued to gain improvement in Chinese character and word reading achievement. For example, they both further developed the knowledge of Chinese character formation and structures and were not affected by the number of strokes, as well as made progress in reading the advanced two-character words and

the words of fewer topics. The insignificant effect of stroke numbers was consistent with the finding in a study by Hao (2018) on advanced CSL learners' Chinese character reading. Moreover, the advanced CHL and non-CHL learners felt less difficult in reading the pictographs, self-explanatory characters, and phonograms than associative compounds. The reasons could be that most pictographs and self-explanatory characters are single-component characters with fewer strokes, and the phonograms account for a large proportion of modern Chinese characters and bear with some phonetic and semantic cues. In contrast, the associative compounds are limited in quantity and cannot provide pronunciation hints. However, the CHL learners also improved in reading the advanced Chinese characters, whereas the non-CHL learners struggled with them at the advanced stage. Overall, the CHL learners improved more dramatically than the non-CHL learners in Chinese character and word reading achievement from the elementary to advanced level.

In addition, the Chinese character reading outcomes have supported the significant effect of the graded level, particularly in two-character word recognition. In this regard, it also supports the configuration of the elementary, intermediate, advanced Chinese characters and words in *Chinese Proficiency Grading Standards for International Chinese Language Education* (2021), which conforms to CSL/CFL learners' learning development routines. Notwithstanding, some Chinese characters and words may need reconsideration. For example, the characters "言 (/yán/ [speech, say])" and "族 (/zú/ [race, clan])" are placed in the elementary group but received comparatively low accuracy in our reading test. Also, the two-character words "观察 (/guān chá/ [observe])" and "继续 (/jì xù/ [continue])" are placed in the elementary group but received comparatively low accuracy in our reading test. However, the words "烤鸭 (/kǎo yā/ [roast duck])" and "钥匙 (/yào shi/ [key])" are placed in the advanced group but gained fairly high accuracy among both CHL and non-CHL

learners. In this sense, if the learners were to attend the new HSK test, they should be familiar with these Chinese characters and words to some extent.

5.3 L2 motivation, frequency, and Chinese character reading achievement among CHL and non-CHL learners

5.3.1 L2 Chinese learning motivation of CHL and non-CHL learners

From the literature review, we have learned that learners' motivation plays a significant role in second/foreign language learning, and the CHL and non-CHL learners have commonalities and differences in L2 Chinese learning motivation. In this study, we compared their Chinese Mandarin learning motivation based on the L2MSS framework under the context of learning Chinese as a foreign and heritage language. The following paragraphs will compare and discuss the CHL and non-CHL learners' motivation in terms of the ideal L2 self, ought-to L2 self, L2 learning experience, family influence, China and Mandarin instrumentality, promotional instrumentality, and intended learning efforts.

In brief, the CHL learners embraced significantly higher Chinese Mandarin learning motivation than non-CHL learners. The average motivation score of the CHL group was 4.68 (SD= .65), while the average motivation score of the non-CHL group was 3.76 (SD= .74). Numbers 1-6 represent the motivation scale from low to high. Specifically, in the CHL group, the mean score of the ideal L2 self, ought-to L2 self, L2 learning experience, family

influence, China and Mandarin instrumentality, promotional instrumentality, and intended effort was 4.96 (SD= .83), 4.22 (SD= 1.05), 5.05 (SD= .69), 3.68 (SD=1.03), 4.76 (SD= .93), 4.93 (SD= .74), and 5.07 (SD= .74) separately. The results suggest that the CHL learners had higher motivation to learn Mandarin mainly from the ideal L2 self, L2 learning experience, China and Mandarin instrumentality, and the promotional instrumentality. Their intended learning efforts were maintained at a relatively high level from the elementary to advanced stages. In contrast, among the non-CHL learners, the mean score of the ideal L2 self, ought-to L2 self, L2 learning experience, family influence, China and Mandarin instrumentality, promotional instrumentality, and intended effort was 4.16 (SD=1.28), 2.80 (SD= .88), 4.57 (SD= .86), 1.78 (SD= .62), 3.71 (SD=1.33), 4.46 (SD= .96), and 4.67 (SD= .91). The results suggest that the non-CHL learners had higher motivation to learn Mandarin mainly from the ideal L2 self, L2 learning experience, and the promotional instrumentality. Their intended learning efforts were maintained at a medium level at the elementary and intermediate stage but promoted to a relatively higher level at the advanced stage. Additionally, the ANOVA results tell us that the CHL and non-CHL learners had major differences in all the motivational orientations. In other words, the CHL learners generally were driven by the desire to become a fluent Chinese user, to meet parents' and teachers' expectations, to get better promotion in career, and were motivated by their learning environment and experience, as well as affected by the rise of China and Mandarin dissemination. By contrast, the non-CHL learners were mainly driven by the desire to become a native-like speaker, to get more job opportunities and better promotion in career, and they were motivated by their learning environment and experience as well (e.g., the influence of the Chinese teacher and curriculum). We found significant differences between the CHL and non-CHL learners in all seven motivational orientations. This was somewhat inconsistent with the findings of Lin (2018), in which there was no significant difference in the motivational factor of China and

Mandarin instrumentality between the heritage and non-heritage learners. In the present study, most non-CHL learners were not motivated by the rising influence of China and Chinese Mandarin to pursue learning Mandarin. In contrast, the CHL learners were encouraged by this factor might be due to their family connections to their ancestral home in China.

On the other hand, the overall average motivation of the CHL learners was not different at the elementary, intermediate, and advanced stages, and neither was it among the non-CHL learners. Specifically, the ANOVA results did not show any significant effect of the different Chinese level in L2 learning experience, family influence, the ought-to L2 self, China and Mandarin instrumentality, and intended efforts. Nevertheless, the mean score of the ideal L2 self was significantly higher in the advanced CHL and non-CHL learners than the elementary learners, but no differences were found between the learners at other Chinese proficiency levels. It suggests that the desire of the CHL and non-CHL learners to become a near native speaker of Chinese was not very strong at the beginning but reached at a relatively high level when the learners at the advanced stage. Also, the effect of Chinese level was found in the motivational component of promotional instrumentality. The result showed that the mean score of the promotional instrumentality was significantly higher in the intermediate and advanced CHL and non-CHL learners than the elementary learners, but no differences were found between the learners at the intermediate and advanced Chinese proficiency level. It suggests that the CHL and non-CHL learners' desire to get more job opportunities and better promotion in career was not very strong at the beginning but increased to a relatively high level when they at the intermediate and advanced Chinese level.

To sum up, one important finding was that the Mandarin learning motivation of the CHL

learners was significantly higher than non-CHL learners, in terms of the ideal L2 self, ought-to L2 self, L2 learning experience, family influence, China and Mandarin instrumentality, promotional instrumentality, and intended learning efforts. Furthermore, the CHL learners had higher Mandarin learning motivation in respect of the ideal L2 self, L2 learning experience, China and Mandarin instrumentality, and the promotional instrumentality, and their intended effort was maintained at a relatively high level from the elementary to advanced stages. However, the non-CHL learners had higher Mandarin learning motivation in respect of the ideal L2 self, L2 learning experience, and the promotional instrumentality. In addition, there was no Chinese level effect in the average motivation of the CHL and non-CHL learners, with respect to L2 learning experience, family influence, the ought-to L2 self, China and Mandarin instrumentality, and intended efforts. On the other hand, the ideal L2 self motivation of the CHL and non-CHL learners was not obvious at the beginning but reached to a relatively high level when the learners at the advanced stage. Likewise, the CHL and non-CHL learners' motivation of promotional instrumentality was not strong at the beginning but increased to a relatively high level when they reached the intermediate and advanced Chinese level. Therefore, we could draw a conclusion that the CHL and non-CHL learners shared commonalities and differences in L2 motivation of Chinese Mandarin, which is consistent with the previous studies (Lin, 2018; Wen, 2011, 2022; Xie, 2014).

5.3.2 Frequency of extracurricular Chinese engagement of CHL and non-CHL learners

From the literature review, we have learned that the frequency of exposure to the target language also plays an important role in second/foreign language learning. The CHL and non-CHL learners are different in terms of their sociocultural context. Thus, their frequency of

exposure to Chinese might be different to some extent. Since the CHL and non-CHL learners received the same formal class instruction in this study, we then compared their extracurricular Chinese engagement frequency as a way of informal learning. The following paragraphs will compare and discuss the CHL and non-CHL learners' after-class Chinese activity engagement frequency in terms of speaking Chinese with family or friends, watching Chinese TV programs, listening to Chinese songs, visiting China town or Chinese market, reading Chinese books, and writing Chinese characters.

In short, the CHL learners had significantly higher frequency of extracurricular Chinese activity engagement than the non-CHL learners. The average frequency score of the CHL group was 3.26 (SD= .75), while the average frequency score of the non-CHL group was 2.76 (SD= .62). Numbers 1-6 represent the frequency level from low to high. Specifically, for the CHL learners, the mean score of speaking Chinese with family or friends, watching Chinese TV programs, listening to Chinese songs, visiting China town or Chinese market, reading Chinese books, and writing Chinese characters was 2.61 (SD= .97), 3.72 (SD= 1.00), 4.24 (SD=1.09), 2.57 (SD=1.29), 2.94 (SD=1.09), and 3.46 (SD= .91) separately. The results revealed that the CHL learners had a relatively higher frequency of watching Chinese TV programs, listening to Chinese songs, reading Chinese books, and writing Chinese characters after class. In contrast, among the non-CHL learners, the mean score of speaking Chinese with family or friends, watching Chinese TV programs, listening to Chinese songs, visiting China town or Chinese market, reading Chinese books, and writing Chinese characters was 1.75 (SD= .78), 3.55 (SD=1.23), 4.02 (SD=1.09), 1.48 (SD= .65), 2.54 (SD=1.03), and 3.24 (SD= .89). The results suggest that the non-CHL learners had a relatively higher frequency of watching Chinese TV programs, listening to Chinese songs, and writing Chinese characters after class. Furthermore, the ANOVA results tell us that the CHL and non-CHL learners had

significant differences in the frequency of speaking Chinese with family or friends, visiting China town or Chinese market, and reading Chinese books. In other words, both the CHL and non-CHL learners sometimes engaged in extracurricular Chinese activities, such as watching Chinese TV programs, listening to Chinese songs, and writing Chinese characters. On the other hand, the CHL learners were more fluently than the non-CHL learners to speak Chinese with family or friends, visit China town or Chinese market, and read Chinese books after class.

In addition, the extracurricular Chinese engagement frequency of the CHL and non-CHL learners was also different at the elementary, intermediate, and advanced stages. Generally, the ANOVA results revealed that the learners' average frequency to attend after-class Chinese activities was relatively low at the beginning stage but increased significantly when they reached the intermediate and advanced Chinese level. To be specific, the mean frequency of the CHL and non-CHL learners at the intermediate and advanced level was significantly higher than the learners at the elementary level in terms of speaking Chinese, listening to Chinese songs, visiting China town or Chinese market, and reading Chinese books. And the intermediate learners' frequency of watching Chinese TV programs was significantly higher than the elementary learners. This finding suggests that both the beginning CHL and non-CHL learners did not have much frequency of exposure to Chinese after class, but the intermediate and advanced learners had more frequent access to Chinese-related activities (except for writing Chinese characters). One explanation could be that the learners mainly relied on the class instruction to learn Chinese when they had little knowledge of this language, and they started to find some informal opportunities to help with their Chinese learning when they achieved a certain proficiency level. As for writing Chinese characters, it was usually assigned as one homework for the CHL and non-CHL learners so that there

might not be significant differences among the learners at different learning stages.

To sum up, one major finding was that the extracurricular Chinese engagement frequency of the CHL learners was significantly higher than non-CHL learners, especially in the frequency of speaking Chinese with family or friends, visiting China town or Chinese market, and reading Chinese books. Furthermore, the CHL learners had a relatively higher frequency of watching Chinese TV programs, listening to Chinese songs, reading Chinese books, and writing Chinese characters after class. By contrast, the non-CHL learners had a relatively higher frequency of watching Chinese TV programs, listening to Chinese songs, and writing Chinese characters after class. In addition, the CHL and non-CHL learners' average frequency to engage in extracurricular Chinese activities was relatively low at the beginning stage but increased significantly when they were at the intermediate and advanced Chinese level, in respect of speaking Chinese, listening to Chinese songs, visiting China town or Chinese market, and reading Chinese books. However, there were no differences among their frequency in writing Chinese characters at different proficiency levels. Overall, we may conclude that the group and Chinese level both had some effects on the research findings, and the CHL and non-CHL learners shared similarities and differences in the frequency of extracurricular Chinese engagement under their exclusive sociocultural contexts.

5.3.3 The relationships among L2 motivation, frequency, and Chinese character reading achievement

From the prior two sub-sections, we understand that the CHL and non-CHL learners had similarities and differences in terms of their Chinese Mandarin learning motivation and the

frequency of extracurricular Chinese engagement. Since the two significant factors cannot be ignored in the second/foreign language learning, we then analyzed the relationships among the L2MSS, frequency of exposure, and Chinese character reading achievement of the CHL and non-CHL learners.

One important finding is that the Chinese character reading achievement was significantly correlated with L2 Chinese learning motivation among the CHL and non-CHL learners. The correlation test revealed that there existed a moderate positive relationship between the Chinese character reading achievement and CHL learners' general motivation ($r = .34$, $p < .01$), while there was a strong positive correlation between the Chinese character reading achievement and L2 motivation among non-CHL learners ($r = .58$, $p < .001$). It suggests that for both CHL and non-CHL learners, they tend to have greater Chinese character reading achievement when they embrace a higher motivation to learn Chinese. This finding is in line with our hypothesis and similar to some previous studies (e.g., Li & Zhang, 2021; Wong, 2018).

To get a more comprehensive picture of the L2 achievement and motivation relationships among the two groups of Chinese learners, we further scrutinized the correlations to each motivational component. It was found that among the CHL learners, their Chinese character reading achievement was positively related to the promotional instrumentality ($r = .36$, $p < .01$), the ideal L2 self ($r = .35$, $p < .01$), L2 learning experience ($r = .34$, $p < .01$), China and Mandarin instrumentality ($r = .29$, $p < .01$), and the intended efforts ($r = .29$, $p < .01$). However, their Chinese character reading achievement was not significantly correlated to the family influence ($r = .08$, $p = .453$) and the ought-to L2 self ($r = .20$, $p = .057$). In other words, although most CHL learners decided to learn Chinese due to their family background,

the family influence seemed to have no direct relationships to their Chinese character reading achievement. Perhaps it was because this motivational orientation was maintained at a neutral level among the CHL participants in this study. Another possibility was that there might exist some mediators in the effect of the family influence on their Chinese character reading attainment. Instead, the effects of the ideal L2 self, L2 learning experience, the promotional instrumentality, China and Mandarin instrumentality, and the intended efforts had significantly positive relationships to the CHL learners' character reading achievement.

In contrast, among the non-CHL learners, their Chinese character reading achievement was positively correlated to the promotional instrumentality ($r = .59$, $p < .001$), the ideal L2 self ($r = .57$, $p < .001$), the intended efforts ($r = .50$, $p < .001$), L2 learning experience ($r = .49$, $p < .001$), China and Mandarin instrumentality ($r = .46$, $p < .001$). Moreover, their Chinese character reading achievement was significantly related to the family influence ($r = .24$, $p < .05$) and the ought-to L2 self ($r = .21$, $p < .05$) but with very small positive associations. Altogether, the non-CHL learners' Chinese character reading attainment was significantly associated with the seven motivational factors.

In brief, for both CHL and non-CHL learners, the effects of the ideal L2 self, L2 learning experience, the promotional instrumentality, China and Mandarin instrumentality, and intended learning efforts had significantly positive correlations to their Chinese character reading achievement. Li and Zhang (2021), Wong (2018) found that the ideal L2 self could positively predict the CSL students' Chinese learning achievement, but the ought-to L2 self could be a negative predictor or have no effect. In this study, we also found the positive effect of the ideal L2 self on L2 achievement in the CHL and non-CHL groups, and no significant effect of the ought-to L2 self among the CHL learners but a weak effect of the ought-to L2

self among the non-CHL learners. We suppose that the CHL learners tended to feel more pressure from the expectations of their families and society during the Chinese learning process. They may generate an "anti-ought-to self" to react to such pressures (Liu & Thompson, 2018; Thompson & Vásquez, 2015). They might be reluctant to leave us with the impression that they learn Chinese because of these external expectations. Instead, the non-CHL learners generally have no such "annoyances", so that to meet the external expectations may encourage them to overcome the challenge of learning Chinese characters. Furthermore, the significant correlation between the L2 learning experience and L2 Chinese achievement in our study was in line with the findings in previous studies (e.g., Tan et al., 2017).

Another important finding is that the Chinese character reading achievement was significantly correlated with the frequency of extracurricular Chinese activity engagement among the CHL and non-CHL learners. The correlation test disclosed that there existed a moderate positive relationship between the Chinese character reading achievement and CHL learners' average frequency of after-class Chinese activities ($r = .38$, $p < .001$), whilst there was a strong positive relationship between the Chinese character reading achievement and extracurricular Chinese engagement frequency among the non-CHL learners ($r = .60$, $p < .001$). It suggests that for the two groups of learners, they would obtain higher Chinese character reading achievement if they had a higher frequency to engage in after-class Chinese activities. This finding is consistent with our hypothesis and some related studies.

To get more detailed information about the L2 achievement and frequency relationships among the CHL and non-CHL learners, we further examined the correlations to each extracurricular Chinese activity. It was uncovered that in the CHL group, their Chinese character reading achievement was positively related to the frequency of reading Chinese

books ($r = .36$, $p < .01$), speaking Chinese with family and friends ($r = .32$, $p < .01$), visiting China town or Chinese market ($r = .29$, $p < .01$), listening to Chinese songs ($r = .27$, $p < .05$), and writing Chinese characters ($r = .23$, $p < .05$). However, their Chinese character reading achievement was not significantly correlated to the frequency of watching Chinese TV programs ($r = .15$, $p = .150$). It might be due to that the frequency of watching Chinese TV programs was not significant different among the elementary, intermediate, and advanced CHL learners. In other words, the CHL learners may sometimes or often watch Chinese TV programs regardless of their Chinese proficiency level, even though their Chinese character reading achievement improved gradually from the beginning to the advanced stages. Overall, the frequency of reading Chinese books, speaking Chinese with family and friends, visiting China town or Chinese market, listening to Chinese songs, and writing Chinese characters significantly played some positive roles in the CHL learners' character reading achievement. Also, it is worth our attention that the CHL and non-CHL learners had significant differences in terms of the frequency of reading Chinese books, speaking Chinese, and visiting China town or Chinese market. Taken together, it seems that this finding might explain why the CHL learners gained better reading achievement than non-CHL learners at the intermediate and advanced Chinese levels.

By contrast, in the non-CHL group, their Chinese character reading achievement was positively correlated to the frequency of reading Chinese books ($r = .45$, $p < .001$), speaking Chinese ($r = .44$, $p < .001$), listening to Chinese songs ($r = .40$, $p < .001$), watching Chinese TV programs ($r = .38$, $p < .001$), writing Chinese characters ($r = .35$, $p < .01$), and visiting China town or Chinese market ($r = .31$, $p < .01$). In other words, the frequency of reading Chinese books, speaking Chinese with family and friends, listening to Chinese songs, watching Chinese TV programs, writing Chinese characters, and visiting China town or

Chinese market, all significantly played some positive roles in Chinese character reading achievement of the non-CHL learners. It suggests that attending these after-class Chinese activities may enhance the frequency of exposure to oral and print Chinese, which then could bear some positive effects on their character reading achievement.

From the statistical analysis, we found that the Chinese character reading achievement of the CHL and non-CHL learners was significantly correlated to the frequency of speaking Chinese. This finding was in congruence with one study result by Wang (2020, pp. 36-37) in which the 31 CFL learners' Chinese character recognition grades were highly correlated to their spoken Chinese proficiency. This research finding might explain the significantly better reading achievement of the CHL learners at the intermediate and advanced levels as they had a higher frequency of speaking Chinese after class than the non-CHL learners.

The third important finding is that the L2 Chinese learning motivation was significantly correlated with extracurricular Chinese engagement frequency among the CHL and non-CHL learners. As there is no theoretical base to examine the correlation between each L2 Chinese motivational variable and the frequency of each extracurricular Chinese activity, we mainly analyzed a general relationship between the average motivation and frequency of the CHL and non-CHL learners. The correlation test showed that there existed a strong positive relationship between the L2 Chinese motivation and the extracurricular Chinese engagement frequency of the CHL learners ($r = .54$, $p < .001$), and there was also a strong positive correlation between the L2 motivation and the frequency among the non-CHL learners ($r = .75$, $p < .001$). It suggests that for the CHL and non-CHL learners, they would have higher frequency to attend after-class Chinese activities if they had a higher Chinese learning motivation. This finding is also in accord with our hypothesis.

The fourth critical finding is the mediating effect of extracurricular Chinese engagement frequency on the relationship between L2 motivation and Chinese character reading achievement. Based on the correlation results, the further regression analysis found the predicting roles of L2 Chinese learning motivation and the frequency of engagement in after-class Chinese activities played in the CHL and non-CHL learners' Chinese character reading achievement, with the frequency being a significant mediator. In other words, the CHL and non-CHL learners with higher Chinese learning motivation tended to attend extracurricular Chinese activities more frequently and thus could have better Chinese character reading achievement. This finding was similar to the study of Wong (2018), in which the researcher found the significant indirect effect from the young CSL learners' L2 selves (motivation) to their Chinese reading achievement through the motivated behavior (the time and effort that they intend to devote to Chinese learning). The motivated learning behavior acted as a mediating role played in the predictive effect of L2 selves on L2 Chinese sentence and passage reading achievement. In the present study, the motivated behavior was transformed into the actual learning practice, the frequency of exposure to Chinese that the students committed to having after class. And we found the predictive influence of the leaners' overall motivation extent on their Chinese character reading achievement, with the extracurricular learning practice as a significantly mediating link. Moreover, Wen (2022) found the significantly positive correlation between the ideal L2 self, promotional instrumentality, and after-class Chinese activity engagement. She indicates that the positive interactions between L2 Chinese learning motivation and the learners' context could facilitate CSL learners to practice learning behavior and thus promote sustainable Chinese learning. Our findings are supported by their studies to a great extent.

Besides the significant indirect effect from L2 motivation to the learners' Chinese character reading achievement through the frequency of extracurricular Chinese engagement, the direct effect from L2 motivation to the achievement remained insignificant in the CHL group. It suggests that the more frequently the CHL learners were exposed to Chinese in daily life, the more possible that they could acquire a great number of Chinese characters and words, and their high frequency of attending extracurricular Chinese activities was mostly driven by their motivation to learn Chinese. By contrast, the direct effect from motivation to the achievement was still significant in the non-CHL group, suggesting that there could exist other mediators that can account for the L2 motivation and achievement relationship for the non-CHL learners. One possible explanation could be that, unlike the CHL learners who might have easy access to extracurricular learning resources, the non-CHL learners could depend more on the teachers' instruction and in-class learning materials.

In summary, the correlation analysis demonstrates that there are interrelationships among the Chinese character reading achievement, L2 Chinese learning motivation, and the frequency of extracurricular Chinese engagement, for both CHL and non-CHL learners. One major difference is that the correlations in the non-CHL group was stronger than in the CHL group. It implies that there might be other factors that may affect CHL learners' Chinese character reading achievement, such as the early print Chinese exposure mentioned in some studies (Zhang & Koda, 2021). Another possibility could be that the CHL learners' motivation in learning Mandarin might be driven by their family and sociocultural expectations that may evoke their inner resistance to exerting sustained effort to improve Chinese learning achievement (Liang, 2020). Unfortunately, we lack data to support such claims at present. Moreover, the CHL learners' Chinese character reading achievement was significantly related to the ideal L2 self, L2 learning experience, the promotional instrumentality, China and

Mandarin instrumentality, and the intended efforts. While the Chinese character reading achievement of the non-CHL learners was significantly correlated with the ideal L2 self, L2 learning experience, the promotional instrumentality, China and Mandarin instrumentality, and the intended efforts. Furthermore, the Chinese character reading achievement of CHL learners was significantly related to the frequency of reading Chinese books, speaking Chinese with family and friends, visiting China town or Chinese market, listening to Chinese songs, and writing Chinese characters. While the CHL learners' Chinese character reading achievement was significantly correlated with the frequency of all six Chinese engagement. All in all, we may conclude that perhaps the higher Chinese learning motivation one has, the more frequently one may engage in extracurricular Chinese activities, and the better Chinese character reading achievement one could get.

5.4 Individual perceptions of Chinese character instruction

In the previous section, we understand the close relationships between the Chinese character reading achievement and the learners' individual factors in terms of L2 motivation and the frequency of exposure to Chinese after class. The latter can be seen as one informal learning opportunity to Chinese characters. In this section, we should also consider the formal learning opportunities for the CHL and non-CHL learners to acquire Chinese characters, namely the class and textbook instruction. The subsequent sub-sections will discuss the learners' own perspectives on the two formal Chinese character learning situations.

5.4.1 CHL and non-CHL learners' views on Chinese character instruction in class

From the participants' written answers to the open-ended questions, the thematic analysis revealed that there were similarities and differences between the CHL and non-CHL learners' views on class Chinese character instruction.

In terms of the similarities, firstly, the CHL and non-CHL learners both attached great importance to the Chinese instructor's teaching charm. In other words, they believed that the teacher's personal quality and teaching methods had an important impact on their Chinese character learning outcomes. Actually, this point of view echoes the positive relationship between the L2 learning experience and Chinese character reading achievement of the CHL and non-CHL learners. Most students adore their Chinese teacher as she is very enthusiastic, patient, responsible, and creative when teaching Chinese characters and words. Moreover, the Chinese teacher usually adopts a variety of methods to teach students the Chinese words. For example, using the vivid pictures to illustrate the word meaning, creating funny stories to help students memorize the Chinese characters, telling the history and culture behind some Chinese characters, assigning Chinese character writing homework for students, etc. In addition, the CHL and non-CHL learners indicated that many Chinse characters and words are close to their life, such as greetings, jobs, food, and so on. Therefore, such positive learning attitudes and experiences could increase the students' learning motivation and facilitate them to remember a great number of Chinese characters.

On the other hand, the CHL and non-CHL learners held different views on the interesting aspects of Chinese character instruction and the instruction time. Generally speaking, although some students in both groups thought it interesting to learn Chinese characters in class, the CHL learners focused on the imagination used in learning Chinese characters, the

history of some characters, the character knowledge of structural rules, and the vivid examples; however, the non-CHL learners focused on how to make up stories in memorizing Chinse characters, relying more on the semantic radicals of compound characters, as well as the vivid examples. Making up stories though can help the learners to remember Chinese characters as fast as possible, but it may mislead them to ignore the internal rules of Chinese characters. With more and more characters appearing in class and textbooks, the learners may find it challenging to remember them by making up stories. Instead, the CHL learners were inclined to learn the character knowledge and history, which may help them to understand Chinese characters better and accumulate more and more characters. Furthermore, another difference is that the non-CHL learners viewed learning Chinese characters was very time-consuming and complicated (both in and out class), whereas the CHL learners thought the class time was too tight to learn more Chinese characters. It suggests that the CHL and non-CHL leaners might hold opposite attitudes toward Chinese character instruction time.

5.4.2 CHL and non-CHL learners' views on Chinese character instruction in textbooks

From the participants' written answers to the open-ended questions, the thematic analysis found that there were similarities and differences between the CHL and non-CHL learners' views on the textbook Chinese character instruction.

We divided their views into "satisfaction" and "dissatisfaction" parts. In terms of the similarities, firstly, the CHL and non-CHL learners were satisfied with their textbooks due to that most Chinese characters and words are close to life, and they are helpful and suitable for the learners at different proficiency levels. On the other hand, both the CHL and non-CHL

learners mentioned that the Chinese character section in their textbooks is not practical and there are no Vietnamese annotations. The students said that some Chinese characters in the textbooks are not often seen in current Chinese people's life, and they had no chance to use them outside the classroom. Since their textbooks are compiled in China (most of these textbooks are in the Chinese-English version), it is inconvenient for them to learn the Chinese characters and words, especially for those who are not fluent in reading English.

In Figure 8, two examples are extracted from one textbook *Tiyan hanyu: Shenghuo pian jinjie* [Experience Chinese: Living in China (advanced)] (Zhu & Chu, 2011, p. 18). There are five Chinese characters presented in the "Picture characters" part in the form of two words, "电视台/diàn shì tái/ [TV station]" and "大学/dà xué/ [university]". As what the students satisfied, there are authentic pictures to illustrate the Chinese characters, and "大学" is close to their life. Unfortunately, there are no Vietnamese meanings and no interpretations of the character knowledge (such as the character structure, embedded components, stroke numbers and patterns, etc.). Also, "电视台" is not commonly used in daily life nowadays.

Figure 8 An extraction from one textbook

Note. It is on page 18 in the textbook.

Additionally, both CHL and non-CHL learners are not fond of writing Chinese characters in their workbooks because it is very challenging and time-consuming. This point of view echoes the role of the ought-to L2 self in Chinese character reading achievement to some extent. The students have to meet the learning requirements to write Chinese characters although they dislike it. However, there was no or very weak relationship between the ought-to L2 self and Chinese character reading achievement in this study. Some studies have found the negative effects of the ought-to L2 self in second language learning attainment (Wen, 2022). Therefore, such negative learning attitudes toward their textbooks may hinder their enthusiasm to learn Chinese characters.

In terms of the differences in their satisfaction and dissatisfaction about the textbook Chinese character instruction, firstly, the CHL learners indicated that the Chinese characters and words in their textbooks are simple and easy to learn but insufficient in quantity and cannot meet their learning needs. In other words, they wish to learn more practical Chinese characters and words from textbooks. By contrast, the non-CHL learners said that there are abundant Chinese characters and words in their textbooks. They further indicated that most Chinese characters and words are boring, rigid, unattractive, and out of date. They complained that learning Chinese characters is very time-consuming rather than easy to learn. It suggests that the CHL and non-CHL leaners focused on the different aspects regarding the satisfaction and dissatisfaction with the Chinese character and word instruction in their textbooks.

5.4.3 Interactions between individual perceptions and Chinese character reading achievement

From the previous sub-sections, we understand that there existed similarities and differences between the CHL and non-CHL learners' views on the Chinese character instruction in class and textbooks. From the frequency counts to the themes in Table 13, in general, it seems that the CHL learners held more positive attitudes toward Chinese character learning in class and textbooks, particularly in Chinese character knowledge, history, and culture. Instead, the non-CHL learners seemed to rely more on the instructor's charm and methods in teaching Chinese characters. They both held positive and negative views on Chinese character instruction in class and textbooks but with different priorities.

Importantly, the inner voice (qualitative data) from the CHL and non-CHL learners can also reflect the relationships found in the statistical analysis (quantitative data). For example, the learners emphasized the positive relationship between the L2 learning experience and Chinese character learning outcomes, and no or very weak relationship between the ought-to L2 self and Chinese character reading achievement. Additionally, the CHL learners pointed out the insufficient Chinese characters and words provided in the textbooks and the limited instruction time in class, so that they often find out extra learning materials or learn more Chinese words on the internet. This echoes the positive relationships between the extracurricular Chinese engagement frequency and the Chinese character reading achievement. Overall, we may find the interactions between individual perceptions and Chinese character learning outcomes. In other words, the learners' positive attitudes and experiences could enhance their learning motivation and then facilitate them to accumulate more and more Chinese characters in and out of class. Conversely, the negative learning attitudes toward the class instruction and textbooks might hamper the learners' enthusiasm and confidence in learning more and more Chinese characters and words.

5.5 Implications for overseas Chinese character teaching and learning

The main purpose of this study is to propose some effective implications for the overseas Chinese character teaching and learning with the supporting empirical evidence. This section will discuss the pedagogical implications from two sides – the Chinese character teaching in and out of class, and the Chinese character instruction in textbooks.

5.5.1 Implications for Chinese character instruction in and out of class

First and foremost, teaching CHL and non-CHL learners Chinese characters is suggested after they complete *pinyin* learning. The characteristics of Chinese characters, the psychology of language teaching, and L2 acquisition laws mutually support the "starting with oral work and character teaching follows" approach (Zhao, 2011). In this study, we found that CHL and non-CHL learners had no differences in reading Chinese characters at the very beginning, but CHL learners obtained significantly higher scores than non-CHL learners at the intermediate and advanced Chinese level. It suggests that the learners may be more efficient in learning Chinese characters after they have a wide range of oral vocabulary. Therefore, for the learners who already know many oral Chinese vocabularies, we may teach them the Chinese language and characters simultaneously; otherwise, we may teach the language first then Chinese characters.

Furthermore, we have found the commonalities and differences in the developmental trajectory of Chinese character reading achievement among adult CHL and non-CHL learners. As international Chinese teachers, it is helpful to our instructional design to notice the learning characteristics of diverse students. We should conform to their learning routines when teaching Chinese characters. For instance, the Chinese instructor could teach the elementary Chinese characters, the characters with a few strokes, and the characters in those high frequency topic words at the beginning stage. At the same time, it is essential to introduce the knowledge about the Chinese character structure (i.e., left-right, top-down, half-surrounded/surrounded) and formation methods (pictographs, self-explanatory characters, phonograms, associative compounds). When teaching the higher-level students, the differences between CHL and non-CHL learners may become pronounced. We Chinese teachers could prepare reading materials that apt to the CHL and non-CHL learners respectively rather than amplify their discrepancies. Moreover, by virtue of the limited class time in each lesson, the teacher could expound the key Chinese characters in the topic words to make students have a deep impression, instead of only providing the pronunciation and meaning for each vocabulary. In other words, we may teach Chinese characters in concrete and authentic contexts.

In addition, for the CHL and non-CHL learners in Vietnam, one potential advantage could be that there are many Sino-Vietnamese words in the Vietnamese written language, constituting 60%-70% (W. Luo, 2018, p. 7). Due to the frequent exchange between China and Vietnam in history, the two languages and cultures interact with each other, many Chinese characters and words had been introduced into Vietnam in ancient times, and even nowadays Chinese characters can be seen in some ancient Vietnamese architecture. Sino-Vietnamese words are the typical product from such an exchange, which form an integral part of the Vietnamese

language (Nguyen, 2006; Wang, 1948). Although modern Vietnamese use an alphabetic writing system, there still remain many Sino-Vietnamese words that share similar pronunciations or meanings to some Chinese characters despite in the form of Latin words. For example, “花 (/huā/ [flower])” in Vietnamese is “hoa”, “国 (/guó/ [country])” in Vietnamese is “Quốc gia”, “病 (/bìng/ [illness])” in Vietnamese is “bệnh”; “公园 (/gōng yuán/ [park])” in Vietnamese is “công viên”, “希望 (/xī wàng/ [hope])” in Vietnamese is “hy vọng”, “管理 (/guǎn lǐ/ [manage])” in Vietnamese is “quản lý”, to name a few. Although there exist both positive and negative transfer effects, the local Chinese instructors could teach students those Chinese words that have consistent Sino-Vietnamese correspondences in furtherance of Chinese character learning.

Secondly, this study has verified the significant roles of L2MSS in CFL and CHL and the frequency of extracurricular Chinese activity engagement in the development of Chinese character reading achievement among the adult CHL and non-CHL learners in Vietnam, as well as the positive relationship between L2MSS and the frequency of attending after-class Chinese activities. Therefore, I then propose several implications in relation to Chinese learning motivation and the frequency of Chinese exposure for learning Chinese characters in and out the classroom.

For one thing, the Chinese instructors could encourage the students to imagine themselves becoming a fluent Chinese character reader, strengthening their ideal L2 self. We should help them build confidence in reading in Chinese via diverse measures. For example, the students can search and read Chinese information around their life, send Chinese messages to their family members or friends, watch Chinese movies or TV series without translated subtitles,

and so forth. Moreover, the Chinese teachers should keep their enthusiasm about Chinese character instruction and adopt various teaching methods to introduce the character knowledge, history, and culture to the students. In other words, we should do our utmost to promote a positive L2 learning experience in and out of class among the CHL and non-CHL learners. Also, the Chinese teachers could emphasize the importance of reading Chinese characters in future career development if the students want to go in for work that will use Chinese, such as reading Chinese documents, chatting with Chinese colleagues in text messages, writing or typing Chinese reports, etc. Overall, it is reasonably vital to raise the L2 Chinese learning motivation of CHL and non-CHL learners, both inside and outside the classroom. The positive effects are not confined to Chinese character learning.

For another thing, usually, it is hard to divide the CHL and non-CHL learners into different classes due to some practical reasons. Most universities organize the Chinese courses based on the learners' initial Chinese proficiency level. Since the CHL learners tend to have dramatic improvement as they proceed to learn Chinese, we can provide them extra support to promote their learning goals. For example, the teacher may introduce some Chinese reading materials of medium difficulty to the CHL learners, guide them to pay attention to the Chinese characters when they wander in China towns or Chinese markets and learn to read the Chinese menus at Chinese restaurants, advise them to communicate with their Chinese family members or relatives in oral or print form at regular intervals, etc. Additionally, the CHL and non-CHL learners could help each other in accumulating Chinese characters and words. The teacher can encourage them to participate in their favorite after-class Chinese activities on a regular frequency, such as reading the Chinese books on their interested topics, watching Chinese TV programs or movies with Chinese subtitles, copying the lyrics of their favored Chinese songs, etc. In a word, we should take full advantage of the online and offline

resources to assist the students' Chinese character learning in and out of the class.

Thirdly, this study has also found the interactions between the learners' perceptions of class and textbook instruction and their Chinese character learning outcomes. To facilitate the students to hold positive attitudes toward learning Chinese characters, we Chinese teachers should first improve our teaching quality and form our own teaching styles to spark the students' interest in Chinese characters. In the meantime, we may help the students overcome their anxiety in learning Chinese characters, fear of the difficulty in memorizing and writing Chinese characters. At the beginning of teaching Chinese characters, the teacher could tell the students that they can understand most Chinese text when they accumulate around 2400 high-frequency characters. On the other hand, although teaching Chinese characters through making up stories could be a fun way to help students memorize the orthography and meaning efficiently, we cannot mainly rely on such methods as the learners need more character related knowledge when they reach higher levels. Therefore, we may combine the two ways accordingly, teaching Chinese character knowledge in the class and guiding students come up with their own creative ways to remember these Chinese characters and related knowledge after class. Finally, seeing that there usually remains less time for Chinese character instruction in current Chinese courses, it would be our priority to promote students' positive learning attitudes in various measures.

5.5.2 Implications for Chinese character instruction in textbooks

This sub-section moves to the implications for Chinese character instruction in the textbooks. It mainly discusses from the students' satisfactions and dissatisfactions with their four

Chinese textbooks to enlighten our contemplations on the textbook compilation.

I start with suggestions from the CHL and non-CHL learners' enjoyments in learning Chinese characters with the aid of textbooks. As there are almost no special blocks for elucidating Chinese characters in the series of *Experiencing Chinese* textbooks, our students mainly learn Chinese characters from the vocabulary section in each lesson. Both CHL and non-CHL learners are satisfied with the Chinese words that they can use in real life, so we could introduce such Chinese characters in each lesson, from simple structures to complex ones, with pictures to illustrate them. Moreover, our students agreed that the Chinese words in their textbooks are suitable for the learners at each level. We should adhere to this notion and may select Chinese characters and words in reference to *Chinese Proficiency Grading Standards for International Chinese Language Education (GF 0025-2021)* (2021) when compiling the textbooks. Importantly, we cannot forget to combine the words with the contexts of local Chinese learners. For example, we should consider the Sino-Vietnamese words and some specially used local words when developing the textbooks and workbooks for CHL and non-CHL learners in Vietnam.

On the other hand, in terms of their dissatisfactions with the textbooks, I propose the following suggestions. Firstly, there is an urgent need to renew the Chinese textbooks for the local CHL and non-CHL learners (Chen, 2018). For example, we should develop or compile the Chinese textbooks with Vietnamese translations and incorporate the practical and updated words around the learners' daily life. Secondly, the Chinese character learning activities in the textbooks should be more diverse and attractive, which may help the learners preview and review the words outside the class. Our students suggest that there could be more vivid pictures to illustrate the key Chinese characters and words in each lesson. In this regard, as

one way to catch the students' eyes, we may use the internet memes (an expression in graphic interchange format), which are extremely popular nowadays in young people's daily texting, selecting those memes with Chinese words in particular. Likewise, the exercises in students' workbooks should not be constrained to writing Chinese characters, making words, or filling the blanks, and they should also be more diverse and attractive. For instance, more exercises about the Chinese character knowledge, history, and culture could be incorporated in both textbooks and workbooks. Overall, it is always the priority to meet the learners' practical needs when developing the learning materials.

To this end, I recommend a textbook *Méthode De Chinois Premier Niveau* (2003) compiled by Isabelle Rabut, Yongyi Wu, and Hong Liu for Chinese Mandarin learners in France. In addition to filling the blanks, making words and sentences, there are many fascinating and effective exercises on Chinese character knowledge at the end of each lesson, helping students consolidate and review the learned characters. For example, discriminating the similar Chinese characters (e.g., "大"/dà/ [big] & "太"/tài/ [too], "天"/tiān/ [sky, day] & "夫"/fū/ [husband], "午"/wǔ/ [noon] & "牛"/niú/ [cattle], etc.), finding the different components between characters (e.g., "持"/chí/ [hold] & "特"/tè/ [special], "思"/sī/ [think] & "恩"/ēn/ [gratitude], "国"/guó/ [country] & "园"/yuán/ [garden], etc.), splitting the components from the given characters (e.g., "源" – "氵, 厂, 白, 小", "部" – "立, 口, 阝", "堡" – "亻, 口, 木, 土", etc.), choosing the word meaning based on the semantic radicals (e.g., vocabulary: "呼吸", "蘑菇", "肚子"; meaning choices: "breathe", "mushroom", "belly"), and so on. The textbook compilers designed a variety of Chinese character exercises according to characters' orthography, pronunciation, and meaning, the relationships between characters and words, and the learners' cognitive development (Wu & Zhang, 2020).

In short, there should be dedicated blocks for Chinese character learning and a variety of matched exercises in each lesson. The selected Chinese characters and words should be close to real life and appropriate for the learners at different levels. The content of the Chinese textbooks should be evolved with the times and be combined with the local contexts. In light of these considerations, it is a good practice to renew the current Chinese textbooks and workbooks to promote students' positive attitudes toward their learning materials.

5.6 Conclusion

5.6.1 A general conclusion of the study

In the final summary section, I will give an overview of the study background, research questions, research methods, core findings, and the study significance.

The study background lies in the vital position of Chinese character reading in teaching Chinese as a foreign and heritage language with a focus on literacy development, the history and present condition of Chinese teaching in Vietnam, the commonalities and differences between the CHL and non-CHL learners, as well as my research interests. Firstly, as a lower-level reading process, Chinese character reading is essential to Chinese language learning, particularly in Chinese literacy development. The literature review uncovered that voluminous studies have investigated the Chinese character acquisition by children of

Chinese native speakers and young and adult CSL/CFL learners, but a very few studies have systematically compared the CHL and non-CHL learners in this regard, at least to my current knowledge. Secondly, although Chinese language education has a long history in Vietnam, the Chinese character teaching and learning have not yielded much attention among many teachers and students to date, vis-à-vis communication and grammar instruction. And there has been lacking appropriate Chinese textbooks and workbooks for the local learners. Thirdly, the CHL learners are different from the non-CHL learners in terms of linguistic competence development, L2 motivation, anxiety, and identity to varying degrees. The number of Chinese language learners has been on the ascendancy in recent decades; however, the learning condition of CHL and non-CHL learners should be taken into consideration because of the diverse backgrounds of these overseas students. My particular interest goes to Chinese character learning for CHL learners inasmuch as my friends and I encountered such problems when teaching Chinese abroad.

In light of the literature review and the above considerations, this study proposed three chief research questions reviewed herein: RQ1: Are there developmental differences in learning Chinese character reading among adult CHL and non-CHL learners in Vietnam? If yes, what are the differences and commonalities? RQ2: Are the differences in CHL and non-CHL learners' Chinese character reading achievement affected by their L2 Chinese learning motivation and frequency of extracurricular Chinese activity engagement? RQ3: Are the differences in CHL and non-CHL learners' Chinese character reading achievement influenced by their views on the formal instruction in class and textbooks? How?

To investigate the research problems, this study combined the quantitative and qualitative methods with the aid of online devices. Together, 89 CHL learners and 92 non-CHL learners

completed all research tasks. To answer the first research question, we conducted an online Chinese character reading test, consisting of 100 single character reading task and 108 two-character word reading task, among the Vietnamese CHL and non-CHL learners at the elementary, intermediate, and advanced Chinese proficiency levels. The results suggest that the CHL and non-CHL learners performed similarly in reading Chinese characters at the beginning stage, while the CHL learners gained significantly better achievement than non-CHL learners at the intermediate and advanced stages. Both groups of learners had better performance in recognizing the two-character words than the single Chinese characters. And their reading scores became lower as the word level increased and the number of topics reduced. Moreover, the CHL and non-CHL learners seemed to have different development trajectories in learning the sub-knowledge of Chinese characters, such as the character structure, formation methods, and visual complexity.

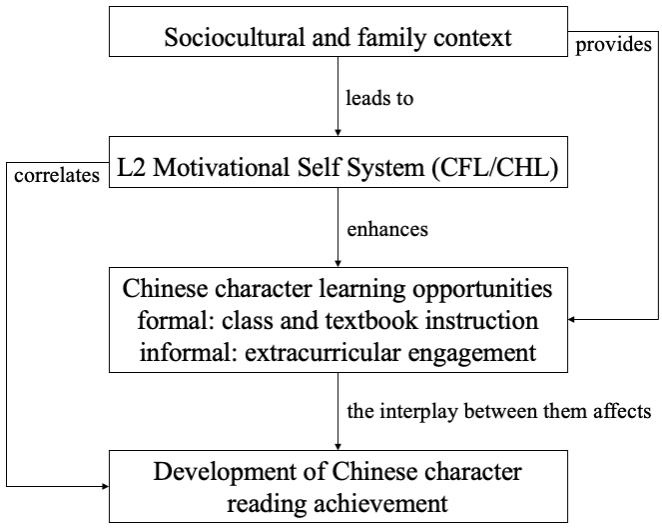
To answer the second research question, we administered an online Chinese learning questionnaire including the participants' demographic and background information, their frequency of attending after-class Chinese activities, and their L2MSS in learning Chinese Mandarin. The statistical analysis revealed that the average L2 Chinese learning motivation and the extracurricular Chinese engagement frequency of the CHL learners was significantly higher than the average motivation and frequency of the non-CHL learners. Moreover, the CHL and non-CHL learners who had higher L2 Chinese learning motivation and frequency of attending extracurricular Chinese activities tended to have better Chinese character reading achievement, and the learners who had higher motivation to learn Chinese usually had higher frequency to engage in after-class Chinese activities. The relationships among Chinese character reading achievement, L2 Chinese learning motivation, and the frequency of extracurricular Chinese activity engagement in the non-CHL group were relatively stronger

than the relationships in the CHL group. Additionally, for both CHL and non-CHL learners, we found that the L2 Chinese learning motivation significantly predicted the Chinese character reading achievement, with a mediating link of the after-class Chinese engagement frequency.

To answer the third research question, we employed five open-ended questions about class and textbook Chinese character instruction at the end of the Chinese learning questionnaire. For each question, at least there were around 30 valid answers in the two groups, respectively. The qualitative data analysis implied that the students' views on Chinese character formal instruction (including classes and textbooks) may also had some influence on their Chinese character learning achievement. Furthermore, our findings suggest that there were similarities and variances in the CHL and non-CHL learners' perspectives. The CHL learners seemed to be more interested in learning the history, culture, and combination rules behind Chinese characters, while the non-CHL learners tended to prefer making up stories to remember Chinese characters. On the other hand, both CHL and non-CHL learners showed some negative views on the Chinese character instruction in the current class and textbooks, such as no extra time for detailed Chinese character tutoring, the outdated and unpractical words, no Vietnamese explanations in their textbooks, etc. Overall, the students who embraced more positive attitudes toward Chinese character instruction in class and in textbooks were inclined to have more confidence in reading Chinese characters and gain better learning outcomes.

To make it clearer, I propose a framework to conclude the core findings (see Figure 9 below).

Figure 9 A framework of Chinese character reading achievement by CHL and non-CHL learners



Note. CFL: Chinese as a foreign language; CHL: Chinese as a heritage language

In conclusion, this study illustrates the similarities and discrepancies between Vietnamese CHL and non-CHL learners at different proficiency levels, from their Chinese character reading achievement, L2MSS in learning Chinese Mandarin, frequency of extracurricular Chinese activity engagement, and views on Chinese character formal instruction. The research findings again support the theory of Three Concentric Circles of Mandarin users, in which CHL learners are in the Outer Circle, between the Inner Circle of Chinese native speakers and the Expanding Circle of non-CHL learners (Goh & Lim, 2010). Therefore, it stands to reason that we may develop different teaching forms and contents for Chinese character learning by CHL and non-CHL learners.

By and large, the significance of this study lies in three aspects.

Firstly, it provides a general picture of Chinese character reading development among adult CHL and non-CHL learners in Vietnam, filling the gaps that little research has been conducted in this context, particularly for the CHL learners in Vietnam. It also develops a

theoretical framework that could explain the commonalities and differences between the Chinese character reading achievement of the Vietnamese CHL and non-CHL learners, by connecting the relationships among L2 motivational self system in learning Chinese, frequency of extracurricular Chinese activity engagement, students' views on Chinese character instruction, and L2 Chinese character reading development.

Secondly, this study proposes some pedagogical implications for international Chinese teachers and textbook compilers, based on the research findings. In short, it suggests that the Chinese teachers should attach importance to Chinese character instruction in and out of the class, pay attention to the sociocultural and family context of CHL and non-CHL learners, always help students improve L2 Chinese learning motivation, and continuously provide a positive L2 learning experience for students. Moreover, the Chinese textbook compilers should attach importance to the form and content of Chinese character instruction, arrange a dedicated section for displaying the orthographic knowledge, culture, and history of the key Chinese characters in each lesson, and develop different learning materials to meet the requirements of diverse local learners.

Last but not least, we have developed an online testing platform to replace the face-to-face data collection method, which was successfully implemented in this study. This platform not only can obtain the instant pronunciation and meaning of the test Chinese characters from each participant but also can serve as a testing device for the teachers to examine students' learning outcomes of Chinese characters and vocabulary in daily teaching. In the post epidemic era, a new norm could be a hybrid teaching of online and offline modes. Hence, our online platform might be a good auxiliary to teaching, learning, and research in such a context. On the other hand, the inevitable limitations of the online tool cannot be ignored and

should be in continuous optimization. Conclusively, this study is of both academic and practical significance.

5.6.2 Limitations of the study

This study is an integrated research project inevitably with limitations in theoretical base, research methodology, and unsettled issues. I have listed some limitations as follows.

Firstly, in terms of the theoretical base, this study started from Spolsky's general model of second language learning as it connects the L2 learners' social contexts, attitudes, motivation, personal traits, learning opportunities, and L2 learning outcomes. On the basis of this model, this study investigated L2 Chinese character reading achievement of the CHL and non-CHL learners and some latent influencing variables, by consideration of the differences in social contexts, L2 motivational orientations, and learning opportunities between CHL and non-CHL learners. This study only examined the influence of L2MSS in learning Chinese, extracurricular Chinese activity engagement frequency (informal learning opportunities), the students' views on Chinese character instruction (formal learning opportunities) on L2 Chinese character reading achievement, though it provided a general picture of Chinese character reading development of the CHL and non-CHL learners. However, there could be other variables that also affect the Chinese character reading differences between CHL and non-CHL learners, such as the language learning aptitude, cognitive skills, anxiety, learning strategies, previous knowledge, etc. Also, the L2 learners' identity plays a significant role in the target language acquisition (Norton & Toohey, 2011).

Secondly, as far as the research methods are concerned, we mainly used the learners' self-report to collect the data on L2 Chinese learning motivation and extracurricular Chinese activity engagement frequency. The self-reporting data may not uncover the real situation of each participant. Moreover, there were only a tiny number of single-component characters and the compound characters of different levels, structures, formation ways, and strokes in the reading test. This was confined to the limited sum of the total test characters since participants already felt fatigued from completing the 208 reading items on the online platform. And the Chinese characters and words were all selected from the participants' textbooks. Due to such constraints, this study may not present a fully comprehensive picture of the reading achievement of the CHL and non-CHL learners. Also, the Chinese character reading test was held through the internet. Thus, it was inevitably affected by some network issues occasionally, such as getting disconnected, a network latency, the withdrawal of participants during the test, etc. Furthermore, this study adopted a cross-sectional research design, recruiting the participants from different Chinese proficiency levels instead tracing their reading achievement trajectory. Therefore, it might be inappropriate for us to get an accurate understanding of the Chinese character reading development and motivation changes of the CHL and non-CHL learners.

In addition, constrained by the researcher's language barrier (limited proficiency in Vietnamese), this study only collected the participants' written texts to the five open-ended questions as the qualitative data, which may confine our deep understanding of the relationship between the learners' views on L2 Chinese character instruction and the development of their reading achievement. Triangulation is a significant consideration in qualitative research methods and multiple measures can interactively check the conclusion from different aspects (Maxwell, 2013, p. 115). Because of some practical reasons,

unfortunately, this study lacks other measures to understand the CHL and non-CHL learners' views on Chinese character instruction in class and textbooks (i.e., the interview data).

Lastly, there remain some unaddressed issues in this study, such as the other factors related to the differences in Chinese character reading achievement between the CHL and non-CHL learners, the other mediating effects on the relationship between L2 Chinese learning motivation and Chinese character reading achievement, how the learners' views influence their Chinese character learning development, whether there are differences in the higher-level reading areas (i.e., sentence and passage comprehension) and in writing Chinese characters between the CHL and non-CHL learners, whether our research findings could be applicable to the CHL and non-CHL learners in other countries or regions, etc.

5.6.3 Suggestions for future study

According to the limitations of this study, I would like to make some suggestions for the future study from three aspects – the theoretical frameworks, research methods, and some issues to be further investigated.

Future studies may consult other theoretical frameworks specially developed for the CHL learners or improved the framework in the findings of the current study. We may compare the CHL and non-CHL learners' Chinese learning aptitude, identity, anxiety, cognitive abilities, learning strategies, previous Chinese knowledge, early Chinese oral and print input, etc. In addition, future researchers may generate the grounded theory to better explain the similarities and variances in Chinese learning development among the CHL and non-CHL

learners, from the emic and etic perspectives.

Concerning the research methods, firstly, we can conduct a longitudinal study for a better observation of the Chinese character learning development among the CHL and non-CHL learners in Vietnam or other countries. In addition to conducting the reading tests online, we may use the test platform with the participants in person for a better manipulation. We may also conduct the character form retrieval test (i.e., Chinese character spelling/dictation). Furthermore, we can select more Chinese characters and words from a large corpus and invite more CHL and non-CHL learners to attend the study, in order to enhance the generalizability. Additionally, as there is no recognizable scale heretofore to investigate L2 learners' views on formal Chinese character instruction (including in the class and textbooks), the current study only collected some survey qualitative data attempting to explore this issue. Other qualitative methods should be incorporated to achieve triangulation, such as interviews and class observations. In the future study, the quantitative and qualitative measures can be taken together to examine the interrelationships among these variables. Also, we can learn to use structural equation modeling to better explain these complex relationships deeply.

In the end, some issues are waiting for further investigation in future studies. For instance, (a) the Chinese character learning situation of the CHL and non-CHL learners in and outside China (whether there could be influences of a target language environment), or the Chinese learning conditions of the CHL learners in different countries and regions (e.g., comparison of CHL learners in Indochina or across East Asia), to investigate the impact of language on Chinese character learning; (b) some other factors that may affect the variances in Chinese character reading development between CHL and non-CHL learners (such as the early Chinese learning experience, parents' and teachers' attitudes, learning strategies, the learners'

identity and anxiety, etc.); (c) other mediating effects (in addition to the learners' frequency of extracurricular Chinese activity engagement) played in the influence of L2 motivation to L2 achievement; (d) the relationships among the development of Chinese literacy achievement and L2 Chinese learning motivation, frequency of exposure, and the learners' views on formal instruction. Herein, the Chinese literacy achievement is not confined to lower-level reading. Instead, we could compare their achievement in learning to read Chinese idioms, sentences, passages, type and write Chinese characters, etc. Albeit some of these considerations might not be easy to measure, we are encouraged to explore the unknown in constant attempts, either by quantitative, qualitative, or mixed methods.

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Appendices

Appendix A Chinese character reading test materials

1. Single Chinese character reading task (four exemplars & 96 test items)

汉字 Chinese characters	拼音 Chinese pronunciation	意思（英文）Meaning in English	意思（越文）Meaning in Vietnamese
山	shān	mountain	núi
愉	yú	joyful	vui vẻ
会	huì	can	có thể, sẽ, hội
遇	yù	meet	gặp
请	qǐng	please, invite	xin vui lòng, mời
花	huā	flower	bông hoa
毕	bì	end, finish, complete	kết thúc, hoàn thành
言	yán	say, speak; speech	nói, ngôn ngữ
月	yuè	the moon, month	mặt trăng, tháng
炖	dùn	stew	món thịt hầm
梦	mèng	dream	mơ
问	wèn	ask	hỏi
想	xiǎng	think	nghĩ

国	guó	country	Quốc gia, nước
趣	qù	interesting	hấp dẫn, thú vui
住	zhù	live	sống, nơi ở, trực tiếp
下	xià	under, below, down	dưới, xuống
卤	lǔ	stew in soy sauce, thick gravy	hầm trong nước tương
雾	wù	fog	sương mù
笑	xiào	laugh, smile	cười
冰	bīng	ice	nước đá, Băng
匙	shi, chí	key, spoon	chìa khóa, thìa
包	bāo	bag, package	túi, gói
圆	yuán	round, circle	vòng tròn
订	dìng	reserve	đặt trước; ký kết
雨	yǔ	rain	mưa
好	hǎo	good	tốt, khỏe
慰	wèi	comfort, console	an ủi
返	fǎn	return	trở về, quay trở lại
尺	chǐ	ruler	thước
门	mén	door	cửa
镜	jìng	mirror	gương, kính
多	duō	many	nhiều

川	chuān	short for Sichuan Province; river; plain	Tứ Xuyên; con sông; trơn
对	duì	correct, right	đúng, chính xác
酱	jiàng	sauce	nước sốt, tương
册	cè	volume	bổn sách, quyển sách
教	jiāo	teach	dạy
菜	cài	dish, vegetables	món ăn, rau
病	bìng	illness	bệnh
匆	cōng	in a hurry	vội vã, nóng vội
裤	kù	pants, trousers	quần
灸	jiǔ	cauterize, moxibustion	châm cứu
烤	kǎo	roast	nướng
末	mò	end	cuối, kết thúc
鼓	gǔ	drum	trống, cổ vũ
疾	jí	disease	dịch bệnh, bệnh tật
本	běn	book; original; basis	quyển; gốc; căn bản
闹	nào	noisy	náo nhiệt, ồn ào
删	shān	delete	xóa bỏ
座	zuò	seat	chổ ngồi
停	tíng	stop	ngưng, dừng

爸	bà	dad, father	cha, ba, bố
疲	pí	tired	mệt mỏi
箱	xiāng	box, case	cái hộp, rương
疏	shū	distant, sparse	khai thông; sơ hở; thưa thớt
牙	yá	tooth	răng
园	yuán	garden	vườn, công viên
履	lǚ	shoes, footstep	giày, bước chân; thực hiện
弦	xián	string	dây chỉ, dây cung
迟	chí	late	muộn, trễ
卖	mài	sell	bán
耳	ěr	ear	tai
族	zú	clan, nationality	tộc
匠	jiàng	craftsman, master	thợ thủ công
酥	sū	crisp	giòn
囱	cōng	chimney	ống khói
敬	jìng	respect	trân trọng, tôn kính
芳	fāng	fragrant	thơm, Phương
叉	chā	fork, cross	nĩa, chéo
守	shǒu	guard, keep watch, observe	bảo vệ, tuân thủ

勺	sháo	spoon	muỗng, thìa
原	yuán	original; excuse; reason; plain	gốc; xin lỗi; nguyên nhân; trơn
中	zhōng	middle	trong, giữa, trung
挚	zhì	sincere	thật tình, chân thành
朱	zhū	bright red, scarlet; a surname	đỏ thẫm; họ Chu
试	shì	try; test	thử; thí nghiệm
烫	tàng	very hot, scalding	nóng bức
庙	miào	temple	ngôi đền, miếu
舟	zhōu	boat	thuyền
卧	wò	lie down	nằm xuống; phòng ngủ
拌	bàn	stir, mix	khuấy động, trộn
叠	dié	pile up, fold	chồng lên, gấp lại
闲	xián	not busy, leisure	nhàn, rãnh rỗi
爪	zhuǎ, zhǎo	claw	móng vuốt
忠	zhōng	loyal	trung thành
苹	píng	apple	quả táo, bèo, bình
逸	yì	easy and comfortable	thanh nhàn; giãn thư
丸	wán	ball, pill	trái bóng, viên

			thuốc
觅	mì	look for, seek	tìm kiếm
闷	mèn, mēn	sad and silent; cover tightly, stop speaking; muggy	bực bội; đậy chặt; đừng nói nữa; oi bức
催	cuī	urge	thúc giục
水	shuǐ	water	nước
昆	kūn	elder brother; offspring; the name of a place (Kunming); a surname	anh trai; con đẻ; Côn Minh; họ
逐	zhú	chase, pursue	săn bắt, dần dần
亦	yì	also, too	cũng thế, cũng vậy
寸	cùn	inch	tấc, kích
财	cái	wealth	tài chính, tài phú
票	piào	ticket	vé, phiếu
康	kāng	health, well-being	sức khỏe, khoẻ mạnh

2. Two-character word reading task (108 test items)

词语 Words	拼音 Chinese *pinyin*	意义（英文）Meaning in English	意义（越文）Meaning in Vietnamese
星期	xīng qī	week	thứ, tuần

衣服	yī fu	clothes	quần áo, y phục
公园	gōng yuán	park	công viên
打折	dǎ zhé	discount	giảm giá, chiết khấu
兴趣	xìng qù	interest	hứng thú, lãi
邮件	yóu jiàn	email; postal packet	e-mail; bưu kiện
烤鸭	kǎo yā	roast duck	vịt quay
度假	dù jià	go on vacation/holiday	đi nghỉ, kỳ nghỉ
化妆	huà zhuāng	make up	hóa trang, trang điểm
高兴	gāo xìng	happy	vui mừng, vui vẻ
司机	sī jī	driver	tài xế, người lái xe
周末	zhōu mò	weekend	cuối tuần
饭馆	fàn guǎn	restaurant	quán ăn
简历	jiǎn lì	CV, resume	sơ yếu lý lịch
同伴	tóng bàn	partner	cộng sự, đồng hành
电脑	diàn nǎo	computer	máy tính, vi tính
发票	fā piào	invoice	hóa đơn
钥匙	yào shi	key	chìa khóa
谈论	tán lùn	talk about	đàm luận
点心	diǎn xīn	dim sum, light	điểm tâm

		refreshments	
初次	chū cì	first time	lần đầu tiên
堵车	dǔ chē	traffic jam	kẹt xe
出差	chū chāi	go on a business trip	công tác
今天	jīn tiān	today	hôm nay
继续	jì xù	continue	tiếp tục
长城	cháng chéng	the Great Wall	Vạn lý trường thành
喜欢	xǐ huān	like	thích, giống
地铁	dì tiě	metro	tàu điện ngầm
扮演	bàn yǎn	role play	diễn, đóng vai
毕业	bì yè	graduate	tốt nghiệp
散步	sàn bù	take a walk	tản bộ
推荐	tuī jiàn	recommend	tiến cử
公寓	gōng yù	apartment, flat	chung cư
结果	jié guǒ	result	kết quả
手册	shǒu cè	handbook, manual	sổ tay
锻炼	duàn liàn	exercise	tập thể dục, bài tập
吃饭	chī fàn	have a meal	ăn cơm
旅游	lǚ yóu	travel	du lịch
漂亮	piào liang	beautiful, pretty	đẹp
细节	xì jié	detail	chi tiết

搬家	bān jiā	move house	chuyển nhà
目录	mù lù	catalogue	mục lục
咳嗽	ké sou	cough	ho
知道	zhī dao	know	biết
朋友	péng you	friend	bạn bè
中医	zhōng yī	Chinese medicine	trung y
欢迎	huān yíng	welcome	chào mừng, hoan nghênh
答案	dá àn	answer	đáp án
图片	tú piàn	picture	tấm hình, hình ảnh
打包	dǎ bāo	take-away package, pack	gói mang về
地址	dì zhǐ	address	địa chỉ
衬衫	chèn shān	shirt	áo sơ mi
跨国	kuà guó	transnational	xuyên quốc gia
鼠标	shǔ biāo	mouse	chuột vi tính
列举	liè jǔ	list	liệt kê
容易	róng yì	easy	dễ dàng
古代	gǔ dài	ancient times	cổ đại
健康	jiàn kāng	health	khỏe mạnh
描述	miáo shù	describe	miêu tả
辞职	cí zhí	resign	từ chức
苹果	píng guǒ	apple	trái táo

香水	xiāng shuǐ	perfume	nước hoa
替换	tì huàn	replace	thay thế
翻译	fān yì	translate	phiên dịch
角色	jué sè	role	vai diễn, vai trò
工作	gōng zuò	work, job	việc làm, công việc
感谢	gǎn xiè	thank, be grateful	cảm ơn, tri ân
观察	guān chá	observe	quan sát
书架	shū jià	bookshelf	giá sách, kệ sách
比赛	bǐ sài	competition	trận đấu, thi đấu
销售	xiāo shòu	sale	bán hàng
毛衣	máo yī	sweater	áo len
厨师	chú shī	chef	đầu bếp
健身	jiàn shēn	keep fit with exercise	tập thể dục
裙子	qún zi	dress	váy, đầm
小区	xiǎo qū	neighborhood	khu dân cư, cộng đồng
迷路	mí lù	get lost	lạc đường
恭喜	gōng xǐ	congratulate	chúc mừng
电话	diàn huà	phone	điện thoại
希望	xī wàng	hope	hy vọng
大概	dà gài	probably	đại khái, khoảng,

			có lẽ
位置	wèi zhi	location	vị trí
冰箱	bīng xiāng	fridge	tủ lạnh
会计	kuài jì	accountant	kế toán
大厦	dà shà	large building	nhà cao tầng, tòa nhà
填写	tián xiě	fill in	điền vào
财务	cái wù	finance	tài vụ
单元	dān yuán	unit	đơn vị, đơn nguyên
经理	jīng lǐ	manager	giám đốc
报酬	bào chou	remuneration	thù lao
问题	wèn tí	question	vấn đề
管理	guǎn lǐ	manage	quản lý
场景	chǎng jǐng	scene	cảnh
抱怨	bào yuàn	complain	phàn nàn, oán trách
卡片	kǎ piàn	card	tấm thiệp, thẻ
贵宾	guì bīn	VIP, honored guest	khách quý, khách vip
民族	mín zú	nation	dân tộc
玻璃	bō li	glass	thủy tinh

萝卜	luó bo	radish, turnip	củ cải, cà rốt
贷款	dài kuǎn	loan	khoản cho vay, tiền vay
告别	gào bié	say good-bye	từ biệt, tạm biệt
热情	rè qíng	enthusiasm	nhiệt tình, hăng hái
模拟	mó nǐ	imitate, simulate	mô phỏng
针灸	zhēn jiǔ	acupuncture and moxibustion	châm cứu
便饭	biàn fàn	simple meal, potluck	bữa ăn đơn giản
精彩	jīng cǎi	excellent, brilliant	tuyệt vời; xuất sắc
收拾	shōu shi	tidy	thu dọn, ngăn nắp
幸亏	xìng kuī	fortunately, luckily	may thay, may mắn

3. Online Chinese character reading test instructions

汉语字词认读在线测试说明

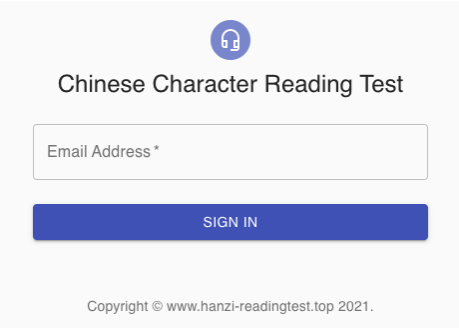
Hướng dẫn kiểm tra trực tuyến nhận dạng từ tiếng Trung

Hướng dẫn sử dụng:

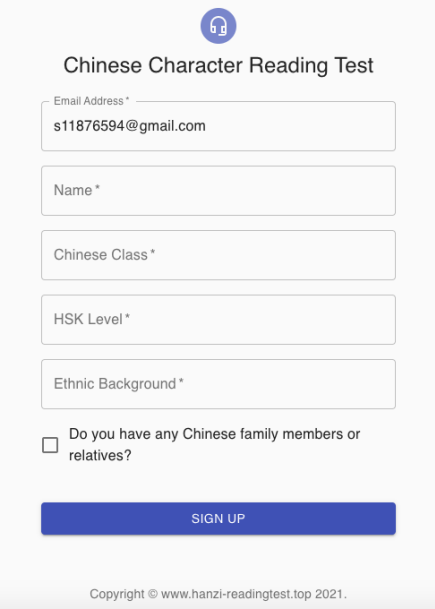
1. Vui lòng kiểm tra trong môi trường yên tĩnh. Bài kiểm tra gồm 100 chữ Hán và 108 từ, cần khoảng 40 phút. Thông tin bạn cung cấp trong phiếu trả lời sẽ được bảo mật nghiêm túc, sẽ không tiết lộ cho bên thứ ba, và chúng tôi cũng sẽ không gửi cho bạn bất kỳ thông tin không liên quan nào. Cảm ơn bạn đã tham gia!

2. Nhấp vào liên kết hoặc nhập địa chỉ web trên máy tính hoặc điện thoại (gợi ý sử dụng trình duyệt Chrome) https://www.hanzi-readingtest.top/info

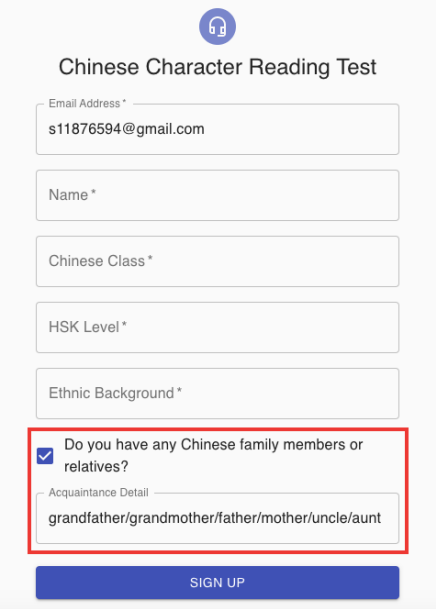
3. Hãy nhập địa chỉ email, như hình sau.



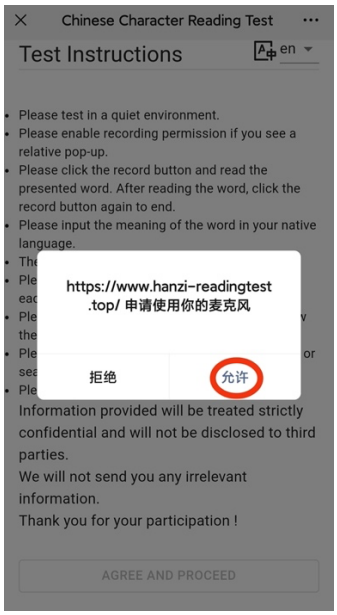
4. Sau khi đăng nhập, hãy nhập theo thứ tự tên, lớp tiếng Trung, trình độ tiếng Trung, dân tộc, hiện nay còn người thân ở Trung Quốc không, như hình sau.

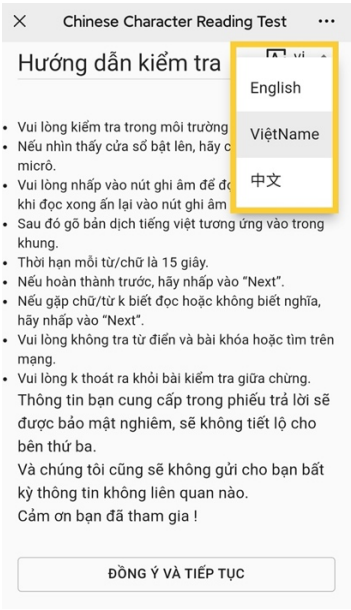


Cột cuối cùng, nếu còn người thân ở Trung Quốc thì đánh dấu tích và xin nói rõ mối quan hệ. Nếu không còn họ hàng ở Trung Quốc, thì không chọn.



5. Nếu nhìn thấy cửa sổ bật lên, hãy cho phép sử dụng micrô, đọc hướng dẫn, sau đó nhấp vào "Đồng ý và Tiếp tục", như được hiển thị bên dưới.





6. Bắt đầu đọc từng từ/chữ xuất hiện lần lượt trên màn hình.

(1) Vui lòng nhấp vào nút ghi âm để đọc từ/chữ, sau khi đọc xong ấn lại vào nút ghi âm để kết thúc, sau đó gõ bản dịch tiếng Việt tương ứng vào trong khung, thời hạn mỗi từ/chữ là 15 giây.

(2) Nếu hoàn thành trước, hãy nhấp vào “NEXT”.

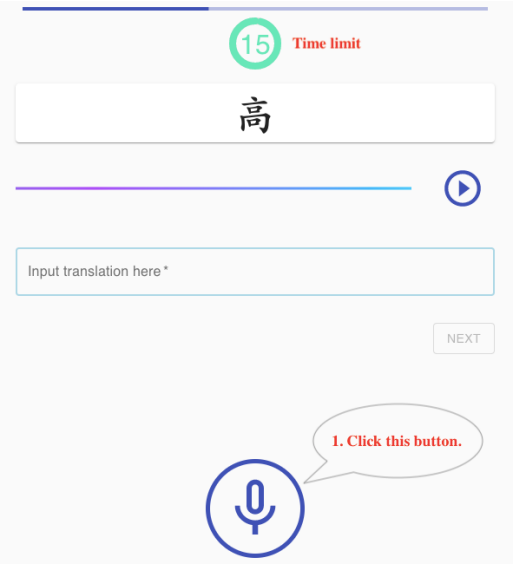
(3) Nếu gặp chữ/từ k biết đọc hoặc không biết nghĩa, hãy nhấp vào “NEXT”.

(4) Vui lòng không tra từ điển và bài khóa hoặc tìm trên mạng.

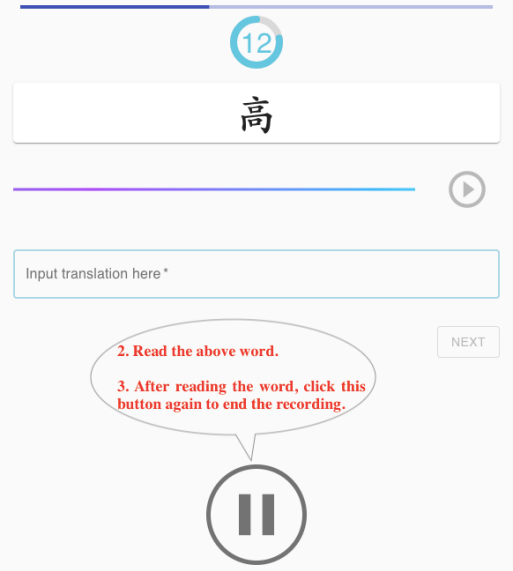
(5) Vui lòng k thoát ra khỏi bài kiểm tra giữa chừng.

Như hình a, b, c:

a.



b.



c.

Test instructions in English

User Guides:

1. Please take the test in a quiet environment. The test contains 100 Chinese characters and 108 words and may take around 40 minutes. The information you provide in the answer sheet

will be kept strictly confidential and will not be disclosed to third parties, nor will we send you any irrelevant information. Thank you for your participation!

2. On a computer or phone, click this link or enter the URL (Chrome is recommended).

3. Please enter your email address, as shown below.

4. After logging in, please fill in your name, Chinese class, HSK level, ethnicity, and whether you have Chinese relatives in sequence, as shown in the figure below.
In the last column, if you have Chinese relatives, please tick and explain; if no Chinese relatives, do not tick.

5. If you see a pop-up, please enable recording permission, read the instructions, and click "Agree and Proceed" as shown below.

6. Start to read the Chinese characters/words appearing on the screen one by one.
(1) Please click the record button and read the presented Chinese character/word. After reading it, click the record button again to end. Then, please input the Vietnamese meaning of that Chinese character/word. The time limit for each item is 15 seconds.
(2) Please click the "NEXT" button after completing each word.
(3) Please click the "NEXT" button if you do not know the word.
(4) Please do not consult the dictionary & textbooks or search the word online.
(5) Please do not quit before completion.

As shown below a, b, c.

Appendix B Chinese learning questionnaire

汉语学习问卷

Bảng câu hỏi học tiếng Trung

我们现邀请各位越南大学生朋友填写一份有关汉语学习的调查问卷，您可以扫描图片中的二维码或点击该链接进入问卷。感谢您对本研究的大力支持！

Bây giờ chúng tôi mời các bạn sinh viên đại học Việt Nam điền vào bảng câu hỏi khảo sát học tiếng Trung, bạn có thể quét mã Qr trong hình hoặc nhấp vào liên kết để vào bảng câu hỏi. Cảm ơn bạn đã hỗ trợ việc nghiên cứu của này!

https://www.wjx.cn/vj/P2dvFA7.aspx

问卷说明：本问卷旨在考察越南大学生的汉语学习情况。问卷分为三个部分：背景信息、汉语学习动机、以及有关课堂教学和教材看法的开放式问题。请根据您的真实情况来填写问卷。您的个人信息将被严格保密。感谢您的参与！

Mô tả bảng câu hỏi: Mục đích của bảng câu hỏi này là khảo sát tình hình học tiếng Trung của sinh viên đại học Việt Nam. Bảng câu hỏi được chia thành ba phần: thông tin cơ bản, động cơ

học tiếng Trung và các câu hỏi mở về giảng dạy trên lớp và tài liệu giảng dạy. Vui lòng điền vào bảng câu hỏi dựa trên tình hình thực tế của bạn. Thông tin cá nhân của bạn sẽ được bảo mật. Cảm ơn bạn đã tham gia!

I. 背景信息 Thông tin bối cánh

A. 基本信息 Thông tin cơ bản

姓名 Họ tên

邮箱地址 Địa chỉ email

就读大学 Đại học

专业 Chuyên ngành

学年 Năm học

中文班级 Lớp tiếng Trung

HSK 汉语水平 Trình độ tiếng Trung

会说的语言 Các ngôn ngữ có thể nói được

民族 Dân tộc

性别： 男 女

Giới tính: Nam Nữ

年龄范围： 18-24 25-30

Phạm vi tuổi tác: 18-24 25-30

有无中国家庭成员 Có thành viên gia đình người Trung không:

无　母亲　父亲　奶奶/外婆　爷爷/外公　其他亲戚

Không　Mẹ (Má)　Bố (Ba)　Bà nội/Bà ngoại　Ông nội/Ông ngoại　Người thân khác

B. 中文学习经历 Kinh nghiệm học tiếng Trung

1、你在大学学习汉语多久了？

Bạn học tiếng Trung trong trường đại học bao lâu rồi?

2、你一周有几节中文课？

Một tuần bạn có mấy tiết học tiếng Trung?

3、你已经上了多少节中文课了？

Bạn đã học mấy tiết học tiếng Trung rồi?

4、你学了多少个汉字？

Bạn học được bao nhiêu chữ Hán rồi?

5、你是从什么时候开始学习中文的？

Bạn bắt đầu học tiếng Trung khi nào?

6、上大学前你是否学过汉语？

Trước khi học đại học bạn đã từng học tiếng Trung chưa?

7、上大学前你学了多长时间的汉语？

Trước khi học đại học bạn học tiếng Trung bao lâu?

8、你去过中国吗？

Bạn đã đi Trung Quốc chưa?

C. 参加课外汉语活动的频率（请选择合适的选项）

Tần suất tham gia các hoạt động ngoại khóa tiếng Trung (vui lòng chọn tùy chọn thích hợp)

从不　很少　有时　经常　通常　总是

không bao giờ　hiếm khi　đôi khi　thường xuyên　thông thường　luôn luôn

1、你和家人或朋友说汉语吗？

Bạn có nói tiếng Trung với gia đình hoặc bạn bè của mình không?

2、你在空闲时间看中文电视节目吗？

Bạn có xem các chương trình truyền hình Trung Quốc vào thời gian rảnh không?

3、你在空闲时间听中文歌吗？

Bạn có nghe các bài hát tiếng Trung vào thời gian rảnh không?

4、你在空闲时间去中国城或中国市场吗？

Bạn có đi đến khu phố Tàu hoặc chợ người Hoa vào thời gian rảnh không?

5、你在课后看中文书吗？

Bạn có đọc sách tiếng Trung sau giờ học không?

6、你在课后练习写汉字吗？

Bạn có luyện viết chữ Hán sau giờ học không?

II. 汉语学习动机 Động lực học tiếng Trung (phổ thông)

你在多大程度上同意/不同意下列说法？请选择最能代表你想法的数字（从 1 到 6，1=非常不同意，6=非常同意）。

Bạn đồng ý / không đồng ý với những nhận định sau ở mức độ nào? Vui lòng chọn con số thể hiện tốt nhất suy nghĩ của bạn (từ 1 đến 6, 1 = rất không đồng ý, 6 = rất đồng ý).

1、汉语（普通话）对我将来的职业非常有用。

Tiếng Trung (phổ thông) rất có ích với nghề nghiệp tương lai của tôi.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

2、为了得到社会的认可，学习汉语对我来说很重要。

Để được xã hội công nhận, thì việc học tiếng Trung đối với tôi là rất quan trọng.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

3、学习汉语对我来说很重要，因为我认为我将来的学习需要它。

Học tiếng Trung rất quan trọng đối với tôi, vì tôi nghĩ tôi cần nó cho việc học sau này của mình.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

4、我期待上汉语课。

Tôi mong muốn được học tiếng Trung.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

5、学习汉语对我来说很重要，因为我计划出国留学。

Học tiếng Trung rất quan trọng đối với tôi, vì tôi dự định đi du học.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

6、我不得不学习汉语，否则，我想我的父母将会对我失望的。

Tôi không thể không học tiếng Trung, nếu không, tôi nghĩ bố mẹ sẽ rất thất vọng về tôi.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

7、我准备在学习汉语方面付出很多努力。

Tôi chuẩn bị phải cố gắng rất nhiều trong việc học tiếng Trung.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

8、为了得到同龄人的认可，学习汉语对我来说很重要。

Để được các bạn đồng trang lứa công nhận thì việc học tiếng Trung đối với tôi là rất quan trọng.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

9、我学习汉语是因为我最好的朋友认为它很重要。

Tôi học tiếng Trung vì bạn thân của tôi cho rằng nó rất quan trọng.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

10、我想学习汉语，即使不是必须的。

Tôi muốn học tiếng Trung, ngay cả khi nó không cần thiết.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

11、为了得到家人的认可，学习汉语对我来说很重要。

Để được gia đình công nhận, việc học tiếng Trung đối với tôi rất quan trọng.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

12、我能想象自己将来可以成功地用普通话向公众发表演讲。

Tôi có thể tưởng tượng trong tương lai tôi có thể trình bày bài phát biểu thành thạo bằng tiếng phổ thông trước công chúng.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

13、我真的很喜欢学习汉语的过程。

Tôi thực sự thích quá trình học tiếng Trung.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

14、学习汉语对我来说很重要，为了实现自己的重要目标（例如：获得学位或奖学金）。

Việc học tiếng Trung đối với tôi rất quan trọng, để thực hiện mục tiêu quan trọng của bản thân (ví dụ: đạt được bằng cấp hoặc học bổng).

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

15、为了得到老师的认可，学习汉语对我来说很重要。

Để được giáo viên công nhận, việc học tiếng Trung đối với tôi rất quan trọng.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

16、学习汉语对我来说很重要，因为如果我掌握好了汉语，我的生活将会发生改变。

Học tiếng Trung rất quan trọng đối với tôi, vì nếu tôi thành thạo tiếng Trung, cuộc đời tôi sẽ thay đổi.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

17、我将来想如何使用汉语的梦想和我父母的一样。

Ước mơ của tôi về cách sử dụng tiếng Trung trong tương lai giống như ước mơ của bố mẹ.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

18、我发现学习汉语非常有趣。

Tôi thấy việc học tiếng Trung rất thú vị.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

19、我能够想象这样一种情形：我与中国人做生意说普通话。

Tôi có thể tưởng tượng một tình huống: tôi nói tiếng phổ thông khi làm ăn với người Trung Quốc.

非常不同意 rất không đồng ý 1　2　3　4　5　6 非常同意 rất đồng ý

20、我认为学习汉语比学习其他科目时间过得快。

Tôi nghĩ học tiếng Trung thời gian trôi nhanh hơn học môn khác.

非常不同意 rất không đồng ý 1　2　3　4　5　6 非常同意 rất đồng ý

21、我认为学习汉语很重要，因为我尊敬的人认为我应该那么做。

Tôi nghĩ việc học tiếng Trung rất quan trọng, bởi vì những người tôi tôn trọng đều nghĩ rằng tôi nên làm như vậy.

非常不同意 rất không đồng ý 1　2　3　4　5　6 非常同意 rất đồng ý

22、我的汉语学习得到了说普通话同学的支持。

Việc học tiếng Trung của tôi được các bạn nói tiếng phổ thông hỗ trợ.

非常不同意 rất không đồng ý 1　2　3　4　5　6 非常同意 rất đồng ý

23、我的父母鼓励我到说汉语的国家或地区寻求留学或工作的机会。

Cha mẹ tôi khuyến khích tôi tìm kiếm cơ hội đi du học hoặc làm việc tại các quốc gia hoặc khu vực nói tiếng Trung Quốc.

非常不同意 rất không đồng ý 1　2　3　4　5　6 非常同意 rất đồng ý

24、学习汉语对我来说很重要，因为汉语是世界上说得最多的语言之一。

Học tiếng Trung rất quan trọng đối với tôi, bởi vì tiếng Trung là một trong những ngôn ngữ được nói nhiều nhất trên thế giới.

非常不同意 rất không đồng ý 1　2　3　4　5　6 非常同意 rất đồng ý

25、我的兄弟姐妹或亲戚在学习汉语普通话。

Anh chị em hoặc họ hàng của tôi đang học tiếng phổ thông.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

26、即使我的汉语学习不及格，我仍会努力学习这门语言。

Ngay cả khi việc học tiếng Trung của tôi không đạt chuẩn, tôi vẫn sẽ học ngôn ngữ này một cách chăm chỉ.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

27、当我在学习汉语时，我能感受到来自父母的巨大压力。

Khi tôi đang học tiếng Trung Quốc, tôi có thể cảm thấy áp lực rất lớn từ bố mẹ.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

28、学习汉语对我来说很重要，因为汉语是世界上重要的语言之一。

Học tiếng Trung rất quan trọng đối với tôi, bởi vì tiếng Trung là một trong những ngôn ngữ quan trọng nhất trên thế giới.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

29、我能想象自己在将来可以使用普通话进行讨论。

Tôi có thể tưởng tượng trong tương lai tôi có thể sử dụng tiếng phổ thông trong các cuộc thảo luận.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

30、我真的很喜欢学习汉语。

Tôi thực sự rất thích học tiếng Trung.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

31、我能想象自己在一所所有课程都用普通话教授的大学里学习。

Tôi có thể tưởng tượng mình đang học trong một trường đại học, nơi tất cả các khóa học đều được dạy bằng tiếng phổ thông.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

32、学习汉语对我来说很重要，因为中国在经济上越来越重要。

Học tiếng Trung Quốc rất quan trọng đối với tôi, bởi vì Trung Quốc ngày càng trở nên quan trọng hơn về mặt kinh tế.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

33、我有很好的中文老师帮助我的汉语学习。

Tôi có những giáo viên tiếng Trung rất giỏi giúp tôi học tiếng Trung.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

34、我愿意花费大量的时间学习汉语。

Tôi sẵn sàng dành nhiều thời gian để học tiếng Trung.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

35、学习汉语对我来说很重要，因为中国在世界上扮演着重要的角色。

Học tiếng Trung rất quan trọng đối với tôi, bởi vì Trung Quốc đóng một vai trò quan trọng

trên thế giới.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

36、我能想象自己住在一个说汉语的国家，并且可以有效地使用普通话与当地人交流。

Tôi có thể tưởng tượng rằng tôi đang sống ở một quốc gia nói tiếng Trung và có thể giao tiếp hiệu quả với người dân địa phương bằng tiếng phổ thông.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

37、如果我的中文老师给全班布置一个选做作业，我肯定会自愿去做。

Nếu giáo viên tiếng Trung của tôi giao một bài tập về nhà tùy chọn cho lớp, tôi nhất định sẽ tự nguyện làm.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

38、我将来想如何使用汉语的印象主要是受我父母的影响。

Ấn tượng của tôi về cách sử dụng tiếng Trung trong tương lai chủ yếu bị ảnh hưởng bởi cha mẹ tôi.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

39、我能想象自己和朋友或同事用普通话交流。

Tôi có thể tưởng tượng mình đang giao tiếp bằng tiếng phổ thông với bạn bè hoặc đồng nghiệp.

非常不同意 rất không đồng ý 1 2 3 4 5 6 非常同意 rất đồng ý

40、如果将来有汉语（普通话）课程，我愿意参加。

Nếu có các khóa học tiếng Trung (tiếng phổ thông) trong tương lai, tôi muốn tham gia.

非常不同意 rất không đồng ý 1　2　3　4　5　6 非常同意 rất đồng ý

III. 开放式问答 Câu hỏi dạng mở

请详细回答下列问题，并举例说明。你可以使用越南语或汉语作答。

Vui lòng trả lời chi tiết các câu hỏi sau và đưa ra ví dụ. Bạn có thể trả lời bằng tiếng Việt hoặc tiếng Trung.

1、你如何看待课堂上的汉字教学部分呢？可以举例说明吗？

Bạn nghĩ gì về phần dạy chữ Hán trên lớp? Có thể lấy ví dụ minh họa không?

2、你觉得你的老师教汉字和生词的方式怎么样？可以举例说明吗？

Bạn nghĩ gì về cách giáo viên của bạn dạy chữ Hán và từ mới? Có thể lấy ví dụ minh họa không?

3、你最喜欢和最不喜欢的汉字教学内容分别是什么？为什么呢？

Nội dung dạy chữ Hán yêu thích nhất và ít yêu thích nhất của bạn là gì? Tại sao?

4、你如何看待课本中的汉字学习部分呢？可以举例说明吗？

Bạn nghĩ gì về phần học Hán tự trong sách giáo khoa? Có thể lấy ví dụ minh họa không?

5、从学习字词的角度，你如何评价你们的教材和练习册？它们对你学习中文字词的帮助大吗？

Ở góc độ học từ, bạn đánh giá sách giáo khoa và sách bài tập của mình như thế nào? Chúng có hữu ích cho bạn trong việc học các ký tự và từ tiếng Trung không?

结束 Kết thúc

谢谢！Cảm ơn!

Chinese learning questionnaire (in English)

We are inviting Vietnamese college students to fill out a questionnaire about Chinese language learning. You can scan the QR code in the picture or click the link to enter the

questionnaire. Thank you for your great support of this research!

Questionnaire instruction: This questionnaire aims to investigate the Chinese language learning of Vietnamese college students. It consists of three parts: background information, motivation to learn Chinese, and open-ended questions about your views on classroom teaching and textbooks. Please fill in the questionnaire according to your real situation. Your personal information will be kept strictly confidential. Thank you for your participation!

I. Background Information

A. Demographic information

Name: _____

Email address: _____

University: _____

Major: _____

Year of study: _____

Chinese class: _____

HSK level: _____

Languages you can speak: _____

Ethnic group: _____

Gender: Male Female

Age range: 18-24 25-30

Chinese family members:

○ none ○ mother ○ father ○ grandmother ○ grandfather ○ other relatives _____

B. Chinese learning experience

1. How long have you been studying Chinese at your university? _____

2. How many Chinese classes do you have in a week? _____

3. How many Chinese classes have you had? _____

4. How many Chinese characters have you learned? _____

5. When did you start to learn Chinese? _____

6. Did you learn Chinese before entering university? _____

7. How long had you learned Chinese before entering university? _____

8. Have you been to China? _____

C. Frequency of attending extracurricular Chinese activities (Please choose the appropriate option)

never seldom sometimes often usually always

1. Do you speak Chinese with your family/ friends?

2. Do you watch Chinese TV programs in your free time?

3. Do you listen to Chinese songs in your free time?

4. Do you go to the China town or the Chinese market in your free time?

5. Do you read Chinese books after class?

6. Do you write Chinese characters after class?

II. Chinese (Mandarin) learning motivation

Please see the L2 Chinese Motivational Self System Scale for CFL and CHL learners in Lin (2018, pp. 83-86).

III. Open-ended questions

Please answer the following questions in detail and give examples. You can answer in either Vietnamese or Chinese.

1. What do you think of the Chinese character teaching section in your class? Could you please specify with examples?

2. What do you think of the way that your teacher teaches you the new Chinese characters and words? Could you please give some examples?

3. What is your favorite and least favorite Chinese character teaching content? And why?

4. What do you think of the Chinese character learning section in your textbooks? Could you please specify with examples?

5. In terms of learning Chinese characters and words, how do you evaluate the textbooks and workbooks? Are they helpful to your Chinese character and word learning?

The End.

Thank You!